

Tingkah Laku Pembelian Mahasiswa Institusi Pengajian Tinggi dalam Jualan Secara Langsung di Aplikasi Tiktok

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CONSUMER DEMAND FOR SUGAR-SWEETENED BEVERAGES IN MALAYSIA: EVIDENCE FROM BRAND AND LIFESTYLE FACTORS

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Abstract

Obesity, diabetes, and other non-communicable diseases (NCDs) remain pressing public health issues in Malaysia, with excessive sugar intake, particularly from sugar-sweetened beverages (SSBs), identified as a major contributor. In 2019, the government introduced an excise tax on SSBs to curb consumption, yet intake levels remain high. This persistent demand indicates that taxation alone is insufficient, and that other underlying drivers of SSB_s consumption must be considered. This study examines the determinants of SSB_s consumption across Malaysia using data from 428 respondents collected through a cross-sectional survey. Multiple regression analysis was used to identify the influence of external and individual factors on SSB_s intake. The results show that brand and lifestyle are significant determinants of SSB_s consumption, at the 10% and 1% significance levels, respectively. Specifically, stronger brand perception is positively associated with higher SSB_s intake, with each unit increase in perception score linked to a 3.437 unit rise in consumption, while lifestyle factors are associated with an increase of 5.871 units in consumption. In contrast, promotion and accessibility were not significant predictors. These findings highlight the need for public health interventions that go beyond taxation, emphasizing healthier lifestyle practices and reducing brand-driven demand through regulation, education, and promotion of healthier alternatives.

Keywords: Sugar-sweetened beverages (SSBs), consumption, brand, lifestyle, behavior.

Abstrak

Obesiti, diabetes dan penyakit tidak berjangkit (NCD) lain masih menjadi isu kesihatan awam yang membimbangkan di Malaysia, salah satu penyumbang utama ialah pengambilan gula berlebihan terutamanya daripada minuman manis bergula (SSB_s). Pada tahun 2019, kerajaan telah memperkenalkan cukai eksais terhadap SSB_s bagi mengurangkan penggunaannya, namun tahap pengambilan masih kekal tinggi. Permintaan yang berterusan ini menunjukkan bahawa pelaksanaan cukai

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sahaja tidak mencukupi, dan faktor lain yang mempengaruhi pengambilan SSB_s perlu dipertimbangkan. Kajian ini meneliti penentu kepada pengambilan SSB_s di Malaysia menggunakan data daripada 428 orang responden melalui kaedah tinjauan keratan lintang. Analisis regresi berganda digunakan untuk mengenal pasti pengaruh faktor luaran dan individu terhadap pengambilan SSB_s. Dapatan kajian menunjukkan bahawa jenama dan gaya hidup merupakan penentu signifikan kepada pengambilan SSB_s, pada aras signifikan 10% dan 1% masing-masing. Secara khusus, jenama yang lebih kukuh didapati berkait positif dengan peningkatan pengambilan SSB_s, di mana setiap peningkatan satu unit skor jenama dikaitkan dengan peningkatan sebanyak 3.437 unit dalam penggunaan, manakala faktor gaya hidup dikaitkan dengan peningkatan sebanyak 5.871 unit dalam penggunaan. Sebaliknya, promosi dan mudah didapati tidak menunjukkan hubungan yang signifikan. Dapatan ini menekankan keperluan intervensi kesihatan awam yang melangkaui pelaksanaan cukai, dengan memberi tumpuan kepada amalan gaya hidup sihat serta pengurangan pengaruh jenama melalui peraturan, pendidikan, dan promosi alternatif yang lebih sihat.

Kata kunci: *Minuman manis bergula (SSBs), penggunaan, jenama, gaya hidup, tingkahlaku.*

Introduction

Sugar-sweetened beverages (SSBs) are drinks that contain added sugars, either in natural form or as sweeteners, which provide sweetness and extra calories without nutritional value. These sugars may take the form of sucrose, glucose, fructose, lactose, maltose, and others (Royal Malaysian Customs Department, 2024). Common examples of SSBs include sodas, fruit juices, energy drinks, and flavored beverages, with Coca-Cola, Pepsi, and Red Bull being popular among Malaysians. Excessive intake of these drinks is strongly linked to obesity, diabetes, and other non-communicable diseases (NCDs). The World Health Organization (WHO) highlights a close association between free sugar consumption, particularly from ready-to-drink beverages such as carbonated soft drinks, and unhealthy weight gain. Free sugars include sugars added to food and drinks as well as those naturally present in fruit juices, smoothies, purees, honey, syrups, and nectars. In children, frequent intake of SSBs has also been linked to weight gain. The National Health and Morbidity Survey (NHMS, 2024) reported that 28% of children aged 5–19 years in Malaysia were overweight or obese, underscoring the urgency of addressing SSB_s consumption as both a dietary and a public health issue.

Unhealthy dietary practices, particularly excessive sugar intake, remain a major driver of Malaysia's rising obesity and diabetes rates. In 2019, the government introduced an excise tax on SSBs to reduce consumption. While this was an important step, taxation alone may not be enough. Understanding the factors that influence

consumer demand is essential to designing effective interventions. The Ministry of Health Malaysia (2023) estimates that up to 80% of health outcomes are shaped by socioeconomic status, physical environment, and health behaviors. Likewise, WHO (2018) identifies diets high in fat and sugar, combined with low physical activity, as leading causes of obesity and overweight. This highlights the central role of lifestyle and environment in shaping beverage choices. From an economic standpoint, three key factors influence demand: income, market availability, and advertising (Wu, 2023). Higher income increases purchasing power, while market conditions such as price and product availability shape choices, including substitution between beverages. Advertising, especially in the beverage sector, also drives product awareness and consumer preferences.

Sociodemographic factors add another layer of influence. Age, gender, education, ethnicity, marital status, household size, and place of residence all affect dietary patterns. For example, Cheah et al. (2023) found that older individuals spend more on sugar-rich foods and drinks compared to younger groups, while Ghazaryan et al. (2023) reported that consumers aged 40–59 allocate higher expenditures to SSBs and bottled water. Lower education, rural residence, and marital status have also been linked to higher sugar consumption (Cheah et al., 2023). Lifestyle practices play a further role. Studies consistently show that unhealthy habits, including poor diets and low physical activity, are strongly associated with higher SSBs consumption (Cheah et al., 2023; Gan, Mohamed & Law, 2019; Salleh et al., 2021). Among adolescents, this has been linked to adverse health outcomes, prompting calls for lifestyle-focused interventions (Gan et al., 2019).

Despite these findings, empirical evidence on how demand-side factors drive SSBs consumption in Malaysia is still limited. This study addresses that gap by examining the influence of brand perception, promotion, accessibility, and lifestyle on SSBs demand. The results provide insights into consumer behaviour and contribute to the development of more effective health and fiscal policies.

Literature Review

The rising prevalence of obesity is a critical public health issue that affects all age groups, including children, adolescents, adults, and the elderly. One of the main contributors is the excessive intake of unhealthy foods and beverages, particularly those high in sugar and calories. According to Arifani and Setyaningrum (2021), statistical analysis using the Chi-Square test revealed a significant relationship ($p < 0.05$) between the consumption of sweet foods, sugar-sweetened beverages (SSBs), soft drinks, and fast food with obesity among adults. Obesity is often attributed to various factors such as genetics, behavior, environment, psychology, social and cultural influences, which collectively lead to energy imbalance and fat accumulation (Nasir et al., 2021; Arifani & Setyaningrum, 2021). Similarly, Luthfianto & Suprihadi

(2017) emphasized lifestyle as a determinant of individual behavior, where food choices, recreation, and daily routines reflect health attitudes.

Lifestyle, as highlighted by Arifani and Setiyaningrum (2021), can be categorized under behavioral factors, whereby unhealthy eating habits and insufficient physical activity contribute significantly to obesity. An imbalance between energy intake and expenditure is a major cause of overweight and obesity. Modern consumers often prefer low-cost, energy-dense foods that are widely accessible. The increasing availability of fast-food outlets, convenience stores, and eateries further encourages outside dining, with fast food becoming a popular choice due to its convenience. However, these foods are typically high in calories but low in nutritional value, resulting in negative health outcomes. Branding is another important factor influencing consumer choices. A brand serves as a distinguishing dimension that sets a product or service apart from others that meet the same needs (Keller, 2013; Kotler et al., 2016). Strong branding creates a positive image, builds consumer trust, and fosters brand loyalty (Shahid, Hussain, & Zafar, 2017). Consumers are more likely to select products with familiar brands, perceiving them as more reliable. Cavanagh and Forestell (2013) further demonstrated that healthy food brands influence consumer perception, especially among individuals with strong dietary self-control. Brand perception, therefore, becomes an important determinant of consumption decisions, shaped by visual design, advertising, and social influences.

Advertising plays a critical role in shaping consumer demand curves by enhancing the perceived value of branded products. Becker and Murphy (1993) argued that advertising increases consumers' willingness to pay, flattens demand curves, lowers equilibrium prices, and increases the quantity demanded. Likewise, Erdem et al. (2006) confirmed that establishing brand credibility effectively influences consumer purchasing behavior. Promotion, as a form of marketing communication, also plays a central role in attracting consumers (American Marketing Association, 2024; Familmaleki et al., 2015; Lupiyoadi & Hamdani, 2006). Saleem & Abideen (2011) highlighted that advertising not only raises awareness but also creates emotional connections with consumers, leaving long-lasting impressions that reinforce brand loyalty and purchase decisions. In summary, existing literature suggests that obesity and SSB_s consumption are influenced by lifestyle choices, food accessibility, branding, advertising, and promotional strategies. These factors collectively shape consumer demand and provide important insights for analyzing beverage consumption patterns.

Utility Theory

Utility is often regarded as a measure of consumer satisfaction or happiness derived from consumption choices. According to classical economic theory, individuals are assumed to make consumption decisions to maximize utility within their budget

constraints. In the context of sugar-sweetened beverages (SSBs), consumers may derive satisfaction from the sweetness, taste, or temporary energy boost provided by these products, even though such choices carry potential long-term health risks. The concept of marginal utility is central in explaining consumption patterns. Consumers continue to consume SSBs as long as the additional satisfaction (marginal utility) gained from each unit exceeds the marginal cost, which includes both monetary costs and potential health consequences. However, the principle of diminishing marginal utility suggests that the incremental satisfaction gained from each additional unit of SSBs decreases over time. At a certain point, additional consumption provides less utility, which naturally limits demand, particularly among more health-conscious individuals.

This theoretical foundation will directly be reflected in the proposed framework, where utility and satisfaction influence purchase decisions and subsequent consumption behavior. Sociodemographic factors and external influences such as brand, promotion, accessibility, and lifestyle further shape consumer behavior, reinforcing the demand for SSBs. Thus, utility theory provides an economic explanation of why consumers continue to purchase and consume SSBs despite awareness of their adverse health effects.

Consumer Behavior Theory

A consumer is an individual engaged in purchasing activities either for personal use or to fulfill the collective needs of the household or family. Consumer behavior refers to the way individuals decide to allocate their available resources, such as money, effort, and time, to acquire and consume various goods and services. This includes what they buy, why they buy it, when and where they make the purchase, how often they buy it, and how frequently they use it. The actions taken by an individual in purchasing and using a product or service, including the mental and social processes that precede and follow these actions, are also part of consumer behavior. According to Schiffman and Kanuk (1987), consumer behavior can be defined as the activities that consumers undertake when searching for, purchasing, using, evaluating, and disposing of products, services, or ideas to satisfy their needs. It is essentially the way individuals act when obtaining and utilizing goods and services. Consumer behavior involves decision-making processes that are influenced by personal characteristics as well as environmental factors. Since it is a broad and complex subject, understanding consumer behavior is not an easy task. For this reason, the concept has been widely studied by marketers in order to influence consumer decisions and shape purchasing behavior in the desired direction.

Several components play an important role in understanding consumer behavior and the decision-making process, namely individual differences, environmental influences, and psychological processes. Within the category of individual

differences, five major factors are commonly highlighted as influencing consumer behavior. First, consumer resources such as time, money, and the ability to process information are critical in shaping decision-making. Second, knowledge refers to the information and understanding that consumers hold regarding products, brands, and markets. In other words, knowledge represents the stored information in memory that enables consumers to recognize, evaluate, and develop awareness of products, determining whether they provide benefits or not. Third, attitudes reflect consumers' evaluations and feelings toward specific products, brands, or attributes. Fourth, motivation represents the driving force that compels consumers to act and make purchasing decisions. Finally, personality, values, and lifestyle encompass individual characteristics, core values, and lifestyle choices, all of which significantly influence consumer preferences and behavior (Wanjia, 2014; Gajjar, 2013). Together, these factors interact with environmental and psychological processes, offering a comprehensive framework to explain how consumers form decisions and preferences.

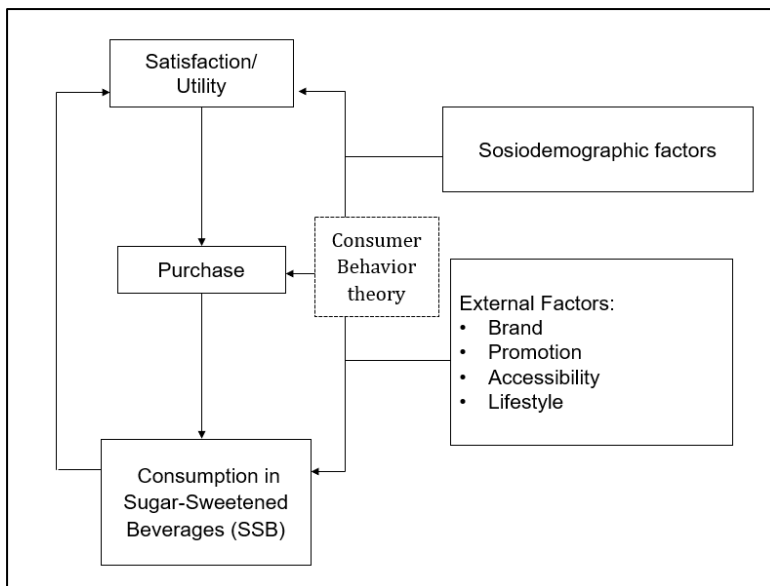


Figure 1: Theoretical Framework

Figure 1 shows a theoretical framework that integrates utility theory and consumer behavior theory to explain the determinants of sugar-sweetened beverage (SSB_s) consumption. According to utility theory, individuals make purchasing decisions based on the satisfaction or utility they derive, constrained by their available resources. SSBs often provide immediate pleasure due to their sweetness, taste, and energizing effects, which encourage consumption despite long-term health risks. However, purchasing behavior cannot be explained by utility alone. Consumer

behavior theory emphasizes that decisions are also shaped by psychological, social, and environmental influences. In this context, sociodemographic factors such as age, gender, education, and income may influence perceptions and consumption levels, while external factors such as brand image, promotional activities, accessibility, and lifestyle play a significant role in shaping preferences and choices. For instance, branding can create strong associations with enjoyment or social identity, promotion can increase visibility and desirability, accessibility determines ease of purchase, and lifestyle reflects broader patterns of health awareness or indulgence. Together, these theories provide a holistic framework to explain how both rational satisfaction seeking and behavioral influences drive the purchase and consumption of SSBs in Malaysia.

Methodology

A cross-sectional quantitative design was adopted to examine the determinants of sugar-sweetened beverage (SSB_s) consumption in Malaysia. Data were collected from a total of 428 Malaysian residents aged 15 years and above. Participants self-reported their height and weight, which were used to calculate body mass index (BMI) in kg/m². SSB_s consumption was measured based on weekly intake (liters per week) to minimize recall bias.

Study Design and Population

The study population consisted of Malaysian residents from all 13 states and three federal territories. Stratified random sampling was employed, with states serving as strata to ensure national representation. The sampling frame covered Malaysians aged 15 years and above, consistent with the legal minimum working age under the Employment Act (Ministry of Human Resources, 2022). Population data were obtained from the Government of Malaysia (2023). The sample size of 428 respondents was determined using Slovin's formula, which provides an efficient estimate when population variance is unknown, but the total population is known. Stratified random sampling was then applied by state to ensure proportional representation across Malaysia. Inclusion criteria required respondents to be aged 15 years or older and in receipt of a source of monthly income. Individuals diagnosed with diabetes were excluded to avoid health-condition-related bias.

Data Collection

The questionnaire was hosted online via a Google Form and linked to a Google Sheet for secure data storage. The survey was disseminated using QR-code flyers and social-media posts (Facebook) across state-specific channels. Enumerators were appointed in Sabah and Sarawak to enhance participation in East Malaysia. Respondents reported their SSB_s consumption for the preceding week, including volume and price data.

Variables And Measurement

Key independent variables included brand, promotion, accessibility, and lifestyle factors. Brand perception and lifestyle were scored using Likert scales and treated as continuous variables. The dependent variable was weekly SSB_s consumption in liters. SSBs in this study included fruit and vegetable juices, flavored milk (e.g., strawberry milk, full cream), carbonated and energy drinks, as well as homemade beverages such as sweetened tea and coffee, *sirap bandung*, protein shakes, and *teh ais limau*. Respondents reported their total consumption of these beverages over the previous week. BMI was computed from the self-reported height and weight values.

Data Analysis

Data cleaning and analysis were performed using Stata version 18. Descriptive statistics summarized demographics and consumption patterns. Multiple regression models explored the relationship between the independent determinants and consumption. Statistical significance was set at $p < 0.10$ and $p < 0.01$ levels. The F-statistic and corresponding p-value assessed the overall model fit.

Multiple Linear Regression

Multiple linear regression analysis is a statistical technique that employs multiple independent variables to predict a dependent variable. Based on the survey data, a general multiple linear regression model will be applied to identify significant factors influencing the consumption of SSBs. The model is written as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_k X_k + \varepsilon \quad (1)$$

Where:

Y = dependent variable

X = independent variables

β = coefficients of variables

a = intercept

ε = error term

For this study, the regression model applied is:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad (2)$$

Where:

Y = Total SSB_s consumption

X₁ = Brand

X₂ = Promotion

X₃ = Accessibility

X₄ = Lifestyle

The questionnaire consisted of a set of Likert-scale items designed to measure respondents' perceptions and behaviors toward sugar-sweetened beverages (SSBs).

The items were organized into four key dimensions, which are brand, promotion, accessibility, and lifestyle. For the brand dimension, statements included *“Brand plays an important role in influencing my purchasing decisions”* and *“The variety of food and beverage brands available in the market attracts my interest to try them.”* The promotion dimension was measured through items such as *“Special date promotions or deals influence my purchasing decisions”* and *“The role of influencers in advertising a product has a strong impact on my purchasing decisions.”*

The accessibility dimension was captured using statements like *“Cashless payment makes it easier for me to order food and beverages online”* and *“The strategic location of food and beverage outlets makes it convenient for me to make purchases.”* For the lifestyle dimension, respondents were asked to evaluate statements such as *“I consume sweet foods and beverages as part of my daily life”*, *“Sweet beverages that appear premium, such as Zus Coffee, reflect current trends and influence my purchasing decisions”*, *“I enjoy sweet foods and beverages because of their delicious taste”* and *“The sweet taste in food and beverages provides me with energy and satisfaction.”*

Ethical Considerations

The study received ethical approval from the Human Research Ethics Committee of Universiti Sains Malaysia (JEPeM) under the code: USM/JEPeM/PP/24030259. Respondents provided informed consent via the online form and participated voluntarily. Data were anonymized to protect confidentiality.

Findings

Socio-demographic characteristics

Table 1 summarizes the demographic profile of respondents across Malaysia. Out of 428 respondents, 41.8% were male and 58.2% female. The majority (67.3%) were aged 25–44, followed by 21% aged 45 and above, and 11.7% aged 15–24. A small number of elderly respondents participated, likely due to the online nature of the survey. In terms of ethnicity, Malays formed the majority (78.5%), followed by Chinese (8.9%), and Indians/others (12.6%). Educational background showed that 40.4% held a bachelor's degree, 32.7% had a diploma/STPM or equivalent, and 19.6% attained SPM or below, while only 7.3% reported having a master's or PhD. Income distribution reflected Malaysia's national structure, with 66.6% from the B40 group, 30.4% from M40, and just 3% from T20. Most respondents resided in urban areas (68.5%) compared to rural areas (31.5%).

Looking at household size, over half (51.6%) lived in medium-sized households (5–8 members). Smaller households of 1–4 members made up 44.4%, while only 4%

reported living in large households (more than 8 members). In terms of marital status, a majority were married (56.5%), while the rest were single, divorced, or widowed (43.5%). In terms of health indicators, 44.6% of respondents had a normal BMI, 29.2% were overweight, 18.7% obese, and 7.5% underweight.

On average, respondents were 36.21 years old (SD = 10.73), with a mean monthly income of RM 3,721.33 (SD = 2,774.91) and an average household size of 4.88 members (SD = 2.14).

Table 1: Summarizes the sociodemographic profile of respondents

Sociodemographic profile	(n)	(%)
Gender		
Male	179	41.8
Female	249	58.2
Age		
15-24 years	50	11.7
25-44 years	288	67.3
45 years and above	90	21.0
Ethnicity		
Malay	336	78.5
Chinese	38	8.9
Others/Indian	54	12.6
Level of education		
SPM or below	84	19.6
STPM/ Diploma or equivalent	140	32.7
Bachelor's degree	173	40.4
Master or PhD	31	7.3
Income per month		
B40 (below RM 4,849)	285	66.6
M40 (RM 4,850 – RM 10,959)	130	30.4
T20 (above RM 10,960)	13	3.0
Residency		
Rural	135	31.5
Urban	293	68.5
Marital status		
Single and divorced/widowed	185	43.2
Married	243	56.8
Number of household		
1 to 4 members	190	44.4
5 to 8 members	221	51.6
More than 8 members	17	4.0

Table 1 (continued)

Sociodemographic profile	(n)	(%)
Body Mass Index (BMI)		
Lightweight (less than 18.5kg/cm ²)	32	7.5
Normal (18.5 – 24.9 kg/cm ²)	191	44.6
Overweight (25 – 29.9 kg/cm ²)	125	29.2
Obesity (more than 30kg/cm ²)	80	18.7

SSBs Consumption

The World Health Organization (WHO,2015) recommends that both adults and children limit their daily intake of free sugars to less than 10% of total energy intake, with further health benefits achievable if intake is reduced below 5%, or approximately 25 grams (equivalent to six teaspoons) per day. Table 2 presents the consumption patterns of sugar-sweetened beverages (SSBs) among Malaysians, highlighting the potential challenge in meeting these guidelines. The descriptive analysis reveals that the mean weekly intake of fruit juice was 332 milliliters, consumed by 158 respondents (36.9%). For carbonated drinks, the mean consumption reached 365 milliliters per week, reported by 172 respondents (40.2%). Flavored milk was consumed by 186 respondents, with a mean intake of 333 milliliters per week. Homemade drinks represented the highest intake, with 359 respondents consuming an average of 1,227 milliliters weekly. In comparison, all respondents reported drinking mineral water, with a mean of 1,254 milliliters per week. These figures suggest that while water remains the most consumed beverage, the relatively high intake of SSBs indicates that sugar consumption among Malaysians may still exceed the levels recommended by the WHO.

Table 2: The consumption patterns of SSBs in Malaysia per week

Type of drinks	Min.	Max.	Mean	Standard Dev.	%	n
Fruit juice	0	4.7	0.331729	0.7617626	36.9	158
Carbonated drink	0	3.96	0.3654907	0.6570536	40.2	172
Flavored milk	0	4.5	0.3334112	0.6154711	43.5	186
Homemade drink	0	5.4	1.227383	1.046424	83.9	359
Mineral water	1.4	28	12.54276	5.924912	100	428

Figure 2 illustrates the frequency of SSB_s (Fruit juice, carbonated drink, flavored milk, and homemade drink) consumption among respondents, measured in liters per week. The majority of respondents (63.08%) reported consuming between 0 to 1 liter of SSBs per week. This suggests that while SSB_s consumption is common, most individuals limit their intake to relatively small quantities. Meanwhile, 28.04% of respondents consumed between 1 to 3 liters per week, representing a significant

proportion of moderate consumers. This group may be at a higher risk of excessive sugar intake, depending on the types of beverages consumed and the presence of other dietary sources of sugar. A smaller group, accounting for 8.88%, reported consuming more than 3 liters per week, indicating a heavy consumption pattern. Although this is the smallest category, it is particularly concerning from a public health perspective, as high-volume SSB_s consumption has been strongly associated with obesity, diabetes, and other non-communicable diseases (NCDs).

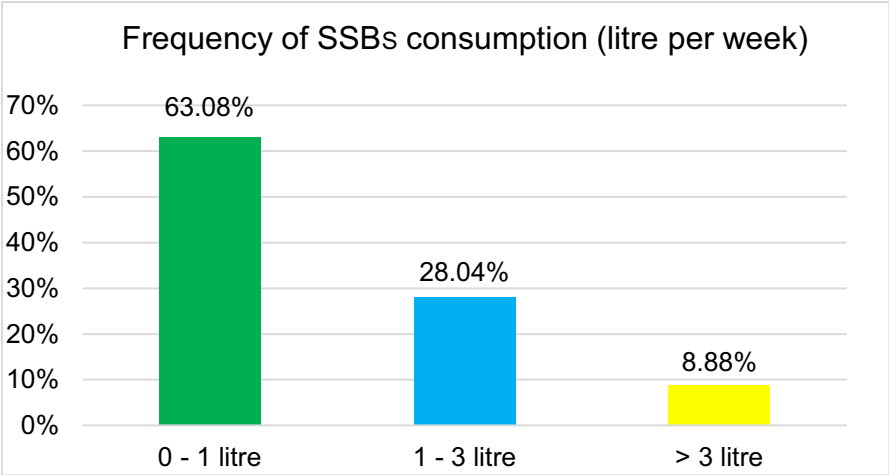


Figure 2: Frequency of SSBs consumption in Malaysia

Interestingly, this pattern is consistent with findings from Bakar et al. (2020), a study among university students in Kuala Nerus, Terengganu, where nearly half of the respondents (49.4%) reported moderate SSB_s consumption, largely attributed to affordability and easy availability on campus. This comparison suggests that while contexts differ, SSB_s consumption remains a widespread behavior influenced by accessibility and price, raising concerns for long-term health. Taken together, both studies highlight the urgency of targeted health interventions, especially for individuals in the moderate and high consumption groups, to bring actual intake closer in line with WHO guidelines. Overall, the distribution highlights that while most respondents consume SSBs at a lower frequency, a notable proportion still engages in moderate to high levels of consumption. These findings emphasize the importance of targeted health interventions, especially for individuals in the higher consumption categories, to reduce health risks associated with excessive sugar intake.

Associations between the SSBs consumption category and demographic factors

Table 3 shows that SSB_s consumption decreases significantly with age. Respondents aged 15–24 years recorded the highest proportion of heavy intake, with 16% consuming more than 3 liters per week. Among individuals aged 25–44 years, 60.4% consumed 0–1 liter, and only 9.4% exceeded 3 liters. The lowest intake levels were observed among participants aged 45 years and above, with 77.8% in the lowest consumption category and only 3.3% reporting intake above 3 liters. Ethnicity demonstrated a statistically significant association with SSB_s consumption ($p < 0.001$). Malay respondents were more likely to be light consumers, with 68.2% reporting 0–1 liter intake, though 9.2% still consumed more than 3 liters per week. In contrast, Chinese respondents were more frequently moderate consumers, with 55.3% in the 1–3 liter category and 36.8% in the 0–1 liter category. Respondents from Indian or other ethnic backgrounds showed a relatively balanced distribution, with 50.0% consuming 0–1 liter, 42.6% consuming 1–3 liters, and 7.4% exceeding 3 liters per week. Besides, household size revealed significant consumption differences. Households with 5–8 members demonstrated the highest proportion of low consumers (70.5%), whereas smaller households (1–4 members) showed a more varied distribution, with 34.7% in the moderate category and 9.5% in the highest category. Although the sample size for households with more than 8 members was relatively small ($n=18$), this group recorded the largest proportion of heavy consumers (16.7%).

Table 3: The associations between SSBs consumption categories and demographic factors

Variable	n	SSBs consumptions			Chi-square value	p
		0 -1 liter n (%)	1 - 3 liter n (%)	> 3 liters n (%)		
Gender						
Male	179	104 (58.1)	55 (30.7)	20 (11.2)	3.8295	0.147
Female	249	166 (66.7)	65 (26.1)	18 (7.2)		
Age						
15-24 years	50	26 (52)	16 (32)	8 (16)	13.8826	0.008***
25-44 years	288	174 (60.4)	87 (30.2)	27 (9.4)		
45 years and above	90	70 (77.8)	17 (18.9)	3 (3.3)		
Ethnicity						
Malay	336	229 (68.2)	76 (22.6)	31 (9.2)	24.8468	0.000***
Chinese	38	14 (36.8)	21 (55.3)	3 (7.9)		
Others/Indian	54	27 (50)	23 (42.6)	4 (7.4)		
Level of education						
SPM or below	84	57 (67.9)	20 (23.8)	7 (8.3)	7.1265	0.309
STPM/ Diploma or equivalent	140	87 (62.1)	35 (25)	18 (12.9)		
Bachelor's degree	173	105 (60.7)	56 (32.4)	12 (6.9)		
Master or PhD	31	21 (67.7)	9 (29.0)	1 (3.2)		
Income per month						
B40	285	174 (61.1)	81 (28.4)	30 (10.5)	5.9340	0.204
M40	130	89 (68.5)	33 (25.4)	8 (6.2)		
T20	13	7 (53.9)	6 (46.2)	0 (0)		

Table 3 (continued)

Variable	n	SSBs consumptions			Chi-square value	p
		0 -1 liter n (%)	1 - 3 liter n (%)	> 3 liters n (%)		
Residency						
Rural	135	91 (67.4)	32 (23.7)	12 (8.9)	1.9053	0.386
Urban	293	179 (61.1)	88 (30.0)	26 (8.9)		
Marital status						
Single	185	103 (55.7)	62 (33.5)	20 (10.8)	7.6904	0.021**
Married	243	167 (68.7)	58 (23.9)	18 (7.4)		
Number of households						
1 to 4 members	190	106 (55.8)	66 (34.7)	18 (9.5)	11.8761	0.018**
5 to 8 members	220	155 (70.5)	48 (21.8)	17 (7.7)		
More than 8 members	18	9 (50)	6 (33.3)	3 (16.7)		
Body Mass Index (BMI)						
Lightweight	32	18 (56.3)	11 (34.4)	3 (9.4)	5.0325	0.540
Normal	191	116 (60.7)	57 (29.8)	18 (9.4)		
Overweight	125	86 (68.8)	32 (25.6)	7 (5.6)		
Obesity	80	50 (62.5)	20 (25)	10 (12.5)		

Notes: *Significant at 10%, ** Significant at 5% and ***Significant at 1%

Factors influencing SSBs consumption

Next, the factors influencing SSBs consumption were analyzed using multiple linear regression. The external factors, such as brand, promotion, accessibility, and lifestyle, were examined to determine their effect on SSBs consumption. Based on the regression model estimated in Stata, the following equation was obtained:

$$Y (\text{Total SSB Consumption}) = a + \beta_1 \text{ Brand} + \beta_2 \text{ Promotion} + \beta_3 \text{ Accessibility} + \beta_4 \text{ Lifestyle}$$

Table 4 presents the regression results examining the factors influencing SSB consumption. Brand and lifestyle were found to be statistically significant at the 10% and 1% levels, respectively, while promotion and availability were not significant predictors. The estimated coefficients show a positive relationship between both brand and lifestyle with SSBs consumption. Specifically, a one-unit increase in the brand factor score is associated with a 3.437-unit increase in SSBs consumption, whereas a one-unit increase in lifestyle score corresponds to a 5.871-unit increase. The F-statistic value of 6.202, with a probability of 0.001 (<0.01), indicates that the overall model is statistically significant. These results suggest that brand perception and lifestyle patterns play a meaningful role in shaping SSBs consumption, while promotional activities and product availability have limited explanatory power in this sample.

Table 4: Multiple linear regression analysis of the factors influencing SSBs consumption

Model	Coefficient	Std. Error	t	P> t
Brand	3.437259	1.850673	1.86	0.064*
Promotion	0.3934397	1.840709	0.21	0.831
Accessibility	1.695516	1.71903	0.99	0.325
Lifestyle	5.870567	2.135061	2.75	0.006***
_cons	23.07364	4.166894	5.54	0.000
F (5,428) = 6.20278				
Prob > F = 0.0001				
R-squared = 0.0554				

Notes: *Significant at 10%, ** Significant at 5% and ***Significant at 1%

Discussion

This study provides new insights into the factors shaping sugar-sweetened beverage (SSBs) consumption in Malaysia by examining both demographic characteristics and behavioral determinants. Overall, the findings highlight that SSBs intake is not only influenced by sociodemographic profiles but also by brand perceptions and lifestyle practices, which together create a complex web of demand-side drivers. Age

emerged as a strong predictor of SSBs consumption. Younger respondents, particularly those aged 15–24, recorded the highest proportion of heavy intake (>3 liters weekly). This result is consistent with global evidence reporting a rising prevalence of high SSBs consumption among young adults (15 – 39 years old) (Ge et al., 2025). Gan, Mohamed, & Law (2019) also reported that SSBs intake was higher among adolescents, partly due to unhealthy home food availability. However, in the Malaysian context, younger individuals are often students who live away from their families, where parental supervision and access to healthy food are limited. This situation could contribute to higher SSBs consumption among this age group. In contrast, older respondents, especially those aged 45 and above, reported substantially lower consumption. This pattern reflects earlier evidence by Cheah et al. (2023b), who found that although older individuals retain a preference for sweetness, health awareness and lifestyle adjustments often lead them to reduce SSBs intake. Thus, while younger groups tend to translate their sweet preference into actual beverage consumption, older individuals may exercise greater restraint due to health concerns.

Ethnic differences were also evident. Malay respondents were more likely to be light consumers, whereas Chinese respondents clustered in the moderate consumption group, and Indians/others showed a more balanced distribution. This finding is consistent with Salleh et al. (2021), who also reported that ethnicity contributed to variations in SSBs consumption. These differences suggest that cultural and lifestyle practices influence beverage preferences, a finding that echoes past studies linking dietary behaviors to ethnic-specific norms and social environments.

Marital status further shaped consumption behaviors. Single respondents reported higher levels of moderate and heavy consumption compared to married individuals, who were more concentrated in the light category. This finding is consistent with Cheah et al. (2018, 2023), who reported that married households tend to allocate more overall expenditure to sugar-rich foods and beverages, possibly due to family and social needs. However, the present results also suggest that marriage may act as a moderating factor, as shared household decision-making and family health concerns may encourage lower per-capita intake compared to the autonomy enjoyed by single individuals. Household size also influenced consumption, with medium-sized households (5–8 members) showing the highest proportion of light consumers, while smaller and larger households were more represented in the moderate and heavy categories, respectively. These results suggest that household dynamics, including sharing behaviors and food budgeting, can significantly shape beverage choices.

For the consumption pattern, the majority of the respondents (63.1%) reported consuming less than 1 liter of SSBs weekly, suggesting a relatively low frequency of intake for most individuals. However, nearly one-third (28%) consumed between 1–3

liters, and a smaller but important proportion (8.9%) exceeded 3 liters weekly. The latter groups are of particular concern from a public health perspective, as heavy consumption of SSBs has been linked to obesity, diabetes, and other non-communicable diseases (WHO, 2018). These findings mirror Bakar et al. (2020), who observed similar levels of moderate consumption among Malaysian university students, suggesting that affordability and easy accessibility play key roles in sustaining regular SSBs intake. Regression results demonstrated that brand perception and lifestyle were significant determinants of SSBs consumption, while promotion and availability were not. The positive coefficient for brand indicates that consumers with stronger brand associations are more likely to increase their intake, supporting Cavanagh and Forestell (2013), who emphasized the role of brand identity in shaping food and beverage choices. Similarly, lifestyle showed a strong positive influence, consistent with Gan et al. (2019), who highlighted the role of health-conscious behaviors in moderating adolescent SSBs intake. By contrast, the non-significance of promotion and availability suggests that consumption is not primarily driven by short-term marketing offers or physical access, but rather by deeper behavioral attachments and lifestyle practices. This implies that interventions focusing solely on pricing and availability may not be sufficient to reduce demand if consumer choices remain strongly anchored in brand loyalty and lifestyle identity.

Taken together, these results underscore the importance of designing multifaceted interventions. While fiscal measures such as the SSBs excise tax introduced in Malaysia in 2019 remain important, they should be complemented by strategies that target the behavioral drivers of consumption. This could include stricter regulation of beverage advertising, especially to younger audiences, greater promotion of healthier alternatives, and public campaigns that reshape consumer perceptions of brand identity and lifestyle norms. Addressing SSBs consumption as both an economic and behavioral issue is essential to reducing long-term risks of obesity and non-communicable diseases in Malaysia.

Conclusion

This study examined the factors influencing consumer demand for sugar-sweetened beverages (SSBs) in Malaysia, focusing on both sociodemographic and external factors such as brand, promotion, accessibility, and lifestyle. Using primary survey data and multiple linear regression analysis, the results revealed that brand perception and lifestyle factors have a significant impact on SSBs consumption, while promotion and product accessibility were not found to be significant. These findings underscore the importance of consumer lifestyle patterns and brand-related perceptions in shaping demand, suggesting that consumption behavior is influenced more by personal and psychological factors than by marketing strategies or ease of access.

The implications of this study are twofold. First, it provides evidence that public health policies and interventions should emphasize the promotion of healthier lifestyle practices, including raising awareness of the health risks associated with SSBs consumption, while also addressing brand-driven perceptions that may encourage higher intake. Second, it highlights the need for targeted strategies that consider the role of branding in influencing consumer decisions, such as regulating health claims, promoting healthier alternatives, and designing effective public campaigns. Overall, the findings contribute to the growing body of literature on consumer behavior and health economics in Malaysia, offering insights for policymakers, marketers, and health practitioners. Future research could expand by incorporating longitudinal data, exploring substitution effects with healthier beverage options, and examining behavioral interventions that could reduce the long-term demand for SSBs in Malaysia.

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