

THE RELATIONSHIP BETWEEN ATTITUDES TOWARDS SUGARY
FOOD, DEMOGRAPHICS AND BODY MASS INDEX (BMI) ON
SWEET-TASTING FOOD INTAKE AMONG FEMALE ADULTS IN
KOTA BHARU

by

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Dissertation submitted in partial fulfilment
of the requirements for the degree
of Bachelor of Health Science (Honours)
(Nutrition)

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CERTIFICATE

This is to certify that the dissertation entitled THE RELATIONSHIP BETWEEN ATTITUDES TOWARDS SUGARY FOOD, DEMOGRAPHICS AND BODY MASS INDEX (BMI) ON SWEET-TASTING FOOD INTAKE AMONG FEMALE ADULTS IN KOTA BHARU is bona fide record of research work done by Ms JOHANA NASREEN BINTI MOHAMAD RIZAL during the period from April 2025 to January 2026 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Health Science (Honour) (Nutrition).

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promotional purposes.

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Table of Contents

CERTIFICATE.....	ii
DECLARATION.....	iii
LIST OF TABLES	viii
ABSTRAK.....	x
ABSTRACT.....	xii
CHAPTER 1: INTRODUCTION	1
1.1 Introduction.....	1
1.2 Problem Statement	4
1.3 Research Question.....	5
1.4 Research Objectives	6
1.4.1 General Objective.....	6
1.4.2 Specific Objectives.....	6
1.5 Research Hypothesis	7
1.5.1 Null Hypothesis (H_0).....	7
1.5.2 Alternative Hypothesis (H_a)	7
1.6 Significance of Study	8
1.7 Conceptual Framework.....	9
CHAPTER 2: LITERATURE REVIEW.....	10
2.1 Attitudes Towards Sugary Food and Sweet-Tasting Food Intake	10
2.2 Demographic and Sweet-Tasting Food Intake	13
2.2.1 Age and Sweet-Tasting Food Intake.....	13
2.2.2 Gender and Sweet-Tasting Food Intake	14
2.2.3 Ethnicity and Sweet-Tasting Food Intake	15
2.2.4 Socioeconomic Status and Sweet-Tasting Food Intake.....	16
2.2.5 Lifestyle Characteristics and Sweet-Tasting Food Intake	17
2.2.6 Cultural and Social Influences on Sweet-Tasting Food Intake	18
2.3 Body Mass Index and Sweet-Tasting Food Intake.....	19
2.4 Emotional State and Sweet-Tasting Food Intake	20
2.5 Stress Level and Sweet-Tasting Food Intake	21
CHAPTER 3: METHODOLOGY	22
3.1 Study Design.....	22
3.2 Study Area.....	22
3.3 Study Population.....	23

3.4 Subject Criteria	24
3.4.1 Inclusion Criteria	24
3.4.2 Exclusion Criteria	24
3.5 Sample Size Estimation	25
3.6 Sampling Method	29
3.7 Research Instrument	31
3.8 Study Period	33
3.9 Operational definition	34
3.10 Data Collection Method	36
3.11 Study flowchart	37
3.12 Data Analysis	38
3.13 Ethical Consideration	39
3.13.1 Subject vulnerability	39
3.13.2 Declaration of absence of conflict of interest	39
3.13.3 Privacy and confidentially	39
3.13.4 Community sensitives and benefits	40
3.13.5 Honorarium and Incentives	40
CHAPTER 4: RESULTS	41
4.1 Demographic Characteristics	41
4.2 Body Mass Index (BMI) of Participants	43
4.3 Attitudes Score of Participants	44
4.4 Demographic Characteristics and Sweet-Tasting Food Intake	45
4.5 Body Mass Index (BMI) and Sweet-Tasting Food Intake	47
4.6 Attitudes Towards Sugary Food and Sweet-Tasting Food Intake	49
CHAPTER 5: DISCUSSION	50
5.1 Demographic Characteristic of Participants	50
5.2 Body Mass Index (BMI) of Participants	51
5.3 Attitudes Towards Sugary Food of Participants	52
5.4 Demographic Characteristic and Sweet-Tasting Food Intake	53
5.5 BMI and Sweet-Tasting Food	56
5.6 Attitudes Towards Sugary Food and Sweet-Tasting Food Intake	57
5.7 Limitations of the Study	60
CHAPTER 6: CONCLUSION AND RECOMMENDATION	62
6.1 Conclusion	62

6.2 Recommendation 63

References..... 65

Appendix A 76

Appendix B 104

Appendix C 105

Appendix D 115

Appendix E 117

LIST OF TABLES

Table 4.1: Demographic characteristics of participants.....	41
Table 4.1: Continued.....	42
Table 4.2: Attitudes Score of Participants.....	44
Table 4.3: Demographic Characteristic and Mean Intake of Sweet-Tasting Food.....	45
Table 4.4: Spearman's Correlation Coefficients (r) and p-values for the relationship between Age and Income, and Sweet-Tasting Food Intake.....	46
Table 4.5: BMI and Mean Intake of Sweet-Tasting Food.....	47
Table 4.6: Spearman's Correlation Coefficients (r) and p-values for the relationship between BMI and Sweet-Tasting Food Intake.....	48
Table 4.7: Pearson Correlation Coefficients (r) and p-values for the relationship between Attitudes and Sweet-Tasting Food Intake.....	49

LIST OF FIGURES

Figure 3.5.1: Linear multiple regression.....	26
Figure 3.5.2: Linear multiple regression.....	27
Figure 3.5.3: Correlation.....	28
Figure 3.11: Study Flowchart.....	37
Figure 4.1: Body Mass Index.....	43

ABSTRAK

Isu kesihatan metabolik boleh berpunca daripada pengambilan makanan berasa manis yang berlebihan, namun interaksi yang rumit antara faktor persekitaran dan manusia kerap menjejaskan pemilihan makanan. Kajian ini bertujuan untuk mengkaji hubungan antara sikap, ciri demografi dan indeks jisim badan (BMI) terhadap pengambilan makanan berasa manis dalam kalangan wanita di Kota Bharu, Kelantan. Kajian keratan rentas telah dijalankan di kalangan wanita ($n = 96$) di Kota Bharu. Data demografi, ketinggian dan berat yang dilaporkan sendiri untuk pengiraan BMI dan sikap (Kesan Peribadi, Pengurusan Peribadi, Negativiti dan Persepsi Non-autonomi) telah diperolehi. Pengambilan makanan berasa manis dinilai menggunakan pendekatan berasaskan kekerapan makanan yang mengkategorikan pengambilan kepada penambahan gula, penambahan pemanis rendah dan tanpa kalori (LNCS), makanan yang mengandungi gula dan makanan tanpa gula. Data dianalisis menggunakan ujian Kruskal-Wallis, pekali korelasi Pearson dan ujian korelasi Spearman's rank. Majoriti peserta adalah Melayu ($n=87$), diikuti oleh perwakilan yang lebih kecil daripada etnik Cina ($n=5$) dan India ($n=4$). Keputusan menunjukkan tidak terdapat hubungan yang signifikan antara pengambilan makanan berasa manis dan umur ($p = 0.062$), etnik ($p = 0.273$) atau tahap pendidikan ($p = 0.400$). Begitu juga, pendapatan ($r = -0.010$, $p = 0.919$) dan BMI ($r = -0.057$, $p = 0.581$) tidak menunjukkan korelasi yang signifikan dengan pengambilan makanan berasa manis. Walau bagaimanapun, terdapat korelasi negatif yang sederhana signifikan antara sikap Kesan Peribadi dan pengambilan makanan berasa manis ($r = -0.429$, $p < 0.001$), menunjukkan bahawa kesedaran yang lebih tinggi tentang kesan negatif gula adalah berkaitan dengan pengambilan yang lebih rendah. Pembolehubah sikap lain, termasuk Pengurusan Peribadi, Negativiti, dan Persepsi Non-autonomi tidak berkorelasi

secara ketara dengan pengambilan. Kesimpulannya, faktor demografi dan komposisi badan bukanlah peramal utama pengambilan makanan berasa manis di kalangan wanita dalam suasana makanan yang kaya gula di Kota Bharu. Sebaliknya, perspektif psikologi individu tentang kesan peribadi gula adalah lebih penting untuk mengawal penggunaan.

ABSTRACT

Metabolic health issues can be caused by excessive consumption of sweet-tasting foods, however a complicated interaction between environmental and human factors frequently affects food choices. This study aimed to investigate the relationship between attitude, demographic characteristics and body mass index (BMI) toward sweet-tasting food intake among females in Kota Bharu, Kelantan. A cross-sectional study was conducted among female adults ($n = 96$) in Kota Bharu. The demographic data, self-reported height and weight for BMI calculation and attitudes (Personal Impact, Personal Management, Negativity and Perceived Non-autonomy) were obtained. The intake of sweet-tasting foods was assessed using a food frequency-based approach that categorized intake into adding sugar, adding low and no-calorie sweeteners (LNCS), sugar-containing foods and sugar-free foods. Data was analysed using the Kruskal-Wallis test, Pearson correlation coefficients and Spearman's rank correlation test. The majority of participants were Malay ($n=87$), followed by a smaller representation of ethnic Chinese ($n=5$) and Indians ($n=4$). Results showed there was no significant relationship between sweet-tasting food intake and age ($p = 0.062$), ethnicity ($p = 0.273$) or education level ($p = 0.400$). Similarly, income ($r = -0.010$, $p = 0.919$) and BMI ($r = -0.057$, $p = 0.581$) revealed no significant correlation with sweet-tasting food intake. However, there was a moderately significant negative correlation between Personal Impact attitudes and sweet-tasting food intake ($r = -0.429$, $p < 0.001$), indicating that higher awareness of the negative effects of sugar was related to lower consumption. Other attitude variables, including Personal Management, Negativity, and Perceived Non-autonomy, were not significantly correlated with the consumption. In conclusion, demographic factors and body composition were not the primary predictors of sweet-tasting food intake among females in a sugar-rich food

setting in Kota Bharu. Instead, an individual's psychological perspective on the personal effects of sugar is more important for controlling consumption.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Malaysia shows the highest prevalence of obesity recorded among Southeast Asian countries (Tak et al., 2024). The increasing proportion of obesity and diabetes mellitus in the Malaysian population has led to increased focus on the consumption of sweet-tasting food as a major contributing factor to the occurrence of obesity and diabetes. Kelantan has a high prevalence of obesity, but not the highest in Malaysia (NHMS, 2023), however at the national level, obesity remains more common among women than men (Chong et al., 2023). The National Health and Morbidity Survey 2019 reported that 24.7% of Malaysian women were obese as compared to 15.3% of men, indicating a gender difference in the prevalence of obesity (OPEN Malaysia, 2025). As the prevalence of obesity is particularly high among women, compared to men in Malaysia, such a pursuit for evidence on the fat and sweet taste preference is imperative for women to comprehend the disparate factors contributing to sweet taste intake in this population of interest. The disproportionately high obesity rates among women raise the possibility that dietary habits, such as sweet food choices and consumption patterns, may have a greater influence on public health outcomes. The selection of women as the target group is further justified by their distinct physiological, psychological, and social characteristics, including hormonal influences, emotional eating impulses, and culturally developed attitudes toward food.

Traditionally, sweet-tasting foods were primarily associated with high sugar content, contributing to excessive calorie intake and increased risk of non-communicable diseases. A wide variety of traditional and contemporary sweet delicacies, such as *kuih* and *ais kacang*, are part of Malaysia's distinctive culinary culture, which is ingrained in social

and cultural practices (Sia et al., 2013). The local cuisine and delicacies may be accountable for the high number of diabetes cases recorded in Kelantan because the majority of the dishes are sweet and heavy in sugar (Letchuman et al., 2010). Observed variations in the palatability and consumption of sweet foods among Malay, Chinese, and Indian populations are frequently attributed to established cultural dietary norms. However, the modern food landscape has evolved, and sweet-tasting foods now include not only sugary products but also those formulated with non-nutritive or low/no-calorie sweeteners. These sweeteners, such as aspartame, sucralose, stevia, and acesulfame-K, are intensely sweet compounds that provide the desired taste with little or no calories and are widely used in beverages, desserts, and processed foods as sugar substitutes (Bayram & Ozturkcan, 2022).

However, the use of non-nutritive sweeteners has become an important strategy in dietary management, especially for individuals at risk of or living with diabetes and obesity. By replacing sugar with these alternatives, it is possible to reduce overall calorie and carbohydrate intake, which may help with weight management and blood glucose control (Shmerling, 2019). Public health authorities now recommend limiting free sugar intake (NCCFN, 2021), and the availability of non-calorie sweetened foods offers consumers a way to enjoy sweet flavours while adhering to these guidelines. Free sugar is not similar to "sugar-free" products, which per labelling regulations include less than 0.5 g of total sugars per serving, while free sugar contains added and naturally occurring sugars that should be regulated for health reasons (Swan et al., 2018). Despite their potential benefits, the consumption of both sugary and non-nutritive sweetened foods is influenced by a complex interplay of attitudes, demographic factors, and physiological characteristics such as body mass index (BMI). Understanding how these factors shape sweet-tasting food intake among adults in Kota Bharu is essential for developing

effective, culturally relevant interventions aimed at reducing the burden of diet-related diseases in this high-risk population.

1.2 Problem Statement

Non-communicable diseases nowadays are giving more burden to the country compared to communicable diseases. Type 2 Diabetes Mellitus, cardiovascular disease, and obesity are no longer just diseases suffered by the elderly, many young people are also suffering from these diseases. There is about 17.5% of young adults under 20 years old in Malaysia have diabetes (Nathan et al., 2023). Preventive measures should be taken from the beginning, starting with home education. Therefore, the role of women is important, not only in taking care of their health but also in taking care of the welfare of household members because, in Malaysian society, women are usually the ones who prepare food and cook at home. By 2019, Kelantan had been reported to have 19.5% of adults with diabetes, and 71,942 people were diagnosed in 2023 (Ministry of Health, 2023). Hence, Kelantan remains among the states with the highest rates of diabetes in Malaysia. This issue is making matters worse by the increasing prevalence of eating high-sugar foods, including popular "viral" drinks and sweets (Ge et al., 2025).

This study aims to investigate the factors influencing sweet-tasting food intake specifically among females in Kota Bharu, recognizing that women often exhibit distinct dietary behaviours and attitudes toward sweet foods compared to men (Babicz-Zielińska et al., 2006; Sabella et al., 2022). Attitudes towards sugary food, including personal impact, personal management, negativity, and perceived nonautonomy, are the variables that may influence the consumption of sweet-tasting food among female adults. Furthermore, other variables such as demographics and BMI will be investigated in this study, considering the evidence that these variables have particular effects on the eating habits and choices of women. By focusing on females in Kota Bharu, the study seeks to provide nuanced insights into the complex interplay of psychological, social, and

biological factors driving sweet food consumption, which can inform targeted health promotion strategies aimed at improving dietary behaviours and reducing diet-related health risks in this population.

1.3 Research Question

1.3.1 What is the prevalence of obesity among female adults in Kota Bharu?

1.3.2 What is the mean score of the attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) among female adults in Kota Bharu?

1.3.3 Is there any relationship between demographics and lifestyle characteristics (age, ethnicity, education level, socio-economic status), and the intake of sweet-tasting foods among female adults in Kota Bharu?

1.3.4 Is there any relationship between attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) and the intake of sweet-tasting foods among female adults in Kota Bharu?

1.3.5 Is there any relationship between body mass index (BMI) and the intake of sweet-tasting foods among female adults in Kota Bharu?

1.4 Research Objectives

1.4.1 General Objective

1.4.1.1 To investigate the associated factors of sweet-tasting food intake among female adults in Kota Bharu.

1.4.2 Specific Objectives

1.4.2.1 To determine the body mass index (BMI) among female adults in Kota Bharu.

1.4.2.2 To determine the attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) among female adults in Kota Bharu.

1.4.2.3 To determine the relationship between demographics (age, ethnicity, education level, socio-economic status) and the intake of sweet-tasting foods among female adults in Kota Bharu.

1.4.2.4 To determine the relationship between attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) and the intake of sweet-tasting foods among female adults in Kota Bharu.

1.4.2.5 To determine the relationship between body mass index (BMI) and the intake of sweet-tasting foods among female adults in Kota Bharu.

1.5 Research Hypothesis

1.5.1 Null Hypothesis (H_0)

There is no relationship between attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) and the intake of sweet-tasting foods among female adults in Kota Bharu.

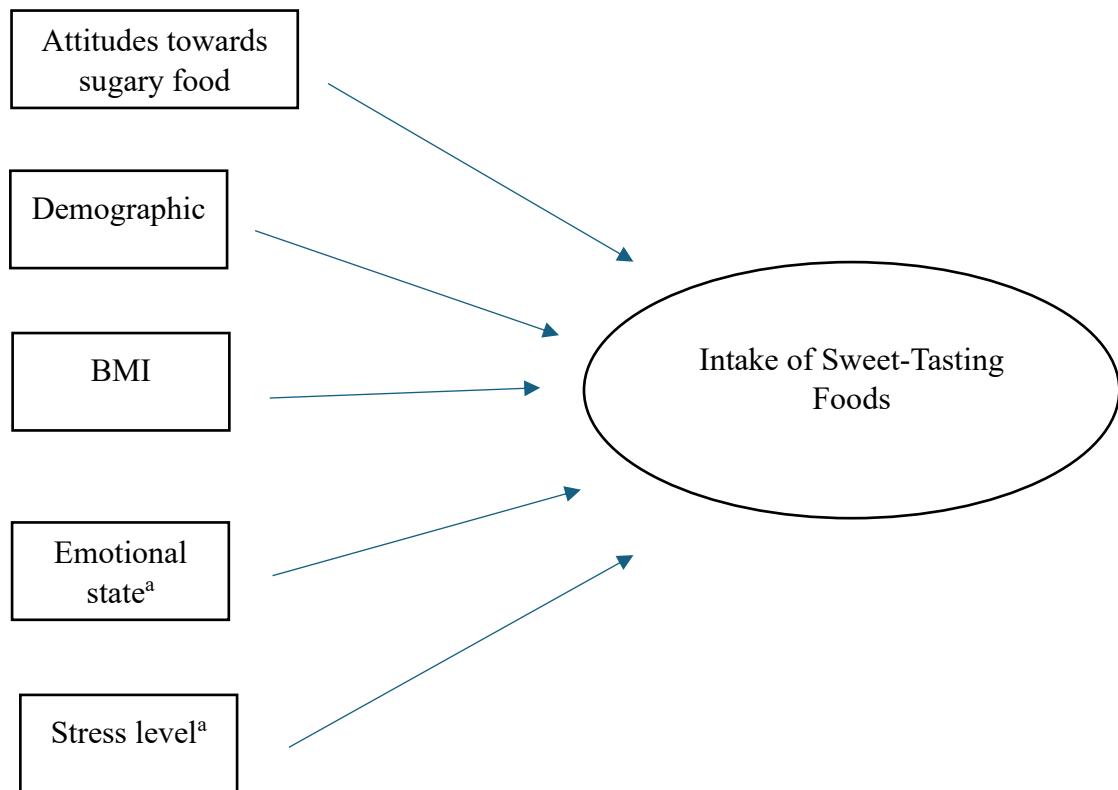
1.5.2 Alternative Hypothesis (H_a)

There is a relationship between attitudes towards sugary food (personal impact, personal management, negativity, perceived nonautonomy) and the intake of sweet-tasting foods among female adults in Kota Bharu.

1.6 Significance of Study

This study contributed to understanding factors that influence the consumption of sweet-tasting food among women. Specifically in Kota Bharu, the study explored the relationship between attitudes towards sugary food, demographics, and BMI on sweet-tasting food intake, as the National Health and Morbidity Survey (NHMS) 2023 reported that the average Kelantan population with diabetes is 16.3%, which is higher than the national average of 15.6% (Institute for Public Health, 2024). Moreover, studying the aspect of BMI provides information about the relationship between sweet-tasting food intake and body weight status, which is important to identify at-risk groups. In an effort to reduce excessive sugar consumption in Kota Bharu, public health professionals, nutritionists, dietitians, and policymakers will find the study's findings useful in developing focused, culturally relevant interventions. The result of this study can be used to plan a health program with this vulnerable population in Kota Bharu as an early prevention measure to overcome non-communicable diseases such as diabetes and obesity. In summary, this study supports broader efforts to improve nutritional health and promote prevention actions, as well as reduce the burden of treating chronic diseases in Kelantan and Malaysia as a whole.

1.7 Conceptual Framework



Factor^a will not be investigated in this research.

The conceptual framework shows variables that influence the intake of sweet-tasting food based on literature review. Attitudes towards sugary food were assessed and categorized into four domains, which were personal impact, personal management, negativity, and perceived nonautonomy. Demographic information such as age, ethnicity, and socioeconomic status was also collected. Additionally, the body mass index (BMI) of participants was recorded to explore its relationship with the intake of sweet-tasting food. Although emotional state and stress level are known to influence eating behaviour, these factors were not investigated in this research.

CHAPTER 2: LITERATURE REVIEW

2.1 Attitudes Towards Sugary Food and Sweet-Tasting Food Intake

Personal impact is a perception of individuals of how their actions affect their health and well-being (Tang et al., 2024). According to research, people are more likely to restrict their consumption of sweet foods if they think their dietary decisions have a big influence on their health. When individuals recognize the tangible effects of their behaviours, they are more likely to engage in healthier practices and make conscious decisions that support their long-term well-being (Chen et al., 2023). For example, research finds that people who have a strong sense of personal influence tend to consume fewer sugary foods and drinks because they are more aware of the potential health effects of their decisions (Tang et al., 2024). However, there is a weak relationship ($r = 0.196$; $p < 0.001$) between sugar intake and personal impact (Enc et al., 2024).

According to Tang et al. (2024), personal management describes the methods and practices people implement to regulate their food consumption. Strong personal management abilities, such as meal planning, food intake tracking, and goal-setting, increase the possibility that people will control their intake of sugary foods. On the other hand, people who struggle with self-management may find it harder to restrict their consumption of sugary foods, which could result in higher levels of consumption (Tang et al., 2024; Enc et al., 2024). According to Schwarzer and Renner (2000), personal management refers to a person's initiative and sense of accountability for managing their food consumption. It requires a positive evaluation of self-control, goal-setting, and confidence that one can successfully control one's eating habits to reach health objectives.

A higher score for this attitude shows that the participant feels in control of their sugar intake and values and engages in “mindful eating” (Schwarzer & Renner, 2000).

Negativity in the context of food attitudes refers to the existence of unpleasant feelings related to eating, such as guilt, frustration, or pessimism, or the incapacity to restrain desires. It can also refer to a "defeatist" mindset where people believe that eating healthily is difficult or unlikely to be successful (Tang, 2022). Dietary habits or negative attitudes towards particular foods can also affect how much sweet food is consumed. People who see sugary meals as hazardous or unhealthy, for instance, could avoid them, but people who have a more pleasant opinion of sweet foods might eat them more often (Enc et al., 2024). However, overwhelming negativity towards particular food groups can occasionally result in feelings of limitation or deprivation, which can lead to overconsumption (Enc et al., 2024; Kowalkowska et al., 2018). Emotional eating or "stress-eating" sweet foods as a coping strategy may be linked to high negativity scores (Stunkard & Messick, 1985).

Perceived nonautonomy describes an individual's belief that external factors strongly influence their personal decisions rather than their own choices, and can also impact the intake of sweet-tasting foods (Tang et al., 2024). People may be more prone to consume sugary foods and beverages if they believe they have little control over their dietary choices and that availability, cost, or societal constraints dictate their food choices (Enç et al., 2024; Garbacz et al., 2024). Negativity and perceived autonomy significantly predicted attitudes, while attitudes influenced intentions and sugar intake through intentions. However, attitudes did not influence sugar intake directly (without intentions) (Enç et al., 2024). Similarly, a study by Phipps et al., who examined the theory of planned

behaviour for predicting sugar intake in adolescents, reported that attitude had a positive and significant effects on intention to intake sugar. However, intention was not associated with sugar intake (Phipps et al., 2020).

2.2 Demographic and Sweet-Tasting Food Intake

2.2.1 Age and Sweet-Tasting Food Intake

Consumption of sweet foods is known to be influenced by age, as many studies have shown that younger people, especially children and adolescents, have a greater attraction for sweet flavours than adults. Younger individuals prefer more concentrated sweetness than adults, and this preference usually decreases with age as adults tend to favour less sweet or more savoury flavours, according to experimental research employing techniques like the Monell Forced-Choice, Paired-Comparison Tracking Procedure (Mennella et al., 2011). These results have been supported by longitudinal and cross-sectional research, which demonstrate that consumption of sugar-sweetened beverages (SSBs) and added sugar intake decline from adolescence into early adulthood (Moynihan & Kelly, 2014; Poti et al., 2017). For example, a systematic review and meta-analysis revealed a significant decrease in the amount of added sugar and confectionery consumed annually by those aged 13 to 30. This suggests that dietary habits and taste preferences change as people age (Moynihan & Kelly, 2014). Adolescents and younger adults typically consume more sweet foods and beverages on average than older adults, according to population-based studies conducted in a variety of settings, including Malaysia (Cheah et al., 2019; Fontes et al., 2020). This underscores the need for focused interventions to lower sugar intake among younger populations. These results together highlight the significance of age as a determinant of sweet-tasting food consumption and preference.

2.2.2 Gender and Sweet-Tasting Food Intake

Consumption patterns for sweet foods are also influenced by gender. Some research suggests that women may prefer sweet flavours more than males, whereas other studies imply that gender variations in sweet preferences are not usually significant. For instance, a French study indicated that women were more likely to have a high preference for sweet flavours than for salty ones (Lampuré *et al.*, 2015). According to a study conducted in Thailand, males were found to consume more taxed sugar-sweetened beverages than females, indicating that gender-specific interventions could be required to alleviate inequalities in the consumption of sweet foods (Phulkerd *et al.*, 2022). Similarly, a Malaysian study found that households headed by women were more likely to spend money on products with added sugar, suggesting that gender roles within homes may affect consumption and purchase patterns (Cheah *et al.*, 2020; Cheah *et al.*, 2019). In addition, women are at a higher risk of developing disordered eating habits and are more prone to report emotional and sugary eating patterns (Barkeling *et al.*, 2006). Furthermore, the observed gender differences in sweet food consumption may also be attributed to differences in men's and women's dietary reasons and taste perceptions (Ahmad Riduan Bahauddin *et al.*, 2022).

2.2.3 Ethnicity and Sweet-Tasting Food Intake

Another significant element influencing the consumption of sweet foods is ethnicity. Dietary habits and preferences are frequently influenced by cultural and ethnic variances, as some ethnic groups have stronger preferences for sweet flavours because of traditional eating patterns. For instance, a study carried out in the United States discovered that even after controlling for socioeconomic characteristics, Black children and adolescents preferred more concentrated sucrose solutions than their White counterparts (Mennella et al., 2011). Similar to this, a study conducted in the Netherlands found that people living in Suriname followed routine dietary patterns more diligently, which included foods high in sugar and starch (Dekker et al., 2015). The significance of taking ethnic and cultural aspects into account when creating interventions to lower the intake of sweet foods is made apparent by this finding. Besides that, one study found that Malaysian adults preferred significantly sweeter orange juice than Caucasians from England or Australia (Abdullah, 1995). However, according to Holt et al. (2000), the study challenges the assumption of a universal cultural preference for increased sweetness, showing that Malaysian consumers did not show a significant preference for higher levels of sweetness in Western-style products compared to their Caucasian Australian counterparts. Although small and inconsistent differences in liking ratings were observed, these results suggest that cultural background alone is not a reliable predictor of hedonic responses to sweetness in formulated foods.

2.2.4 Socioeconomic Status and Sweet-Tasting Food Intake

One important factor influencing the consumption of sweet foods is socioeconomic class (SES), with those with lower SES frequently consuming more sugary meals and drinks. According to a study done in Thailand, those who live in cities and have less education are more prone to drink beverages that contain high levels of sugar (Phulkerd et al., 2022). Similarly, a Malaysian study found that households with lower incomes and educational attainment were more inclined to purchase products with added sugar (Cheah et al., 2020; Cheah et al., 2019). The accessibility and price of sugary foods are two of the elements that contribute to the association between SES and sweet food consumption. People with low incomes could choose to meet their energy needs more affordably by consuming less expensive, high-sugar foods. According to Berger et al. (2021), individuals from lower socioeconomic backgrounds consumed most of their sugar through less healthy foods and beverages, rather than nutritious options. Hence, there is an inverse relationship between socioeconomic status and consumption of sweetened sugar beverages, which means individuals with lower income and wealth consume more sugary beverages regardless of the individual's level of education (Zagorsky & Smith, 2020). Women who live in households where it is difficult to buy food are 10% to 14% more likely to drink sugary drinks than those who have enough food (Warren et al., 2022). Furthermore, communities with lower incomes are frequently the focus of marketing campaigns, which encourage the consumption of sugary foods (Smith & Smith, 1994). Low income and low education groups are vulnerable to diets high in added sugars (Thompson et al., 2009)

2.2.5 Lifestyle Characteristics and Sweet-Tasting Food Intake

Dietary practices, physical activity, and sedentary behaviour are examples of lifestyle factors that affect the consumption of sweet foods. Teenagers in Malaysia who engaged in more screen time and physical activity were more likely to drink sugar-sweetened beverages (Gan et al., 2019), indicating that lifestyle factors may influence food preferences in two ways. In addition, dietary patterns and eating behaviours are strongly influenced by lifestyle factors. A study conducted in Saudi Arabia discovered that people who regularly ate at fast-food restaurants were more likely to follow a "sweet & starch" dietary pattern, which is defined by a high intake of sweet and starchy foods (Bawazeer et al., 2021). Similarly, a French study reported that people who were more physically active were less likely to eat foods that were sweetened with fat, underscoring the need to encourage active lives in order to lower sugar intake (Méjean et al., 2010).

2.2.6 Cultural and Social Influences on Sweet-Tasting Food Intake

Sweet food consumption is also greatly influenced by social and cultural variables. Social norms, environmental influences, and cultural customs all have an impact on dietary choices. As an illustration, a study performed in a Catholic Middle Eastern Canadian community revealed that sweetened goods were mostly taken in between meals, indicating that social norms and cultural customs around snacking may be a factor in increased sugar intake (Moubarac et al., 2014). Preschoolers from immigrant families were more likely to eat sweets, according to a German study, underscoring the influence of social and cultural variables on eating patterns (Schneider et al., 2013). Similarly, a study conducted in Mexico found that eating sweet meals and drinks was a common part of social events and family customs, underscoring the effect of social and cultural factors on dietary preferences (Benitez et al., 2017).

2.3 Body Mass Index and Sweet-Tasting Food Intake

The complex relationship between sweet taste perception, consumption of sweet foods, and body mass index (BMI) remains the subject of multiple research studies. The results have been inconsistent and impacted by sensory, psychological, and genetic factors. For instance, O'Connor (2019) observed no obvious differences between lean and overweight women's preferences for sweets, however, BMI moderated certain relationships between eating habits and taste preferences, indicating a complex interaction. Similarly, adolescent studies revealed a correlation between early adult BMI and the perception of sweet taste, which may be due to hereditary factors (Hwang et al., 2016). This connection was further supported by genetic investigations, which showed a strong association between BMI and the sense of sweet taste, suggesting that both attributes may be influenced by common genetic pathways (Hwang et al., 2016). However, Bahauddin et al. (2022) found that 6-n-propylthiouracil (PROP) taster status, a measure of taste sensitivity, had minimal impact on the intake of sweet foods or dietary intake in obese and non-obese individuals, suggesting that genetic taste sensitivity may not be directly linked to variations in sweet food intake.

Additionally, although this link was not statistically significant after correction, teenagers with lesser sweet taste sensitivity exhibited a greater preference for high-sugar diets, which may eventually lead them to higher BMI (Papantoni et al., 2021). In contrast to eutrophic individuals (people with normal or healthy weight and body composition), overweight and obese people have a reduced sensory perception of sweet taste, requiring larger quantities of sucrose to feel sweetness dominance in meals, according to Lima et al. (2023). This implies that a person's BMI categorization affects how much sweet food

they eat since people with higher BMIs would like sweeter items to make up for their diminished taste sensitivity. These studies collectively demonstrate the complex and interconnected elements influencing the perception and consumption of sweet taste, underscoring the importance of taking psychological, sensory, and genetic aspects into account when analyzing dietary practices in connection to BMI.

2.4 Emotional State and Sweet-Tasting Food Intake

There is a constant correlation between a liking for sweet foods and unpleasant emotions like anger, sadness, and fear. This is partly due to the comfortable and gratifying qualities that sweets offer, which serve to reduce negative emotions (Babicz-Zielińska et al., 2006; Sabella et al., 2022). Impulsive ingestion of sugary foods is more likely to occur when moods change, particularly when happy sensations give way to unpleasant ones. Affective regulation theory explains this occurrence by arguing that people eat sweets to control their emotions and look for emotional consolation and stress reduction (Mearns, 2020). Furthermore, emotions can affect the way a person perceives tastes. For instance, anxiety has been shown to lessen the sense of sweetness, which may result in higher consumption to get the desired flavour (Zushi et al., 2021).

Hyperphagia and binge eating are common behaviours of emotional eaters, who also have an affection for sweet and fatty meals when they're feeling down (Sabella et al., 2022). Additionally, studies show that sugary, appetizing foods might momentarily lessen tension and anxiety and alleviate unpleasant feelings (Ulrich-Lai et al., 2015). Excessive emotional responses have been found to increase the intake of sweet and high-energy foods, which reinforces this behaviour (López-Galán & de-Magistris, 2019). These

results collectively reflect the complex relationship between emotional states and the consumption of sweet foods, highlighting the function of sweets as a coping strategy during difficult emotional times. Sweet food consumption patterns are also influenced by psychological aspects, with Barkeling et al. (2002) showing that increasing sweet food intake is associated with mood modulation, especially in women who have greater levels of psychiatric symptoms.

2.5 Stress Level and Sweet-Tasting Food Intake

In both cross-sectional and longitudinal research, it has been demonstrated that long-term stress predicts higher sugar intake, especially of sugar-sweetened beverages, which are then associated with more depressed symptoms (Fish-Williamson & Hahn-Holbrook, 2024; Campos-Ramírez et al., 2023). There are several different mechanisms that underlie this association. Stress can cause people to eat more sweet foods by altering hormonal signalling, which temporarily relieves anxiety and depression by raising cortisol and other stress hormones (Ulrich-Lai, 2016). Furthermore, the hypothalamic-pituitary-adrenal (HPA) axis may be impacted by high-sugar diets, which would further exacerbate the relationship between stress and food choices (Ulrich-Lai, 2016). Sweetener use during stressful situations can also change metabolic reactions, such as raising blood glucose levels, which suggests a physiological stress response (Martínez et al., 2016). However, not everyone reacts to stress by eating more, some people feel less hungry, which emphasizes the variation in how people react to stress and how they eat (Wardle & Gibson, 2005; Ulrich-Lai, 2016).

CHAPTER 3: METHODOLOGY

3.1 Study Design

A cross-sectional design was used for this study. Self-reported questionnaires about attitudes towards sugary food, demographics, BMI, and the consumption of sweet foods by female adults in Kota Bharu, Kelantan, were used to gather data from participants.

3.2 Study Area

The study was conducted across several selected public and private settings in Kota Bharu, Kelantan, to ensure a representative sample of the target population. Data collection activities were systematically carried out, selected for high foot traffic and demographic diversity, at key recruitment sites including religious centres (mosques), key commercial zones such as Pasar Siti Khadijah, AEON Mall Kota Bharu, and KB Mall, as well as major recreation areas and beaches, specifically Pantai Melawi, Pantai Irama and Taman Tengku Anis. A secondary strategy was visiting participants' residences on a set schedule to complete questionnaires under supervision in order to accommodate those who cannot be reached through public recruitment. This dual-setting approach is important in establishing a comprehensive research scope and capturing a true cross-section of the population.

3.3 Study Population

The study population consisted of female adults from Kota Bharu, Kelantan. Diverse socioeconomic backgrounds, age groups, and cultural compositions defined Kota Bharu's diverse population. Considering that the study included women of different ethnic backgrounds, it was significant to emphasise that the majority of people living in Kota Bharu are Malays, with a smaller percentage of Chinese and Indians. This demographic variation enhances the depth and importance of the study findings by enabling the investigation of a wide range of perspectives and actions among females in the area. However, as convenience sampling was used, the findings might not be fully generalizable to the entire female population in Kota Bharu.

3.4 Subject Criteria

3.4.1 Inclusion Criteria

- a) Participants must be at least 18 years old.
- b) Female

3.4.2 Exclusion Criteria

- a) People with disease:
 - i. Diabetes Mellitus patients who required oral medication, insulin, or multiple therapies.
 - ii. Depression and Mood Disorder
- b) Pregnant