

KNOWLEDGE, ATTITUDES, AND PRACTICES OF JUNK FOOD  
CONSUMPTION AMONG NORMAL BMI AND  
OVERWEIGHT/OBESE UNDERGRADUATE HEALTH SCIENCE  
STUDENTS IN USM HEALTH CAMPUS

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SCHOOL OF HEALTH SCIENCES  
UNIVERSITI SAINS MALAYSIA

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Thesis submitted in fulfilment of the requirements for the  
degree of Bachelor of Health Sciences (Honour) (Dietetics)

JULY 2024

## CERTIFICATE

This is to certify that the dissertation entitled “The Study of Knowledge, Attitudes, and Practices Of Junk Food Consumption Among Normal BMI and Overweight/Obese Undergraduate Health Science Students In Universiti Sains Malaysia Health Campus” is the bona fide record of research work done by Ms Nurdini Athirah binti Ahmad Ridzuan during the period from October 2023 to June 2024 under my supervision. I have read this dissertation and 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 (Honours) (Dietetics).

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## DECLARATION

I declare that this dissertation results from my investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or currently 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 purpose.



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Nurdini Athirah binti Ahmad Ridzuan

Date: 4 July 2024

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## **LIST OF ABBREVIATIONS**

BMI	Body Mass Index
USMKK	Universiti Sains Malaysia Kubang Kerian
KAP	Knowledge, Attitude, Practice
WHO	World Health Organization
PCOS	Polycystic Ovarian Syndrome
FFA	Free Fatty Acid
IR	Insulin Resistance
NHMS	National Health and Morbidity Survey
MANS	Malaysian Adults Nutrition Survey
MSG	Monosodium Glutamate
NCD	Noncommunicable Disease
BMR	Basal Metabolic Rate

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**PENGETAHUAN, SIKAP DAN AMALAN BERKAITAN DENGAN  
PENGAMBILAN MAKANAN RINGAN DALAM KALANGAN PELAJAR  
IJAZAH SARJANA MUDA SAINS KESIHATAN DENGAN INDEKS JISIM  
BADAN NORMAL DAN BERLEBIHAN/OBESITI DI USM KAMPUS  
KESIHATAN.**

**ABSTRAK**

Golongan muda mengambil lebih banyak makanan segera berbanding individu yang lebih tua. Pelajar universiti di negara membangun semakin banyak mengambil makanan segera sebagai sebahagian besar daripada diet mereka. Kehidupan universiti yang sibuk sering kali tidak memberi masa untuk merancang dan menyediakan makanan, menyebabkan pelajar memilih kemudahan makanan segera. Makanan ini tinggi lemak, gula, garam, kalori, dan pewarna tiruan tetapi rendah dalam nutrisi, menimbulkan risiko kesihatan. Kajian ini bertujuan untuk menilai pengetahuan, sikap, dan amalan (PSA) mengenai pengambilan makanan segera dalam kalangan pelajar sains kesihatan dengan status indeks jisim badan (IJB) normal dan berlebihan/obes. Kajian ini juga meneroka hubungan antara pengetahuan dengan sikap dan pengetahuan dengan amalan. Pendekatan keratan rentas digunakan, melibatkan 107 pelajar sains kesihatan. Peserta melengkapkan soal selidik dalam talian yang diakses melalui imbasan kod selepas berat dan tinggi mereka diukur. Keputusan menunjukkan bahawa 50.5% responden mempunyai IJB normal, manakala 49.5% berlebihan/obes. Kajian mendapati bahawa peserta mempunyai pengetahuan tinggi mengenai makanan segera, sikap negatif terhadapnya, tetapi masih mengambil makanan segera dengan tinggi. Membandingkan tahap PSA antara pelajar IJB normal dan berlebihan/obes, kajian mendapati tiada perbezaan yang signifikan dalam pengetahuan dan sikap antara kedua-dua kumpulan. Walau bagaimanapun, terdapat perbezaan yang signifikan dalam skor amalan, dengan pelajar IJB normal menunjukkan skor amalan yang lebih tinggi berbanding pelajar berlebihan/obes. Selain itu, tiada

hubungan yang signifikan antara pengetahuan, sikap, dan amalan terhadap pengambilan makanan segera untuk kedua-dua kumpulan. Kesimpulannya, pelajar sains kesihatan, walaupun menyedari kesan negatif makanan segera, tidak selalu menterjemahkan pengetahuan ini kepada tabiat pemakanan yang lebih sihat, terutamanya dalam kalangan mereka yang berlebihan berat badan atau obes. Untuk mengurangkan pengambilan makanan segera dengan berkesan, intervensi harus memberi tumpuan bukan sahaja pada meningkatkan kesedaran tetapi juga mengubah sikap dan tingkah laku untuk mempromosikan tabiat pemakanan yang lebih sihat dalam kalangan pelajar universiti. makanan ringan, menunjukkan bahawa pelajar dengan IJB normal mempunyai skor amalan yang lebih tinggi berbanding pelajar yang mempunyai berat badan berlebihan/obes. Selain itu, tiada hubungan yang signifikan antara pengetahuan, sikap, dan amalan terhadap pengambilan makanan ringan bagi kedua-dua kumpulan.

# **KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) OF JUNK FOOD CONSUMPTION AMONG NORMAL BMI AND OVERWEIGHT/OBESE UNDERGRADUATE HEALTH SCIENCE STUDENTS IN USM HEALTH CAMPUS**

## **ABSTRACT**

Young people consume more junk food than older individuals. University students in developing countries increasingly consume junk food as a major part of their diet. Busy university life often leaves little time for meal planning and preparation, leading students to choose the convenience of junk food. These foods are high in fat, sugar, salt, calories, and artificial colors but low in nutrition, posing health risks. This study aimed to evaluate the knowledge, attitudes, and practices (KAP) regarding junk food consumption among health science students with normal and overweight/obese body mass index (BMI) statuses. It also explored the relationship between KAP scores and sociodemographic characteristics. A cross-sectional approach was used, involving 107 health science students. Participants completed an online questionnaire accessed through a QR code after their weight and height were measured. Results showed that 50.5% of respondents had a normal BMI, while 49.5% were overweight/obese. The study found that participants had high knowledge about junk food, negative attitudes towards it, but still engaged in high consumption. Comparing KAP levels between normal and overweight/obese students, the study found no significant difference in knowledge and attitudes between the two groups. However, there was a significant difference in practice scores, with students of normal BMI showing higher practice scores compared to overweight/obese students. Additionally, there was no significant relationship between knowledge, attitude, and practice towards junk food consumption for both groups. In conclusion, health science students, despite being aware of the negative effects of junk

food, do not always translate this knowledge into healthier eating habits, especially among those who are overweight or obese. To effectively reduce junk food consumption, interventions should focus not only on increasing awareness but also on changing attitudes and behaviors to promote healthier eating habits among university students.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study

Nutrition optimally utilizes each energy and nutrient element in the precise amounts necessary for growth, development, and maintaining a healthy, efficient life, ensuring their nutritional value is preserved and they remain healthy (Onurlubaş & Yilmaz, 2013). Food is a nutritional delivery vehicle; it supplies energy for growth, acts as a structural component, and participates in all metabolic functions within the body (Rojekar *et al.*, 2019).

In 1848, the philosopher Ludwig Feuerbach proposed, "You are what you eat." In the 1970s, dietary patterns changed markedly, as more people moved from home-cooked meals to fast foods. This transition brought about a rise in (ultra)processed foods, greater use of highly refined edible oils, and an increase in sugar-sweetened beverages within the modern Western diet (Popkin, Adair & Ng, 2012; Singhal A, 2017). These dietary changes were accompanied by decreased physical activity and increased sedentary time, resulting in a significantly higher caloric intake than calorie consumption. This ratio, by definition, leads to weight gain, overweight (BMI > 25), and eventually obesity (BMI > 30) (Bodden, Hannan & Reichelt, 2021).

The global obesity rate tripled between 1975 and 2016. The dramatic effects on health and well-being were not clearly recognised until obesity, diabetes, metabolic syndrome, and cardiovascular diseases became the leading causes of death and morbidity worldwide (Bodden, Hannan & Reichelt, 2021). By the early twenty-first century, the typical Western diet had been identified as a major global health risk. This diet is distinguished by a high proportion of saturated fats, which are abundant in many animal products, as well as a



high proportion of simple 'refined' carbohydrates and sugars, primarily in the form of sucrose- or fructose-derived sweeteners (Bodden, Hannan & Reichelt, 2021). The World Health Organisation (WHO) emphasises the dangers of excessive intake of unhealthy foods and beverages, which is a major risk factor for noncommunicable diseases (NCDs). Junk food, sweetened and alcoholic beverages are among the foods associated with a high risk of metabolic syndrome, which is complicated by serious health consequences and even the risk of premature death in the case of long-term excessive consumption associated with an unbalanced and sedentary lifestyle (Singh *et al.*, 2021).

Junk food is defined as food with little nutritional value and is often rich in fat, sugar, salt, and calories. Junk food can have a negative impact on energy levels and mental well-being (Liu *et al.*, 2021). Large amounts of junk food consumption are linked to a significant decrease in the consumption of nutritious foods such as milk, fruits, and vegetables. Junk food include highly processed and packaged salty snacks, candy, and sweet desserts (Liu *et al.*, 2021). Although junk food is pleasant, it has little nutritional value and is heavy in calories (Rojekar *et al.*, 2019).

High revenue, growing urbanisation, free home delivery, delectable food commercials and foreign cuisines have contributed to an increase in junk food consumption (Subedi *et al.*, 2020). Societies' nutritional habits are thought to be influenced by socioeconomic, cultural, environmental, demographic, and psychographic factors. Personal lifestyle influences consumption behaviours, specifically decisions about how to spend one's time, energy, and money (Onurlubaş & Yilmaz, 2013).

The rising consumption of snack/meal bars, categorized into "cereal bars" and "nutrition bars," deserves closer examination. Despite often qualifying as junk food, these products enjoy a "health halo" due to successful marketing strategies. For instance, studies

indicate that consumers view energy/nutrition bars as healthier when the word "protein" is included in their names (Jensen & Schwartz, 2021).

Nutrition experts have concluded that junk food manufacturers deceive people by advertising their products as healthy. We must avoid junk food and replace it with healthier options like vegetables and fruits. Based on observations, educational interventions should be provided to university students to enhance their understanding of healthy food consumption (Singh *et al.*, 2020).

## 1.2 Problem statement

Changing eating habits over the last decade have resulted in nutritional snacks being substituted by junk food and worthless eating materials. The rising trend of urbanization, broad advertising on TV and in the media, appealing packaging, and parents' lack of nutrition understanding are cited as typical causes of increased junk food consumption. On the other side, because junk foods include a lot of sugar, salt, and fat, they can lead to chronic diseases including obesity, diabetes, and cancer later in life (Tavassoli *et al.*, 2015). Frequent fast food and takeaway meal intake has been linked to higher BMI and biomarkers of increased cardiometabolic risk (Janssen *et al.*, 2018).

University students' consumption of junk food has increased as their lifestyles have changed (Kumar Singh *et al.*, 2020). Significant life-changing transitions occurred when young persons graduated from high school and began college or a professional life. University, is a pivotal period for young adults in terms of eating choices and their association with weight gain. According to Stok *et al.*, (2018), college students gain more weight than individuals who do not attend university. It has been shown that after the transition from adolescence to young adulthood, when independency increases, young adults are continuously challenged to make healthful food choices. Along with unhealthy eating behaviors, a new series of weight-related behavioral patterns begins throughout this period (Sogari *et al.*, 2018).

Due to a lack of time and stresses, adult students migrating from schools to universities struggle to maintain healthy eating habits, and instead skip meals, eat unhealthy snacks, dine out, and consume fast food (Sogari *et al.*, 2018). There is a lack of awareness regarding healthy diet options, which may have a passive influence on eating habits and nutrition (Alzahrani *et al.*, 2020). The biggest issue of modern culture is the

consumption of too much junk containing artificial sweeteners, preservatives, MSG, and other chemicals that are damaging to our bodies and organs, causing complications to emerge at a young age. Obesity is becoming more common as the global environment changes, particularly among the metropolitan population (Begum, Singh S & Mohan, 2023).

### **1.3 Research Questions**

1. What is the level of knowledge, attitudes, and practices on junk food among normal BMI and obese/overweight students of the School of Health Science in the USM Health Campus?
2. Is there any difference in knowledge, attitude, and practice on junk food consumption between normal BMI and obese/overweight students of School of Health Science in USM Health Campus?
3. Is there any association between knowledge of junk food with attitudes towards junk food consumption among students of the School of Health Science in USM Health Campus?
4. Is there any association between knowledge of junk food with practice of junk food consumption among students of the School of Health Science in USM Health Campus?

#### **1.4 Research Hypothesis**

**Null Hypothesis (H0):** There is no significant difference in knowledge, attitude, and practice on junk food consumption between normal BMI and obese/overweight students of School of Health Science in USM Health Campus.

**Alternative Hypothesis (H1):** There is a significant difference in knowledge, attitude, and practice on junk food consumption between normal BMI and obese/overweight student of School of Health Science in USM Health Campus.

**Null Hypothesis (H0) :** There is no association between knowledge of junk food with attitude toward junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.

**Alternative Hypothesis (H1):** There is an association between knowledge of junk food with attitude toward junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.

**Null Hypothesis (H0) :** There is no association between knowledge of junk food with practice of junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.

**Alternative Hypothesis (H1):** There is an association between knowledge of junk food with practice of junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.

## **1.5 Study Objectives**

### **1.5.1 General objectives:**

To assess the knowledge, attitudes, and practices on junk food consumption among normal BMI and obese/overweight students of School of Health Science in USM Health Campus.

### **1.5.2 Specific objectives:**

1. To identify the knowledge, attitude and practice level on junk food among normal BMI and obese/overweight students of School of Health Science in USM Health Campus.
2. To determine the differences in knowledge, attitudes, and practices level on junk food consumption among normal BMI and obese/overweight students of school of health science in USM Health Campus.
3. To determine the association between knowledge of junk food with attitude toward junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.
4. To determine the association between knowledge of junk food with practice of junk food consumption among normal and obese/overweight students of the School of Health Science in USM Health Campus.

## **1.6 Significance of Study**

The purpose of this study was to identify students' knowledge, attitudes, and practises regarding junk food consumption in order to emphasise the potential health implications, particularly in terms of overweight and obesity. The findings of the study may contribute to the knowledge base for public health initiatives focused at reducing junk food intake among university students. These initiatives might focus on making educational institutions healthier especially health campus. It can draw attention to the link between these factors and the frequency of obesity among students. It gives useful information about students' eating habits, specifically their preferences for and relationship with junk food. This information can be useful in developing treatments and educational programmes to promote healthier eating habits in the future. The study's comparison approach between normal-weight and overweight/obese students enables a better understanding of the differences in junk food consumption knowledge, attitudes, and practises between these groups. It may reveal specific patterns or behaviours that contribute to weight-related problems



## CHAPTER 2

### LITERATURE REVIEW

#### 2.1.1 Definition of Junk Food

The more frequently the phrase 'junk food' is used, the more ambiguous its actual meaning becomes. In the literature, common definitions of junk food are based on nutrient composition, or combined nutrient composition and metabolic effect (Milani *et al.*, 2017). Production and environmental elements are occasionally included in the definition; alternatively, a raw list of food or junk brand names is reported to identify junk foods. Furthermore, the phrases 'junk' and 'unhealthy' food are occasionally used interchangeably (Milani *et al.*, 2017). Similarly, sugar-added and sweetened beverages, which are thought to play a negative effect on unhealthy eating habits, are labelled as 'junk food' in some cases and separately in others (Milani *et al.*, 2017). Junk foods are meals and beverages that are not required to offer the nutrients the body requires but may provide variety to a person's diet (Jia *et al.*, 2022; Milani *et al.*, 2017)

According to a recent WHO definition, junk foods are high in energy, low in nutrient content, and/or high in fat (some even contain trans-fats) snack foods that contain added sugar (such as sugary biscuits, cream-filled sponge cakes, candy, and fizzy drinks) or have a high salt content (such as fried potato crisps). This concept may apply to a wide range of foods whose composition is frequently dictated by industrial processing, such as packaged snacks and numerous fast foods. However, it includes the 'junk' category, which includes foods that are naturally high in fat and can have a high salt content due to processing or storage. For example, smoked salmon, caviar, or anchovies (Kavle *et al.*, 2015).

### **2.1.2 Impact of Junk Food on Health**

As the variety and consumption of junk foods expands, correspondingly rises the prevalence of overweight and obesity in the younger generation. This contributes to increasing public health issues. Due to peer pressure in their daily lives, students find it simpler to satisfy their hunger with junk food without realising the consequences for their health. This, however, is not the only cause of obesity. Precocious puberty, early menopause, polycystic ovarian syndrome (PCOS), infertility, cardiovascular problems, hypertension, and diabetes mellitus are examples of noncommunicable disorders (Hassanzadeh *et al.*, 2012).

According to one study (Goldfine and Kahn, 2003), junk food may contribute to female obesity by interfering with the hormonal systems that regulate hunger and appetite. Junk food contains free fatty acids (FFAs), which are formed by adipocytes and are linked to lipotoxicity and increased insulin resistance (IR). Obese people secrete less adiponectin than adults with a normal BMI. Adipocytes, also known as lipocytes or fat cells, generate a variety of cytokines that cause IR, which is linked to PCOS and other metabolic disorders (Begum *et al.*, 2023).

Obesity and junk food consumption are inextricably linked to hormones. Despite health risks and dysregulation of neuroendocrine, autonomic, immune, and metabolic system mediators, junk food and environmental stress increase prevalence of obesity and metabolic syndrome. There is a link between today's youth culture and junk food, which leads to obesity and associated problems. It has already been established that eating junk food regularly and in large quantities leads to bingeing and overeating without reaching satisfaction and limiting the quantity of energy ingested (Begum *et al.*, 2023).

### 2.1.3 Overview of Obesity Worldwide

Obesity is a multifaceted disease. Since 1980, the global prevalence of overweight and obesity has more than doubled, with over a third of the world's population being categorised as overweight or obese (Chooi *et al.*, 2019). Globally, the prevalence of overweight and obesity has risen dramatically over the past 50 years, and sedentary lifestyles and dietary modifications are thought to be some of the primary contributing factors to this pandemic (Blüher, 2019). Overweight and obesity are defined by the World Health Organisation (WHO) as abnormal or excessive fat accumulation that may have negative health effects. According to estimates from the World Health Organisation, 39% of adults worldwide are overweight, and 13% of adults worldwide are obese. Most European countries are seeing an increase in the prevalence of obesity, which is expected to reach between 13% and 43% by 2025, with 33 of the 53 countries expected to have a prevalence of obesity of 20% or higher (Pineda *et al.*, 2018). The highest prevalence (43%) and lowest prevalence (13%) are expected to be found in Italy and Ireland, respectively (Romero-Blanco *et al.*, 2021).

Over the last five years, obesity rates among adults in Malaysia have continued to rise, although the National Health and Morbidity Survey Malaysia (NHMS) of 2011 and 2015 indicated a slower rate of increase. According to these surveys, the prevalence of overweight adults in Malaysia was 29.4% in 2011 and 30.0% in 2015, while the rates of obesity were 15.1% and 17.7% respectively. According to a study conducted by Pital and Ghazali (2022), overweight and obesity rates are increasing across Asia, with Malaysia leading this trend. However, recent data specific to young people, especially university students in Asia, are limited. According to the Asian cut-off scale, out of 622 participants aged 18-24 years, the prevalence of overweight was 22.19% and obesity was 16.88%. The study sample showed a notably high prevalence of overweight and obesity, particularly

among male students. Bachelor's degree students had higher BMIs compared to those at the associate level. Age groups played a significant role in the prevalence of overweight and obesity among males, although this trend was not observed among females (Pitil & Ghazali, 2022).

The National Health Morbidity Survey II in 1996 reported that 16.6% of the adult population were overweight and 4.4% were obese. A subsequent study suggested higher rates of 20.7% overweight and 5.8% obese among individuals aged 20 years and older. Six years later, the Malaysian Adults Nutrition Survey (MANS) conducted between October 2002 and July 2003 found a significant increase in obesity prevalence, with the number of overweight adults rising by over 60%. This rapid rise was confirmed by another study in 2004. The Third National Health and Morbidity Survey (NHMS III) in 2006, involving 33,055 adults, reported that 29.1% were overweight and 14.0% were obese. By 2011, the subsequent NHMS showed a slight increase in overweight and obese rates, suggesting a potential plateau in the rising trend.

There are hereditary and non-genetic components linked to increased body weight. Through epigenetic pathways, certain non-genetic factors, such as eating habits, might modify a person's genetic susceptibility to obesity. It has been observed that individuals who consume more high-fat foods or sugary beverages have larger genetic connections with obesity. Consequently, as irregular eating habits are one of the primary causes of overweight and obesity, therapies aimed at reducing obesity must address this issue (Romero-Blanco *et al.*, 2021).

Obesity rates have increased across all ages and genders, regardless of geographic location, ethnicity, or socioeconomic class, however the prevalence of obesity is often higher in older people and women. Although the absolute prevalence rates of overweight and obesity varied greatly across areas and countries, this tendency was consistent.

Obesity prevalence rates in various wealthy countries appear to have leveled off in recent years (Chooi *et al.*, 2019).

Obesity has reached pandemic proportions on a global scale. By 2030, it is anticipated that two billion people would be overweight and one billion will be obese (Lee, 2019). Changes in the global food system, together with sedentary behaviour, are commonly regarded as the primary drivers of the global rise in obesity prevalence. Obesity prevalence appears to be increasing faster in middle-income countries around the world (Blüher, 2019).

#### **2.1.4 Food Determinant and Eating Behaviours among University Students**

In the current study, food determinates that influenced students' dietary patterns included time restrictions, food availability, cost, and meal kind. In such a case, the time issue is linked to food availability, and the two may influence meal choice as outlined in Shepherd's food choice model (Shepherd, 1999). A qualitative study conducted among international students in British universities to investigate their dietary experiences found that busy schedules on weekdays resulted in more missing meals due to the limited time available for cooking (O'Sullivan & Amir Abdollahian, 2016). Full academic schedules, assignment matters, and students' fear of academic failure may be the primary reasons for time constraints, and students would prioritise their studies over their diets (Manal Amro Al Mughamsi and Khairi, 2023).

Regarding the various eating behaviours, it was discovered that the consumption of food/snacks combined with energy or carbonated drinks while watching television as well as playing videogames (or) games on mobile phones was considerably greater among the obese and overweight university student. The more time spent inactivity and

immobility when watching television, playing videogames (or) games on mobile phones, and eating/drinking unhealthy food, the less likely the individual is to engage in any form of physical exercise. Energy drink use has become a popular practice among college students. In the same survey conducted by, it discovered that more than a quarter of the obese and overweight students consumed energy drinks on a daily basis. The likely cause of our students' excessive consumption of energy drinks is the semester's strict and tight schedule, with intense and stressful situations emerging as a result of frequent tests, pop quizzes, assignments, and project work. Exam stress has a significant influence on students' eating habits (Kabir *et al.*, 2018).

According to a study conducted by Jun Chen *et al.*, students with lower BMI (23.0kg/m<sup>2</sup>) consumed mostly grain products, meat products, and vegetables on a daily basis, whereas fast food, rapid food, and confections were the least eaten food on a daily basis. In contrast to the findings on students with higher BMI (23.0kg/m<sup>2</sup>), meat products, sweet drinks, confections, and fast food were the most eaten food daily, while vegetables and fruits were the least consumed food daily (Jun Chen *et al.*, 2021). A prior study conducted in the United States also found that people with higher BMI snack substantially more frequently in the evening, which is more harmful to their health than snacking during the day (Barrington & Beresford, 2019).

In addition to eating for survival, today's society also consumes a lot of food for enjoyment. Certain foods are made us eat them even when we're not hungry because they show up in commercials or because of positive experiences with them in the past. Food addiction refersto this craving for particular foods that is characterised by a preference for extremely appetising and enjoyable foods. These foods' pleasurable effects on the reward circuits are similar to those of other addictive substances like alcohol or opioids (Romero-Blanco *et al.*, 2021).

### **2.1.5 Knowledge, Attitude and Practice of Fast Food Among University Student**

The study conducted by Azman *et al.*, (2020) discovered that both normal and overweight students had a high level of knowledge about fast food intake. It is because the responders were science-based students who learnt about anatomy and physiology and side effects of dietary intake to the body. As a result, they were able to identify the influence of fast food consumption on physical health regardless of whether they were normal weight or overweight/obese. According to a study conducted by Thamarai, *et al.*, (2015), medical students recognised the effects of improper food consumption on the body. Furthermore, according to Hoffmann and Lutz (2019), education is highly related with a healthy lifestyle. Good information impacted a person to be more vigilant in controlling their lives, including their food intake. As a result, it demonstrates that the health education-based study can influence the students' level of understanding.

From the same study conducted by Azman *et al.*, (2020), both normal and overweight/obese groups have the same amount of attitude, which is positive. The definition of positive attitude pertains to negative beliefs about fast food consumption. The majority of respondents thought that the negative impacts of fast food outweighed the benefits. This discovery was distinct from the findings of a study conducted by Karimy *et al.*, (2019), mothers with normal weight children outperformed mothers with overweight/obese children. However, it can be further reinforced by Martye *et al.*, (2017), who said that there is no change in food preferences between normal and overweight/obese children. They seemed to have the same attitude.

Furthermore, Azman *et al.*, (2020) found that when compared to normal weight students, overweight/obese students were much more nutrition-focused. The degree of

practice for normal and overweight pupils was similar, with no significant difference. The outcome was contradicted by the earlier study by Abraham *et al.*, (2018) found that the practice level of overweight/obese students was higher than that of normal weight students. However, this contradicts the findings of a study conducted by D'Addesa *et al.* (2010), which found that normal weight adolescents consume more food than overweight/obese adolescents. However, this group engaged in more physical exercise at the same time. As a result, the extra energy input can be adjusted by physical exercise.

Azman *et al.*, (2020) found that in his studies, high levels of knowledge did not influence students' attitudes towards fast food consumption. It differs from the previous study's finding by Choi (2007), which found that knowledge level was positively connected with dietary attitude level. Furthermore, it contradicts the study by Shabanian *et al.* (2018), who discovered that students' attitude scores increased after enhancing their knowledge level through schooling. Aside from that, the current study's results differ from those obtained by Allen *et al.*, (2014). According to Allen *et al.*, (2014), higher levels of knowledge obtained through schooling improved students' attitudes. Furthermore, the results of this study contrast from the earlier study by Min *et al.*, (2018), which showed that nutritional awareness can influence the The reason could be that the students are in denial that fast food consumption is unhealthy, or that their addiction to fast food has influenced their unfavourable attitude, despite having an high level of knowledge regarding fast food consumption. Furthermore, peer pressure could be one of the reasons for the negative attitude. In order to feel accepted by their peers, they choose to eat similar foods, such as fast food.

Students who had a high level of education consumed less fast food. This finding contrasted with a study by Onurlubas and Yilmaz (2013), which found that 97.4% of students continued to consume fast food despite their extensive knowledge of the risks.



However, it is corroborated by Nani (2016), who indicated that higher nutrition education affected college students to make healthier eating choices. Parmenter *et al.*, (2000) provides additional support, stating that there is a link between knowledge and practice of healthy eating. It suggests that having more knowledge about food consumption influenced an individual's food intake practices. Furthermore, Kolodinsky *et al.* (2017) reported that nutritional awareness affects meal choices.

## 2.2 Conceptual Framework

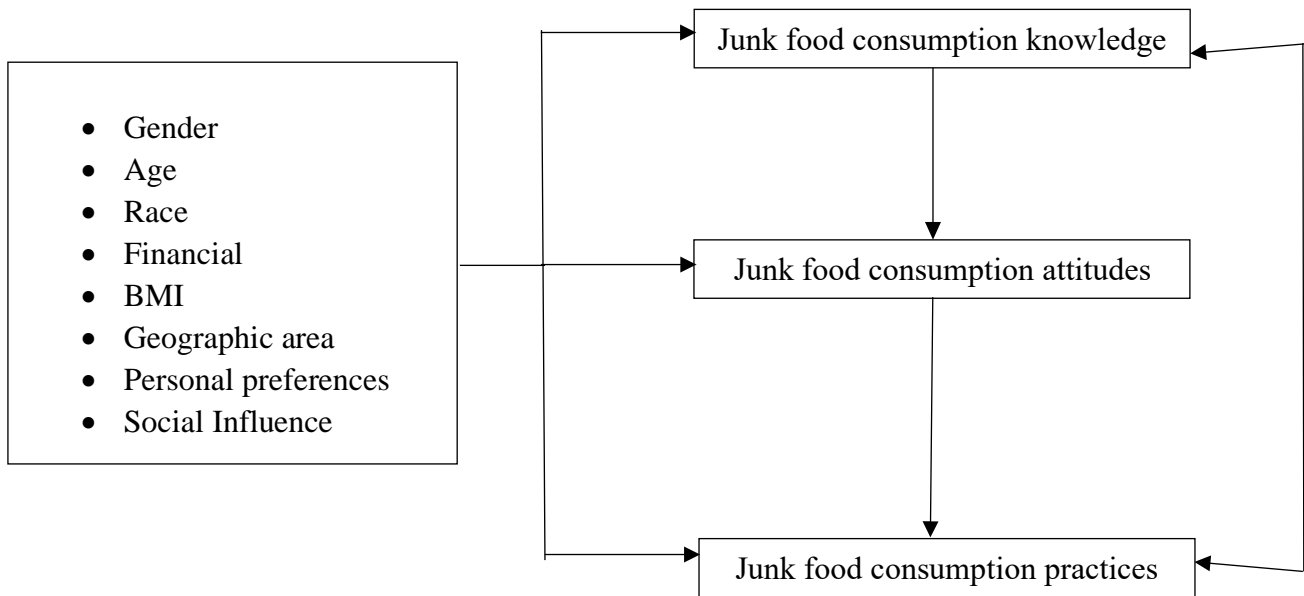


Figure 1: Conceptual Framework

Generally, knowledge, attitudes, and practices (KAP) level of junk food consumption can differ among normal and overweight/obese student. In this framework, there are several independent variables including gender, age, race, financial status, BMI, geographic area, personal preferences and social influences while the dependent variables are knowledge, attitude and practices (KAP) level of junk food.

## CHAPTER 3

### METHODOLOGY

#### 3.1 Research design

This study implemented a cross-sectional study. This research was carried out using a set of self-administered questionnaires through online Google form. The questionnaire was constructed using questions from previous studies to assess the knowledge, attitudes, and practices on junk food consumption among university students in USM Health Campus. A cross-sectional study was observational study in which data from a population was analysed at a specific point in time. They were frequently used to assess the prevalence of health outcomes, comprehend health factors, and describe demographic characteristics (Kesmodel, 2018). The chosen participants were based on inclusion and exclusion criteria. Furthermore, data was collected concurrently at a single point in time, eliminating the need for subjects to be followed up on as in other longitudinal studies. This study was conducted in accordance with the highest ethical standards.

### 3.2 Study area

This study was conducted in Kubang Kerian, Kelantan. This study focused on undergraduate health science students from Universiti Sains Malaysia (USM), Health Campus, Kelantan. The measuring of height and weight was conducted physically in Desasiswa Murni 4 and Pusat Mahasiswa in USM Health Campus. The Universiti Sains Malaysia (USM) Health Campus is located on Malaysia's East Coast, in the town of Kubang Kerian, Kelantan, which is known for its chaos, but it also offers numerous health courses and training for future doctors and practitioners in the country. Kubang Kerian has emerged as a new economic centre in Kelantan. Since 1983, the establishment of the USM Health Campus in Kubang Kerian has attracted additional industries, which has helped to enhance the local economy. Kubang Kerian has a new fresh market and street food. There are numerous restaurants, including bakeries, KFC, McDonald's, Domino's, Pizza Hut, Subway, and Old Town White Coffee within 1 km from USM. It is a very strategic location to select participants because the proximity of fast food and junk food shops near the USM Health Campus is evident. These cafes provide a quick choice for students to meet the demanding schedules full of courses, assignments, and extracurricular activities. These facilities might influence junk food consumption among undergraduate health science student from USM. Ample options for fast food and junk food available around the USM health campus and it is often considered to have a diverse food preference in food choices for the students. Many students operate on tight budgets, and fast food establishments often provide cost-effective meal choices. Deals, discounts, and value meals make these options appealing, especially for those with limited financial resources. The easy availability of these options might contribute to poor dietary habits among students, potentially affecting their overall well-being.

### **3.3 Study Population**

The study population in this study was student from School of Health Science USM Health Campus. At the Universiti Sains Malaysia (USM) Health Campus, a wide range of courses related to health sciences are offered, catering to various disciplines within the field of healthcare. The student from various courses from School of Health Science are selected including Dietetics, Nutrition, Forensic Science, Exercise and Sport Science, Biomedicine, Medical Radiation, Audiology, Nursing and Speech Pathology from year 1 to year 4. University students are more willing than older generations to change their eating habits and are more environmentally conscious (Aguirre Sánchez *et al.*, 2021).

### **3.4 Subject Criteria**

Subject selection is based on inclusion and exclusion criteria.

#### **3.4.1 Inclusion Criteria**

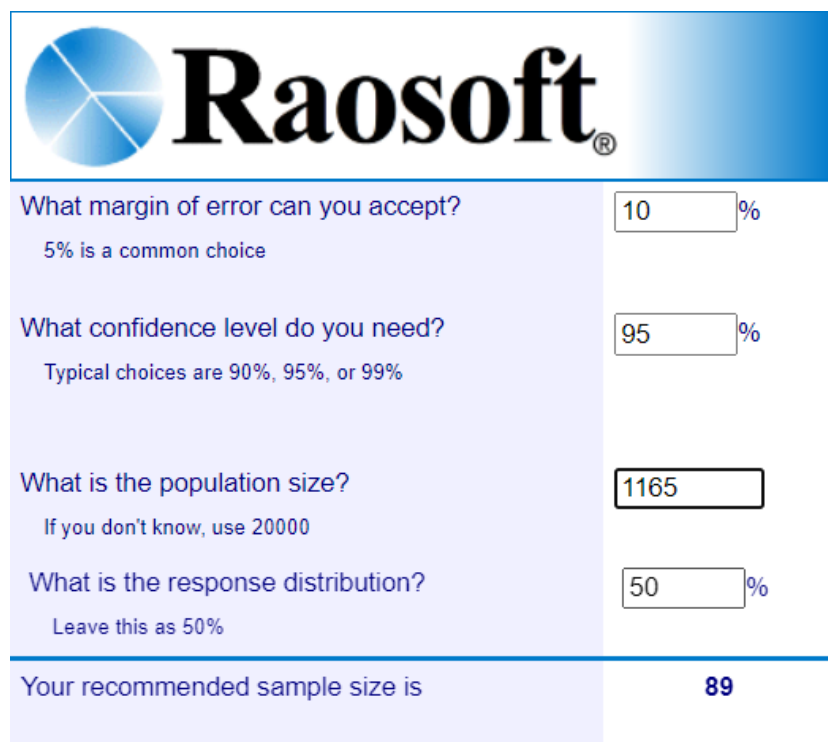
- a) Individual aged 18 and above.
- b) Undergraduate student who is currently studying in USM Health Campus.
- c) Normal and overweight/obese individual.
- d) Malaysian citizenship.

#### **3.4.2 Exclusion Criteria**

- a) Foreign citizenship.
- b) Underweight student.
- c) Participant with known health conditions (diabetes, hypertension, hyperlipidemia)

### 3.5 Sample Size Estimation

The sample size was calculated using the Raosoft sample size calculator with a known population. The study's target population consisted of students from the School of Health Science at Universiti Sains Malaysia Kubang Kerian. According to data provided by the Department of Student Affairs (BHEPA) USMKK for total current students from School of Health Science 2023, the total statistic number of students in the School of Health Science was 1165. According to Figure 3.2 (confidence interval = 95%, margin of error = 10%), the required sample size for the population of estimated 1165 is 89 responses. This value was 50% of the population.



The image shows a screenshot of the Raosoft sample size calculator. The interface is blue and white. At the top left is the Raosoft logo, which consists of a blue circle with a white pie chart inside, followed by the word "Raosoft" in a bold, black, sans-serif font. Below the logo, there are four input fields with corresponding labels and a final output field. The first field is labeled "What margin of error can you accept?" with a sub-note "5% is a common choice" and a text input box containing "10". The second field is labeled "What confidence level do you need?" with a sub-note "Typical choices are 90%, 95%, or 99%" and a text input box containing "95". The third field is labeled "What is the population size?" with a sub-note "If you don't know, use 20000" and a text input box containing "1165". The fourth field is labeled "What is the response distribution?" with a sub-note "Leave this as 50%" and a text input box containing "50". At the bottom, there is a final field labeled "Your recommended sample size is" with a bold black number "89" next to it.

Question	Answer
What margin of error can you accept? <small>5% is a common choice</small>	10 %
What confidence level do you need? <small>Typical choices are 90%, 95%, or 99%</small>	95 %
What is the population size? <small>If you don't know, use 20000</small>	1165
What is the response distribution? <small>Leave this as 50%</small>	50 %
Your recommended sample size is	<b>89</b>

Figure 2: Sample Size Calculation

Therefore, from the calculations, the sample size required is 89. By considering drop-out rates 20%, the final total respondents required for this study is:  $89 + (89 \times 0.2) = 107$  participants.

### **3.6 Sampling Method & Subject Recruitment**

The convenience sampling approach was used to recruit the samples. Convenience sampling is a type of non-probability sampling. All subjects were chosen voluntarily. Undergraduate students who meet the inclusion criteria, willing to volunteer, and interested in participating in the study were selected to engage in the research. They were required to read the research information, sign the consent form, and complete the questionnaire. The first 107 students who voluntarily completed the questionnaire were chosen.

### **3.7 Research Tools**

In this study, data was collected using a set of verified previous studies questionnaires adapted from a journal article (Azman *et al.*, 2020; Subedi *et al.*, 2020) about knowledge, attitude, and practice of junk food consumption. Each questionnaire set was divided into five sections: demographic data, BMI status, knowledge, attitudes, and practices. This questionnaire was originally made in English, no translation was made into Bahasa Malaysia as the study population was using English in their studies and it indicated that they can understand English well. The questionnaire was intended to take about 20 minutes to complete.

#### **Part I : Demographic Data**

The demographic data for the questionnaire are gender, age, race and financial aids (parents, scholarship, loan, others).