

**UNDERSTANDING THE REASONS BEHIND INADEQUATE DAILY
INTAKE OF FRUITS AND VEGETABLES IN FINAL YEAR NUTRITION AND
DIETETICS STUDENTS: A QUALITATIVE RESEARCH**

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DIETETICS STUDENTS: A QUALITATIVE RESEARCH**

by

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**Dissertation submitted in partial fulfilment of the requirements for the
degree of Bachelor in Nutrition with Honours,
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JANUARY 2025

CERTIFICATE

This is to certify that the dissertation entitled “Understanding the Reasons Behind Inadequate Daily Intake of Fruits and Vegetables in Final Year Nutrition and Dietetics Students: A Qualitative Research” is the bona fide record of research work done by Athirah Zarith Sofea Binti Ahmad Mahfuz during the period of March 2024 until January 2025 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 fulfilment for the degree of Bachelor in Nutrition with Honours.

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DECLARATION PAGE

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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Date: 11 JANUARY 2025

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LIST OF ABBREVIATIONS

FV: Fruits and vegetables

UKM: Universiti Kebangsaan Malaysia

USM: Universiti Sains Malaysia

WHO: World Health Organization

ABSTRAK

Buah-buahan dan sayur-sayuran (FV) merupakan sebahagian penting daripada diet yang sihat. Mengikut Garis Panduan Pemakanan Malaysia (2010), individu perlu mengambil sekurang-kurangnya lima hidangan FV setiap hari. Ini bersamaan dengan dua hidangan buah dan tiga hidangan sayur yang juga selaras dengan saranan WHO 2003. Berdasarkan bidang pengajian dan sifat kursus mereka, pelajar tahun akhir yang mengikuti program Pemakanan dan Dietetik, sepatutnya mempunyai tabiat pemakanan yang lebih baik berbanding dengan rakan sebaya yang lain. Namun, terdapat kajian menyatakan bahawa walaupun pelajar mempunyai pengetahuan sains pemakanan yang tinggi, ini tidak semestinya akan mempengaruhi tabiat pemakanan mereka ke arah yang lebih sihat disebabkan terdapat pelbagai faktor yang menjadi penghalang. Oleh itu, objektif utama kajian ini adalah untuk memahami pengambilan harian FV dan sebab-sebab jika pengambilan FV tidak mencukupi di kalangan pelajar tahun akhir Pemakanan dan Dietetik. Untuk mencapai objektif kajian, proses temubual borseorangan telah dilaksanakan dalam Zoom dengan 11 peserta perempuan tahun akhir Pemakanan (n=7) dan Dietetik (n=4). Masa temubual adalah lebih kurang sejam bagi setiap orang. Temubual dilaksanakan untuk mengenalpasti pengambilan, pengaruh dan halangan terhadap pengambilan FV yang mencukupi. Transkrip yang terhasil daripada temubual yang dirakam telah disemak sebelum proses analisis bertema dijalankan. Tema dan subtema terhasil daripada analisis termasuklah; kekurangan pengambilan FV dalam pemakanan harian, persepsi dan pandangan peribadi terhadap pengambilan FV, kekangan persekitaran terhadap tabiat pemakanan, kekurangan kepelbagaian dan bekalan FV serta halangan lain dalam mengamalkan pemakanan sihat, dan cadangan untuk meningkatkan

pengambilan FV. Kesimpulannya, kajian ini mendapat terdapat pelbagai faktor yang menyebabkan pelajar mempunyai pengambilan harian FV yang tidak mencukupi.

ABSTRACT

Fruits and vegetables (FV) are a vital part of a healthy diet. According to the Malaysian Dietary Guidelines (2010), individuals should consume at least five servings of FV daily. This equates to two servings of fruits and three servings of vegetables, echoing the WHO 2003 recommendations. Based on their study area and nature of the degree, the final-year students enrolled in Nutrition and Dietetics programmes are expected to have better eating habits than their peers. However, studies found that students with high nutritional knowledge do not necessarily translate to healthy eating habits due to various factors and challenges. Therefore, the main objective of this study is to understand the reasons behind intake of FV in final-year Nutrition and Dietetics students. Individual interview sessions using Zoom were conducted with 11 female final-year students of the Nutrition (n=7) and Dietetics (n=4) programme. Interview time took approximately an hour per person. The interviews were conducted to uncover the influences, barriers and opinions that influenced their current daily intake of FV. The interviews were recorded and transcribed and checked before the thematic analyses. The themes and subthemes include; the current lack of dietary FV intake, personal perceptions and feelings towards FV intake, limitations in surroundings on eating habits; insufficient FV variety and availability and other barriers to practising healthy eating habits; and suggestions on improving FV intake. In conclusion, the study found that various factors cause participants to have inadequate daily intake of FV.

CHAPTER 1: INTRODUCTION

1.1 Background of Study

Fruits and vegetables (FV) are a vital part of a healthy diet. The nutrient content of different types of FV varies greatly and hence, it is advised to eat a variety of them (Ikram & Rohadi, 2019). FV are widely acknowledged as vital elements of a nutritious diet because of their diverse range of nutrients, which includes dietary fibre, vitamins, minerals especially electrolytes like potassium, calcium, and magnesium, and a range of phytochemicals that differ significantly between different fruit and vegetable varieties (Kaewpradup *et al.*, 2024). The authors further stated that these foods play a critical role in reducing the risk of several chronic diseases, including high blood pressure, lipid imbalances, and raised blood sugar, as well as in preventing oxidative stress.

In 2003, the World Health Organization (WHO) advised the public to consume 400 grams of fruits and non-starchy vegetables daily, which is equivalent to five servings—two servings of fruit and three servings of vegetables—per day (WHO, 2003). This recommendation stands till today. Higher consumption of FV is linked to decreased inflammation and a decreased risk of developing chronic illnesses such as diabetes, heart disease, stroke, cancer, and all-cause mortality, (Wallace *et al.*, 2020). Promoting daily FV intake is one of the most crucial parts of a healthy diet, as it helps avoid adult non-communicable diseases and malnutrition (NHMS, 2019).

From Alam and colleagues' work (2019) and the Malaysian Dietary Guidelines (2010), it was recommended that adults should consume a minimum of five portions, or servings, of FV per day. This equates to two servings of fruits and three servings of

vegetables, or 400 g of a variety of non-starchy fruits and vegetables, echoing the WHO 2003 recommendations. Nonetheless, according to Chekima et al. (2022), about 95% of adult Malaysians do not eat the necessary daily amounts of FV. In 2011, just 7.5% of adult Malaysians reported consuming enough FV, and by 2015, the prevalence had remarkably dropped to 6.0% (NHMS, 2011; NHMS 2015).

Research by Ikram & Rohadi (2019) reported that the consumption of FV was low in adolescents and was even lower between the ages of 18 and 25, which is also referred to as the transitional period between adolescence and early adulthood (Stok *et al.*, 2018). According to a study done at a Saudi institution, very few students adhered to the WHO's recommendations for the intake of FV (Ikram & Rohadi, 2019). Additionally, another global study that revealed 66% to 95% of students consume fewer than five servings of FV each day (Hartman *et al.*, 2013). This data was supported by a study done at UiTM Selangor, where just 18.4% of students met the criterion of eating at least two servings of fruit each day, while 81.6% of students did not (Ikram & Rohadi, 2019). There were 54.1% of students that did not meet the daily requirement of eating three servings or more of vegetables (Ikram & Rohadi, 2019). Among participants who were 18 years of age and older, the average fruit intake was 1.4 servings, while the average vegetable intake was 1.5 servings (Ikram & Rohadi, 2019).

The period of transition from adolescent to adulthood is crucial for establishing food habits that will impact one's long-term health. Research indicated that young adults face ongoing challenges in selecting appropriate foods as their independence grows during the transition from adolescence to early adulthood (Stok *et al.*, 2018). People starting university are starting to live independently (Abraham, 2018). During these years,

students' diet and exercise habits typically develop or alter. It is crucial to develop healthy eating habits during this period since once formed, these habits may be very difficult to break and frequently last into adulthood. Therefore, because food alternatives change and dietary issues occur as people move from home to university, nutritional education becomes increasingly crucial. For university students, developing healthy eating habits may help them achieve optimal performance and having good health is highly advantageous. Thus, students of Nutrition and Dietetics degree programmes will have greater advantages in establishing good eating habits especially those who are in their final year of studies as they will have higher nutritional knowledge compared to others. Prior research has indicated that students' food intake is impacted by nutrition knowledge and improves as their studies progress, where the findings highlight dietary intake changes over time among dietetics students (Verwey, Jordaan & Wenhold, 2022).

Given their field of study and the nature of the coursework, university students enrolled in programs related to health and food, such as Nutrition and Dietetics, are expected to have better eating habits than those of their peers, according to a study by Yolcuoğlu & Kızıltan (2022). Furthermore, considering their future career, the students are expected to educate people regarding health and nutrition. Therefore, they should have good eating habits themselves in order to give the best and applicable advice during their work life. However, Medina and colleagues (2020) and Popiolek-Kalisz et al. (2024) stated that although students have good nutritional knowledge, it does not necessarily translate into healthy eating habits. This may be due to various factors and reasons that act as barriers for the students to practice healthy eating habits. Hence, this study aims to understand in-depth the possible reasons and barriers behind poor FV intake in Nutrition

and Dietetics students despite having high nutritional knowledge and knowing its important to health.

1.2 Problem Statement

Eating habits play a significant role in life because they have the potential to impact long-term health outcomes. Poor eating habits, such as consuming insufficient amounts of FV each day, can lead to a number of health issues, pertaining to increasing risk of obesity and overweight (Wallace *et al.*, 2020). On the other hand, having a well-balanced diet and consuming high-quality food can support people's mental and physical stability (Hilger, Loerbroks & Diehl, 2017). A nutritious diet has a big impact on the lives of university students that are a large population that may be imbedded these healthy habits to prevent a variety of health issues (Kabir, Miah & Islam, 2018). As Nutrition and Dietetics students, especially the final year students, gain more nutritional knowledge due to years of studying, they are expected to have good eating habits. This notion is, however, refuted by a prior study that demonstrates that, despite the students enrolling in those courses and attaining a high level of nutritional knowledge, there are still gaps between knowledge and its application (Medina *et al.*, 2020). They added that these might be the results of additional elements of campus life that exist where the influence may outweigh the knowledge of healthy eating. Therefore, in this study, I aim to conduct a qualitative study to understand in-depth their barriers towards adequate consumption of FV. This will be done by conducting individual interviews from the final-year Nutrition and Dietetics students. This is to obtain an understanding behind possible inadequate daily intake of FV despite having the high nutritional knowledge. Thus, hopefully their insights can be utilized to provide better understanding on how to improve eating habits and thus, producing better nutritional consultations in the future. Furthermore, the result of this

research may also help in developing better intervention for people who have poor eating habits especially in having inadequate daily intake of FV, including those with poor nutritional knowledge.

1.3 Research Questions

There were a few questions in this research involving final-year Nutrition and Dietetics students and their inadequate daily intake of FV. Among the questions are:

- i. What are the current dietary practices in relation to knowledge level in final-year Nutrition and Dietetics students?
- ii. What are the participants' perceptions and feelings towards their intake of fruits and vegetables?
- iii. How may the environment influence a person's eating habits?
- iv. What are the possible barriers or challenges to practice healthy eating habits?
- v. What are the insights and opinions regarding application of nutritional knowledge learnt to improve daily intake of fruits and vegetables?

1.4 Research Objectives

1.4.1 General Objective

To understand the reasons behind inadequate daily intake of fruits and vegetables in final-year Nutrition and Dietetics students.

1.4.2 Specific Objectives

- i. To understand the current dietary practices in relation to knowledge level in final-year Nutrition and Dietetics students.
- ii. To explore the participants' perceptions and feelings towards their intake of fruits and vegetables.

- iii. To explore how the environment may influence a person's eating habits.
- iv. To understand the possible barriers or challenges to practice healthy eating habits.
- v. To obtain insights and opinions regarding application of nutritional knowledge learnt to improve daily intake of fruits and vegetables.

1.5 Study Justification

This qualitative study aims to uncover the reasons behind inadequate daily intake of FV among final-year Nutrition and Dietetics students in Malaysia. To the best of the researcher's knowledge, there is a lack of literature on this topic, particularly on the specific demographic, both within and outside of Malaysia, which makes these findings valuable. Students enrolled in the Nutrition and Dietetics programme, are expected to have an advantage over students in other fields of study when it comes to the acquisition and learning of nutritional concepts (Yolcuoğlu & Kızıltan, 2022). They will also be better equipped to adopt healthy eating habits. As a result, it will be expected that these students will be able to use the knowledge they have learned to impact the way they eat and live (Yolcuoğlu & Kızıltan, 2022). Furthermore, this expectation is extremely high especially for those in the final year as they also will advocate health through healthy eating in their working life.

Therefore, proper research needs to be done to understand in-depth their barriers to daily intake of FV despite having high nutritional knowledge. Although there is already research done similar to this study, they still present inadequate findings. For instance, a study conducted in Puerto Rico by Medina et al. (2020) included a comparable demographic, namely students engaged in academic programs that provide nutrition

information, such as the Nutrition and Dietetics program. This quantitative study aims to assess the relationship between students' eating habits and nutritional status in academic programs with knowledge of nutrition and cooking techniques. It can only contribute to the findings that, despite their high level of nutritional knowledge, students still have poor eating habits, such as not getting enough FV each day (Medina *et al.*, 2020). A quantitative study on a related topic was also conducted in Malaysia by Ikram & Rohadi (2019), with the exception the participants were students studying health sciences, including dietetics. This study demonstrated that Malaysian students also do not consume enough FV on a regular basis (Ikram & Rohadi, 2019). Although research on this topic has been conducted, it is done in quantitative settings, which makes it difficult to fully understand the causes of students' insufficient daily intake of FV, particularly in Malaysia. Having comprehensive knowledge about the barriers is crucial for creating appropriate and successful strategies for intervention that address the issue. Therefore, by conducting this study, the findings may help to contribute to the existing body of knowledge by providing in-depth findings regarding this topic that can be utilised by any related parties in the future.

1.6 Significance of Study

The purpose of this study is to understand the views and perceptions on why final-year Nutrition and Dietetics students do not consume adequate FV on a daily basis. Currently, there are limited research in Malaysian university students on this subject compared to the large amount of literature created abroad, especially so from qualitative studies. Thus, this study will address the knowledge gap and provide valuable information to help policymakers and program managers address and overcome these issues.

This research is qualitative research design, and the interviews will aid in gathering perspectives and insights on this topic. Gaining a better understanding of the factors influencing poor eating habits is vital and this will assist to design interventions more effectively to improve bad eating habits especially the inadequate consumption of FV.

Furthermore, the overview offered in this study will push for new ideas and awareness among the students themselves regarding the reasons which lead to their current eating habits. This will help them to be more aware and identify the problem and thus lead to improvement among themselves in order to gain optimum health through good eating habits and adopting healthy lifestyles. It is hoped that this study can increase the awareness of healthy lifestyles and eating among young adults, thereby reducing the risks of developing chronic diseases.

CHAPTER 2: REVIEW OF LITERATURE

2.1 Prevalence of daily FV intake among Malaysian university students

The WHO (2003) and the Malaysian Dietary Guidelines (MDG) (2010) recommend consuming five servings of FV daily. This is equivalent to 400 g of a range of non-starchy fruits and vegetables, or two servings of fruits and three servings of vegetables. Based on the National Health and Morbidity (NHMS) (2023) report, 95.1% of adult Malaysians do not consume the daily recommended intake of FV. Young people in the age range of 20 to 29 have the second highest prevalence of inadequate FV consumption (91%) of any age group, only behind the 18 to 19 years age group. Research in Malaysian university students support this prevalence, showing that just 2% have a good diet, which includes eating adequate amounts of FV each day (Ayob & Shukri, 2020). Parallel findings are also found in a study conducted among Malaysian healthcare university students, which revealed that very few of the participants' daily diets contained adequate amounts of FV and that none of the participants had good diet quality (Lee *et al.*, 2023).

According to the results of the available study, Malaysian university students frequently fall short of the recommended intakes of FV and do not satisfy the daily requirement for FV as suggested by the MDG (Ayob & Shukri, 2020). Based on a study by Zakaria and colleagues (2021), undergraduate students at a public university in Kelantan, Malaysia consume very little FV, and 63.6% seldom ever eat fruits, which should be consumed for two servings per day. They also mentioned that almost half preferred cheaper, fried, and instant foods over healthy, nutrient-dense options for their daily meals. Another study demonstrated that none of the participants had a healthy diet,

and only a small percentage of them included enough fresh produce, such as FV, in their daily meals (Lee *et al.*, 2023).

Additionally, a study conducted among health science students at the Universiti Teknologi Mara (UiTM) Selangor, a public university, showed similar results. The study included students from the Faculty of Health Science, including those enrolled in the Dietetic program, with the expectation that they would know more about nutrition than non-health sciences students. Nonetheless, the results indicate that UiTM Selangor's health sciences students consume significantly fewer FV than the WHO's recommended five servings per day (Ikram & Rohadi, 2019). The findings indicate that 81.6% of students do not meet the fruit requirement of at least two servings per day, and 54.1% do not meet the vegetable requirement of at least three servings per day (Ikram & Rohadi, 2019). These findings prove that Malaysian university students also have inadequate daily intake of FV.

2.2 Individual factors

2.2.1 Food preferences

Food preferences are extremely complex, unique, and impacted by many different elements, particularly physiological ones. While everyone knows that health is essential, when people are making food choices, they typically value taste and enjoyment over health. This is no different in university students who are transitioning to be independent adults. In a survey conducted among students at a public university in Bangladesh, the participants acknowledged that they typically took food texture, colour, and smell into consideration when making meal choices. Furthermore, food taste was found to be a prevalent component in decisions about food intake in a related study (Kabir, Miah &

Islam, 2018). Even though the participants frequently brought up these topics, it was discovered that the tendency to make decisions based on familiarity and experiences—which are frequently connected to geographic backgrounds—varied and information is scarce, especially in our Malaysian setting. As an example, some of them liked spicy food, and others, depending on their tastes, liked sweetness or bitterness. Meal patterns may also be related to taste and preference, which can vary throughout cultures and individuals, according to Hasma and colleagues (2023).

Similar results were echoed in a qualitative study by Sogari and colleagues (2018), who discovered that university students' tastes have a role in determining what foods they consume. The students made the comment that food that is unhealthy simply tastes better than food that is healthy. Additional research from the same study revealed that another student's confirmation of likeability as the primary determinant of food choice—that is, the perception that unhealthy food just tastes better—was also supported. Another participant emphasized how important it is to enjoy food, which inspired them to pick a daily diet despite its health risks (Sogari et al., 2018). The study findings can be interpreted as having taste trump health to be the main drive on food selection in university students.

A recent study conducted among Kuwaiti university students on fruit and vegetable intake revealed similar findings related to earlier research that found taste also influences fruit and vegetable consumption (Alkazemi & Salmean, 2021). Even if certain FV options were available, the students acknowledged that taste was a factor and that they would be more drawn to other options than choosing FV to be part of their meal (Alkazemi & Salmean, 2021). Additionally, a different study's findings suggest that

consuming less of these vegetables are associated with a greater sensitivity to bitter flavours (Nagai *et al.*, 2017). This finding highlights the importance of taste preference as a major determinant of students' vegetable avoidance. Consequently, students could decide not to include these vegetables in their own dishes (Kaewpradup *et al.*, 2024).

Nonetheless, another aspect of food preferences that affects adults' diet intake is revealed by a study on factors linked to FV intake from Lagos State, Nigeria. They discovered that food texture affects adults' preferences for specific kinds of food (Olatona *et al.*, 2018). These results suggested that, in a manner comparable to daily FV intake, food choices are a significant determinant of dietary eating behaviours.

2.2.2 Past food habits

Students' eating patterns and food selections on campus may also be influenced by their prior nutritional habits. Students appeared to be more likely to think about the flavour, colour, and ingredients of food that they have grown accustomed to eating with their families (Kabir, Miah & Islam, 2018). In the end, children who were inclined or disinclined to choose specific food kinds were influenced by family feeding practices (Kabir, Miah & Islam, 2018). Given that parents create the home eating environment, shape a child's perspective on food, and help them develop their own food choices and eating habits, it appears that parental dietary patterns have the greatest impact on children (Scaglioni *et al.*, 2018). Moreover, research suggests that children's eating patterns are likely to persist throughout adulthood (Mahmood *et al.*, 2021). The study emphasizes the significance of forming good eating habits prior to adolescence because poor dietary practices developed during adolescence were likely to track throughout early adulthood (Appannah *et al.*, 2021).

Early-life preferences for FV are associated with healthy eating practices as an adult (Albani *et al.*, 2018). According to Alkazemi & Salmean (2021), prior studies showed that whether or not a person developed a habit of consuming a lot of FV as a child was one of the most significant factors in influencing their consumption of FV. As a result, parental behaviours play a significant role in shaping the habits of food consumption. Proper parenting techniques were linked to increased FV consumption. This is due to the fact that early childhood exposure to FV has been linked to a greater acceptance of these foods as an adult (Mahmood *et al.*, 2021).

The findings of these research demonstrated the significance of parental modelling for children's diets in terms of eating habits and food selections. Since parents choose the family's food and set the example for eating, children's dietary habits rapidly change throughout the first year of life. Children therefore frequently mimic the actions and eating habits of their parents (Mahmood *et al.*, 2021). Additionally, the importance of early food education and family eating habits cannot be overstated, as participants who are raised in a home that values healthful eating tend to make better food choices in university (Sogari *et al.*, 2018; Amore, Buchthal & Banna, 2019). According to Wongprawmas and colleagues (2022) these results also suggest that individuals who were raised with unhealthy family customs or practices are reluctant to alter them even though they are aware of their harmful nature. It is crucial to instil good eating habits in children because research has shown that consuming less FV starts early in childhood and adolescence will decrease in adult consumption (Alkazemi & Salmean, 2021).

2.3 University setting and dietary intake

2.3.1 Academic activities

Other than cost and health-related considerations, students ranked having a busy lifestyle as one of the top three priorities when it comes to food choices. According to Wongprawmas and colleagues (2022), university students' personal time constraints are one of the obstacles preventing them from consuming a balanced diet. The findings are consistent with recent research that found, aside from budgets and unhealthy food intake, that one of the most significant adjustments that young adults have when they attend university is time limits (Sogari *et al.*, 2018; Hilger-Kolb & Diehl, 2019).

Two important modifications that apply to all participants are time constraints and an imbalanced or unvaried diet. Time restrictions have been identified as a barrier to healthy eating in numerous research (Sogari *et al.*, 2018). The participants emphasized that they did not have time to prepare meals or eat healthily due to their busy schedules. University students value studying and being accepted by their peers over other things, such as eating healthily, and they tend to devote more time and resources to these difficulties (Amore, Buchthal & Banna, 2019). Because of this, individuals frequently eat quick, ready-to-eat meals that may be low in nutrients and high in calories (Wongprawmas *et al.*, 2022).

According to a study, participants' hectic academic schedules frequently caused them to miss breakfast and lunch. They claimed that academic timetables had a detrimental effect on leading a healthy lifestyle. Yet, participants in the study connected regular FV consumption to healthy living. Due to their hectic academic schedules, the majority of study participants consumed FV only occasionally and irregularly,

particularly when they were in school as opposed to at home (Menakaya & Menakaya, 2022).

Additionally, a study conducted by Vilaro et al. (2018), discovered that the main cause of their low consumption of FV is their hectic lifestyle, which is mostly brought on by the time commitments involved in attending classes and completing academic work. They discovered that when students' dietary decisions were influenced by their hectic daily schedules, they ate more added sugar, sugar-sweetened beverages (SSB), and fewer FV (Vilaro *et al.*, 2018). This suggests that students' capacity to eat healthily may be adversely affected by their personal preferences and the university lifestyle. Thus, it can be concluded that a busy lifestyle that results in a lack of time is one of the key factors influencing students' daily intake of FV as well as their healthy eating habits (Wongprawmas *et al.*, 2022).

2.4 Societal factors

2.4.1 Influence of peers

Prior research examining the factors influencing eating habits among this demographic discovered that models, support, and social norms boosted the desire to make healthful decisions. Adolescents' eating and drinking habits may change because of social influence. Previous studies have demonstrated that peers and the social settings have a far greater impact on adolescent development than they do on actions at later stages of adulthood. To avoid being judged by others, adolescents emulate the behaviour of others, seek out social acceptability, and adhere to social norms (Perkins, Perkins & Craig, 2018). Decades of study has demonstrated that people conform to social norms, and in particular, perceived peer norms—that is, an individual's perceptions about what most

peers do—may be a significant impact in influencing what teenagers choose to eat and drink (Perkins, Perkins & Craig, 2018).

Furthermore, focus group discussions revealed that university students were most influenced socially by their partners and flatmates (Deliens *et al.*, 2018). According to a qualitative study, participants' choices about what to eat were regularly influenced by their roommates, classmates, close friends, and hall residents (Kabir, Miah & Islam, 2018). The results of other qualitative studies that employ an ecological approach—which considers the relationships and ongoing interactions between individuals and their environments—also match these findings, showing that university and university students' eating habits are influenced by social environments, including social support and role modelling from friends and family. The current study's results also show a favourable relationship between modelling and food consumption, with higher FV intake by students themselves being correlated with higher FV consumption by friends and peers other than partners and parents (Deliens *et al.*, 2018).

Many of people's behaviours, including their consumption of FV, are probably influenced by how others behave. Epidemiological data indicates a positive correlation between an individual's eating habits and their opinions on what other people eat. Studies on interventions have also shown that dietary behaviours can be influenced by certain stimuli. Peer modelling, in which a selected individual exemplifies the desired behaviour, and social norms messaging, which describes the typical behaviour of a group of peers, are two ways to do this. Both approaches could be useful in persuading young individuals to change how often they eat nutritious foods like FV (Nix *et al.*, 2018). This result

demonstrated how peer pressure has a significant impact on university students' food intake, which in turn influences their daily intake of FV.

2.5 Environmental factors

2.5.1 Availability of fruits and vegetables

In addition to human physiology, our dietary choices can also be significantly influenced by the physical surroundings. Nutrition can be greatly influenced by the living environment. Eating habits may be influenced by the educational setting in both positive and negative ways. For instance, most students said that their eating habits were greatly impacted by the dining halls. Moving to a university setting can influence one's food sources. One major obstacle to students' poor vegetable consumption is the university canteens' lack of healthy meal alternatives (Hilger-Kolb & Diehl, 2019; Whatnall *et al.*, 2021).

Availability of healthful food is essential for people to adhere to the most recent dietary guidelines. Personal food preferences are influenced by a variety of social and individual characteristics as well as the availability of food options in one's surroundings. According to Ikram & Rohadi (2019) study that was conducted at a public institution in Selangor, 65.8% of the participants reported of having trouble finding accessible and readily available FV. There is a considerable correlation between overall FV intake and availability and accessibility. Lack of availability, variety and low quality of FV in cafés have been demonstrated to be barriers to the intake of this food (Ikram & Rohadi, 2019).

These results have been confirmed by a study conducted among students at a public university in Bangladesh, which found that a significant determinant of diet appeared to be the availability of fresh raw food products at reasonable rates (Kabir, Miah & Islam, 2018). Participants stated that female students prefer to cook in their residence halls when they can afford to buy food, especially seasonal vegetables (winter) at reasonable costs. Wintertime brings with it an abundance of vegetables that are inexpensively available on campus, which affects how people cook them. As a result, wintertime vegetable intake rose. Likewise, during the monsoon, students encountered some challenges with cooking due to the decreased availability and cost of vegetables (Kabir, Miah & Islam, 2018). The study found that students became interested in cooking in the winter and ate enough vegetables because of the availability and low cost of the food. In the winter, vegetables become more readily available and well-liked in the hall canteen and pop-up food stores. Compared to other seasons, students tend to eat greater amounts of vegetables during that time. However, during the rainy season since they do not have enough vegetables at that time, thus, causing reduced their intake (Kabir, Miah & Islam, 2018).

2.5.2 Food price (cost)

One of the most frequent reasons given by students for selecting or deciding on their dietary intake was the cost of food. The biggest obstacle to eating a healthy diet is expense, among other factors that affect diet. Numerous studies have shown that those with low incomes find it difficult to eat healthily due to the comparatively high cost of FV (Alkazemi & Salmean, 2021). This claim is further supported by a different study conducted in North Central Nigeria, which discovered that the two most important factors

influencing adult intake of FV were its cost and seasonal availability (Chapman *et al.*, 2017).

Vegetables and fruits were not prioritized when buying food. It is regarded as an addition or condiment (Ikram & Rohadi, 2019). The increased cost of FV at university salad and fruit bars, they said, causes lower income students to eat fewer of them. Similar findings were made in a different study, which discovered that as majority of public university students were from lower middle-income backgrounds, their families only gave them a small amount of money to get by. According to Kabir, Miah & Islam (2018), as a result, they frequently used cutting costs as a coping mechanism when choosing what to eat.

Moreover, a study by Aceijas and colleagues (2017) found that students' healthy eating habits are becoming more difficult as a result of the expensive food on campus, which is in competition with a range of inexpensive fast-food options off campus. According to study participants, university canteens offer healthy food options like FV, but they are not as varied or as affordable as other meal options, which makes it harder for them to eat enough FV every day (Wongprawmas *et al.*, 2022). According to a study Ikram & Rohadi (2019), even if people have more money available, this has not always translated into an increase in FV consumption. Instead, people sometimes prefer to spend their money on takeout or dining out rather than purchasing more FV.

2.6 Qualitative research

In-depth interviews with a semi-structured approach of the interview guide, utilizing a qualitative approach will be employed to examine the reasons behind the participants' inability to meet the recommended daily intake of FV as per the Malaysian Dietary Guidelines, even though they are aware of the low consumption. The goal of qualitative research is to acquire a comprehensive understanding of how individuals perceive their lives as they are being lived. One of the most popular and well-recognized types of qualitative research methodologies is the interview (Mashuri *et al.*, 2022).

In-depth interviews are regarded as conversational activities that go beyond merely retrieving information. Through them, the researcher aims to comprehend the interviewees' world and the meanings they attach to their experiences. This method is regarded as the most direct and research-focused interaction between researcher and participant. It is the main approach utilized in qualitative research since it has been demonstrated to produce highly contextualized accounts of participants' experiences and their interpretations of them. Depending on the researcher's goals, various interview forms are available, such as semi-structured, unstructured, and structured interviews (Mahat-Shamir, Neimeyer & Pitcho-Prelorentzos, 2021). A semi-structured approach of the in-depth interview was selected for this study.

The semi-structured approach in the in-depth interview is classified as an exploratory interview by Todd & Shackelford (2020). They further on to say that a semi-structured approach usually follows a guide and is centered around the primary subject

that offers a broad pattern. Because the semi-structured approach enables researchers to obtain comprehensive data and supporting documentation from respondents while giving careful thought to the study's objectives, they are thought to have greater potential than other forms of interviews (Mashuri *et al.*, 2022). Furthermore, Todd & Shackelford (2020) argue that although semi-structured approaches have topical trajectories given ahead of time, they nevertheless allow a researcher to delve deeply into a discovery. It is predicated on the idea that interviewees are more willing to share their opinions in a context that is reasonably openly created than in a standardised world setting, such as a questionnaire.

The semi-structured approach of the in-depth interview combines set survey questions with open-ended, ad hoc follow-up questions started by the interviewer as a means of gathering data. Based on their initial response, these questions allow the respondent to provide more specific information (Ahlin, 2019). Researchers should be aware of the ongoing conversation during in-depth interviews and provide relevant follow-up questions that expand on more general knowledge, even when the interviews start with a series of questions. The semi-structured approach in the in-depth interview can assist researchers in comprehending the how and why of phenomena by delving deeply into participant-generated topic areas (Ahlin, 2019).

Furthermore, because of its versatility and flexibility, the semi-structured approach was preferred in the qualitative study. The semi-structured approach of the interview guide in the in-depth interview is seen by many qualitative researchers as a

flexible and adaptive method that allows them to ask their interviewees questions while keeping track of their studies. However, because the direction of a semi-structured approach in the in-depth interview is completely controlled, its sense of flexibility and adaptability stands out from the looseness of an unstructured interview (Mashuri *et al.*, 2022). Semi-structured approach as the interview guide in the in-depth interview is both structured and flexible since it incorporates possibilities for more in-depth exploration of subjects that come up during researcher-respondent interactions together with a predetermined set of survey questions that are asked of every respondent (Ahlin, 2019). It also maintains its direction, which is particularly noteworthy in contrast to the unstructured interview approach when the direction is not given due consideration. Given that the primary subjects to be covered have been predetermined, the semi-structured approach in the in-depth interview may therefore allow researchers to modify it in light of their research questions while yet maintaining its directional meaning (Mashuri *et al.*, 2022).

Thus, in this case, an in-depth interview with the semi-structured approach as the interview guide was suitable to be applied as the method of data collection based on this research objectives. By using this method, the objectives of this research which include “understanding” require flexibility to dive into it further as different persons have different circumstances. Furthermore, the aim of this research was not to generalize the results; but rather, to develop a rich understanding of participants’ reasons in determining their eating habits and dietary intake.

2.7 Conceptual Framework

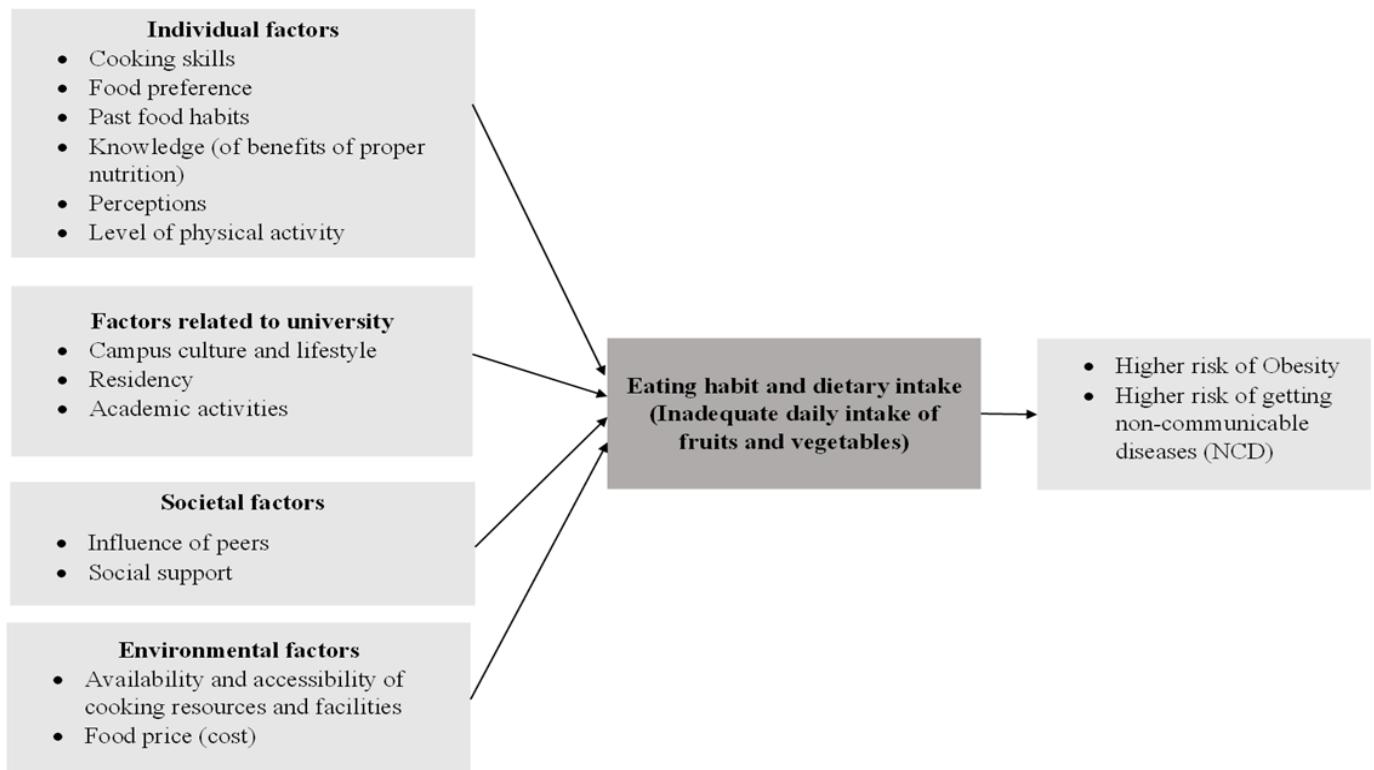


Figure 2.1: Conceptual framework of the study

The conceptual framework shown above will be used to guide by the researcher to understand the reasons behind inadequate daily intake of fruits and vegetables in final year nutrition and dietetics students. This study focused on four main factors—individual, university-related, societal, and environmental—that influence eating habits and dietary intake associated with inadequate daily consumption of fruits and vegetables. FV deficiencies might increase the risk of developing health issues like obesity and other non-communicable diseases (NCD).

CHAPTER 3: MATERIALS AND METHODS OR METHODOLOGY

3.1 Research Design

The research employed a qualitative approach, including in-depth interviews with study participants. According to Ahlin (2019) and Mahat-Shamir, Neimeyer & Pitcho-Prelorentzos (2021), interviews are the main method used in qualitative research and can be used to understand how and why something occurs. In this case, the interview is about the phenomenon of inadequate daily intake of FV in final-year Nutrition and Dietetics students.

Compared to a structured interview, which has a predetermined, limited set of questions, a semi-structured question in the interview guide is more flexible and enables the collection of detailed information and supporting documentation from interview subjects (Mashuri *et al.*, 2022). The semi-structured approach in the in-depth interview starts with a series of questions, and researchers/interviewers will pay attention to what is being discussed and follow up with relevant questions that expand on more information (Ahlin, 2019). Depending on the participant's initial response, more questions may be asked to elicit more specific information. It enables the interviewer to pose additional questions in response to the interviewees' responses (Mashuri *et al.*, 2022). Furthermore, it is expected that interviewees' opinions will be more likely to be communicated in a setting that is reasonably openly designed than in a questionnaire-style discourse that is standardized (Mashuri *et al.*, 2022).