

**THE ASSOCIATION BETWEEN PICKY EATING STATUS,
PHYSICAL ACTIVITY LEVEL, STRESS LEVEL AND BODY
MASS INDEX (BMI) AMONG UNDERGRADUATE STUDENTS AT
UNIVERSITI SAINS MALAYSIA HEALTH CAMPUS**

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UNIVERSITI SAINS MALAYSIA**

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By

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**Dissertation submitted in fulfilment
of the requirements for the degree
of Bachelor of Health Science (Honour) (Dietetics)**

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LIST OF ABBREVIATION

PSS	Perceived Stress Scale
APEQ	Adult Picky Eating Questionnaire
GPAQ	Global Physical Activity Questionnaire
BMI	Body Mass Index
USM	Universiti Sains Malaysia
WHO	World Health Organization
ARFID	Avoidant Restrictive Food Intake Disorder
MET	Metabolic Equivalent of Task
KKM	Kementerian Kesihatan Malaysia
SD	Standard Deviation

**Perkaitan hubungan antara Status Memilih Makan, Tahap Tekanan,
Tahap Aktiviti Fizikal, dan Indeks Jisim Tubuh dalam kalangan
Pelajar Sarjana Muda di Kampus Kesihatan Universiti Sains Malaysia**

ABSTRAK

Amalan memilih makan (*picky eating*), tahap tekanan yang tinggi dan kurangnya aktiviti fizikal sering dikaitkan dengan masalah pengurusan berat badan dalam kalangan pelajar universiti. Fasa transisi kepada kehidupan universiti mendedahkan pelajar kepada perubahan gaya hidup yang boleh mempengaruhi Indeks Jisim Tubuh (IJT) mereka. Kajian keratan rentas ini dijalankan untuk menentukan hubungan antara status memilih makan dengan tahap tekanan, tahap aktiviti fizikal dan IJT dalam kalangan pelajar sarjana muda di Universiti Sains Malaysia (USM). Seramai 154 orang pelajar sarjana muda telah dipilih menggunakan kaedah persampelan mudah melalui pengedaran soal selidik secara digital. Data dikumpul menggunakan instrumen *Adult Picky Eating Questionnaire* (APEQ), *Perceived Stress Scale* (PSS-10), dan *Global Physical Activity Questionnaire* (GPAQ) dan pengukuran antropometri. Kategori IJT berdasarkan garis panduan Kementerian Kesihatan Malaysia. Hasil analisis deskriptif menunjukkan taburan yang hampir seimbang antara pelajar memilih makan (49.7%) dan bukan memilih makan (50.3%). Majoriti besar pelajar mengalami tahap tekanan sederhana (99.3%) dan mempunyai tahap aktiviti fizikal yang rendah (83.7%). Analisis menunjukkan terdapat hubungan statistik yang sangat signifikan antara status memilih makan dengan tahap tekanan ($p < 0.005$) di mana semua pelajar memilih makan (100.0%) berada dalam kumpulan tekanan sederhana. Kesimpulannya, kajian ini membuktikan bahawa amalan memilih makan dalam kalangan dewasa muda mempunyai perkaitan langsung dengan bebanan psikologi dan tekanan akademik, tetapi beroperasi secara bebas daripada rutin aktiviti fizikal dan komposisi berat badan.

The Association Between Picky Eating Status, Stress Level, Physical Activity Level and Body Mass Index (BMI) among undergraduate students at Universiti Sains Malaysia Health Campus

ABSTRACT

Picky eating behavior, elevated stress levels and physical inactivity are increasingly linked to weight management challenges among university students. The transition into university life exposes students to lifestyle changes that can significantly influence their Body Mass Index (BMI). This cross-sectional study aimed to determine the association between picky eating status with stress level, physical activity level and BMI among undergraduate students at Universiti Sains Malaysia (USM). A total of 154 undergraduate students were recruited via convenience sampling using a digitally distributed questionnaire. Data were collected using the Adult Picky Eating Questionnaire (APEQ), Perceived Stress Scale (PSS-10) and Global Physical Activity Questionnaire (GPAQ). and anthropometric measurements. Descriptive analysis revealed a nearly equal distribution between picky eaters (49.7%) and non-picky eaters (50.3%). An overwhelming majority of students experienced moderate stress levels (99.3%) and reported low physical activity levels (83.7%). Analysis demonstrated a highly significant statistical association between picky eating status and perceived stress ($p < 0.005$) categories with 100.0% of identified picky eaters falling exclusively within the moderate stress group. Conversely, no significant associations were found between picky eating status and physical activity levels or BMI classifications.

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CHAPTER 1

1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

Picky eating has increasingly been recognized as a behavior that extends beyond childhood and persists into adolescence and adulthood. Rather than being a temporary developmental pattern, research suggests that picky eating may represent a long-standing eating style characterized by avoidance of unfamiliar foods, heightened sensitivity to sensory qualities of food, and a restricted repertoire of “safe” foods (Zickgraf & Ellis, 2018, Zohar, Shapira, & Lev-Ari, 2025). Because eating is a daily behavior, persistent picky eating has important implications for nutritional quality, mental health, and overall well-being.

Adults who identify as picky eaters often avoid foods based on texture, color, smell, or perceived unpleasant taste and maintain a narrow list of foods they are comfortable consuming. These restrictive patterns can limit dietary diversity, which is a key indicator of diet quality. Evidence shows that adult picky eaters tend to consume fewer fruits, vegetables, whole grains, and lean protein sources compared with non-picky eaters (Kauer, Pelchat, Rozin and Zickgraf, 2015). Reduced intake of these foods may result in insufficient consumption of essential micronutrients such as dietary fibre, iron, calcium, and essential fatty acids. Over time, these nutrient gaps may negatively affect immune function, metabolic health, and the prevention of chronic diseases.

Among university students, picky eating may be further complicated by lifestyle pressures. Students commonly experience irregular meal schedules, limited cooking facilities, financial constraints, and easy access to low-cost convenience foods (Michels

et al., 2020). These conditions may reinforce reliance on familiar, energy-dense foods while decreasing opportunities to consume nutrient-dense and varied meals. As a result, students who are already selective eaters may be at heightened risk for suboptimal dietary patterns and poor nutritional status (Michels *et al.*, 2020).

In addition to nutritional aspects, picky eating appears to be related to broader lifestyle and psychological variables. Physical activity is one such factor. More physically active individuals tend to report greater health awareness and willingness to engage in health-promoting behaviors, including trying different foods and adopting varied diets.

Conversely, lower levels of physical activity have been associated with more limited and repetitive eating habits, where individuals prefer predictable “safe foods” and show less openness to new food experiences (Mikolajczyk *et al.*, 2010). This suggests that lifestyle behaviors may interact with eating patterns in meaningful ways.

Psychological stress represents another important influence on eating behavior. Stress can modify appetite, food preferences, and decision-making around meals. During periods of emotional strain, individuals are more likely to choose highly palatable, familiar, and energy-dense foods while avoiding foods that require effort, preparation, or unfamiliar taste exploration (Michels *et al.*, 2020). Within the university environment, students often manage academic demands, examinations, social expectations, and transitions toward independence. These pressures may amplify selective eating tendencies, making picky eating more persistent during the university years.

The relationship between picky eating and body weight status, often measured using Body Mass Index (BMI), remains inconclusive. Some studies have reported that picky eaters may have lower BMI because of reduced total food intake and limited

appetite. However, other research suggests that when picky eating leads to frequent consumption of calorie-dense but nutrient-poor foods, it may contribute to increased BMI (Ellis and Zickgraf, 2018). These inconsistent findings indicate that the impact of picky eating on body weight likely depends on the types of preferred foods, portion sizes, and accompanying lifestyle behaviors such as physical activity and stress management.

Food neo-phobia, defined as reluctance or fear of trying new foods, is closely linked to picky eating and often co-occurs with it. Studies have demonstrated that higher levels of food neo-phobia are associated with poorer dietary quality, lower intake of fruits and vegetables, and in some adult populations, higher BMI (Lahne, Jönsson, and Wändell, 2018). Research also suggests associations between selective eating, anxiety traits, obsessive tendencies, and restricted food variety, particularly among individuals with avoidant/restrictive food intake disorder (ARFID), a clinical condition characterized by extreme avoidance of food without weight-related concerns (Zohar *et al.*, 2025). Despite increasing global interest in picky eating, most available evidence originates from Western contexts and focuses heavily on children or adolescents. Comparatively fewer studies have explored picky eating among adults, and even fewer have examined university students specifically. The transition into adulthood represents a critical developmental stage where individuals form long-term dietary habits, gain autonomy over food choices, and begin establishing lifelong health behaviors. Understanding picky eating within this period is therefore important for identifying potential nutrition-related risks and opportunities for intervention.

In Malaysia, empirical evidence on adult picky eating remains limited. Cultural food practices, diverse ethnic cuisines, religious dietary rules, and variations in food availability may shape eating behaviors in ways that differ substantially from Western

populations. Moreover, Malaysian university students face unique environmental and lifestyle challenges, including hostel living, cafeteria-based food options, budget limitations, and academic expectations. These contextual factors may influence picky eating patterns, physical activity behavior, stress experiences, and ultimately BMI outcomes.

Given the growing recognition of picky eating as a persistent behavior with potential nutritional and psychological consequences, examining its relationship with physical activity, stress level, and BMI among Malaysian university students is timely. A clearer understanding of these relationships may inform targeted health promotion strategies, guide university-based nutrition programs, and contribute to early prevention of diet-related health problems during young adulthood.

1.2 PROBLEM STATEMENT

Although picky eating in adulthood has gained growing academic attention, important gaps remain in understanding how nutritional intake relates to adult picky eating, particularly when lifestyle and psychological factors are considered together. Much of the existing literature has focused on psychological traits, childhood antecedents, or clinical aspects of selective eating, while relatively few studies have examined current dietary intake patterns among adult picky eaters (Ellis and Zickgraf, 2018., Kauer, Pelchat, Rozin, and Zickgraf, 2015). As a result, it remains unclear whether adult picky eaters experience meaningful nutrient inadequacies and which areas of diet quality are most affected, limiting the ability of nutritionists to design appropriate and targeted dietary interventions (Zickgraf and Ellis, 2018)

Evidence also suggests that picky eating may be influenced by broader lifestyle behaviors, including physical activity, stress, and body weight status. However, these relationships are still poorly understood. Some findings indicate that lower physical activity and high levels of stress may reinforce reliance on familiar, limited “safe foods,” potentially reducing dietary variety (Mikolajczyk *et al.*, 2010., Michels *et al.*, 2020). Meanwhile, the relationship between picky eating and body weight status remains inconsistent. Certain studies report lower BMI among picky eaters due to reduced intake, whereas others suggest higher BMI when selective eating is accompanied by frequent consumption of calorie-dense foods (Ellis and Zickgraf, 2018). These contradictory findings indicate that existing evidence is fragmented and may not capture the complexity of interactions between diet, lifestyle, and picky eating.

A further limitation in the literature is that most research has been conducted in Western countries, with minimal attention to Asian or Malaysian populations. Cultural food practices, meal structure, food availability, and social expectations surrounding

eating differ substantially across cultures. Within Malaysia, there is very limited empirical data specifically addressing picky eating among undergraduates, despite the fact that this population experiences academic stress, limited budgets, and cafeteria-based food environments that may influence food choices and dietary variety.

Valid and standardized assessment tools are now available to evaluate adult picky eating, stress, and physical activity, yet they have rarely been applied to Malaysian university populations. Instruments such as the Adult Picky Eating Questionnaire (APEQ), the Perceived Stress Scale (PSS-10), and the Global Physical Activity Questionnaire (GPAQ) provide structured ways to capture these constructs, but their combined use in a single study examining picky eating, nutritional intake, physical activity, stress, and BMI remain scarce.

Despite these concerns, the use of established international instruments still offers clear advantages. Questionnaires such as the APEQ, PSS-10, and GPAQ have demonstrated acceptable reliability and validity across multiple settings and populations, making them useful benchmarks for research (Armstrong and Bull, 2006., Cohen, Kamarck and Mermelstein, 1983., Zickgraf and Ellis, 2018). In addition, many Malaysian university students have moderate to high English proficiency, particularly in health-related courses, which may support adequate comprehension of questionnaire items. Using standardized tools also enables comparison with international findings and helps position Malaysian data within the broader global literature, provided that interpretation remains culturally sensitive (Beaton *et al.*, 2000).

Given these gaps, it is necessary to investigate picky eating within the Malaysian undergraduate context, focusing specifically on its association with nutritional intake, physical activity, stress, and body weight status. Addressing this gap is important because early adulthood is a critical period during which lifelong eating behaviors are

formed. Understanding how these factors interact among university students will provide evidence needed to support more effective nutrition education, campus-based health interventions, and prevention strategies aimed at reducing future diet-related health risks.

1.3 RESEARCH QUESTIONS

1. What is the body mass index status, picky eating status, physical activity level, and stress level among undergraduate students at Universiti Sains Malaysia Health Campus?
2. What is the association between stress level and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus?
3. What is the association between physical activity level and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus?
4. What is the association between body mass index and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus?
5. What is the association between stress level and physical activity level among undergraduate students at Universiti Sains Malaysia Health Campus?
6. What is the association between stress level and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus?
7. What is the association between physical activity level and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus?

1.4 OBJECTIVES

1.4.1 General Objectives

To determine the association between picky eating status with physical activity level, stress level and body mass index (BMI) among undergraduate students at Universiti Sains Malaysia Health Campus.

1.4.2 Specific Objectives

1. To determine the between body mass index status, picky eating status, physical activity level, and stress level among undergraduate students Universiti Sains Malaysia Health Campus.
2. To identify the association between stress level and picky eating status among undergraduate students Universiti Sains Malaysia Health Campus.
3. To identify the association between physical activity level and picky eating status among undergraduate students Universiti Sains Malaysia Health Campus.
4. To identify the association between body mass index and picky eating status among undergraduate students Universiti Sains Malaysia Health Campus.
5. To determine the association between stress level and physical activity level among undergraduate students Universiti Sains Malaysia Health Campus.
6. To determine the association between stress level and body mass index among undergraduate students Universiti Sains Malaysia Health Campus.
7. To determine the association between physical activity level and body mass index among undergraduate students Universiti Sains Malaysia Health Campus.

1.5 STUDY HYPOTHESES

1.5.1 Relationship between Picky Eating and Stress

Null hypothesis (H_0)

There is no association between picky eating status and stress level among undergraduate students at Universiti Sains Malaysia Health Campus.

Alternative hypothesis (H_A)

There is a significant association between picky eating status and stress level among undergraduate students at Universiti Sains Malaysia Health Campus.

1.5.2 Relationship between Physical Activity and Picky Eating

Null hypothesis (H_0)

There is no association between physical activity level and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus.

Alternative hypothesis (H_A)

There is significant association between physical activity level and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus.

1.5.3 Relationship between Body Mass Index and Picky Eating

Null hypothesis (H_0)

There is no association between body mass index and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus.

Alternative hypothesis (H_A)

There is a significant association between body mass index and picky eating status among undergraduate students at Universiti Sains Malaysia Health Campus.

1.5.4 Relationship between Stress and Physical Activity

Null hypothesis (H0)

There is no association between stress level and physical activity level among undergraduate students at Universiti Sains Malaysia Health Campus.

Alternative hypothesis (HA)

There is a significant association between stress level and physical activity level among undergraduate students at Universiti Sains Malaysia Health Campus.

1.5.5 Relationship between Stress and Body Mass Index

Null hypothesis (H0)

There is no association between stress level and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus.

Alternative hypothesis (HA)

There is a significant association between stress level and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus.

1.5.6 Relationship between Physical Activity and Body Mass Index

Null hypothesis (H0)

There is no association between physical activity level and body mass

index among undergraduate students at Universiti Sains Malaysia Health Campus.

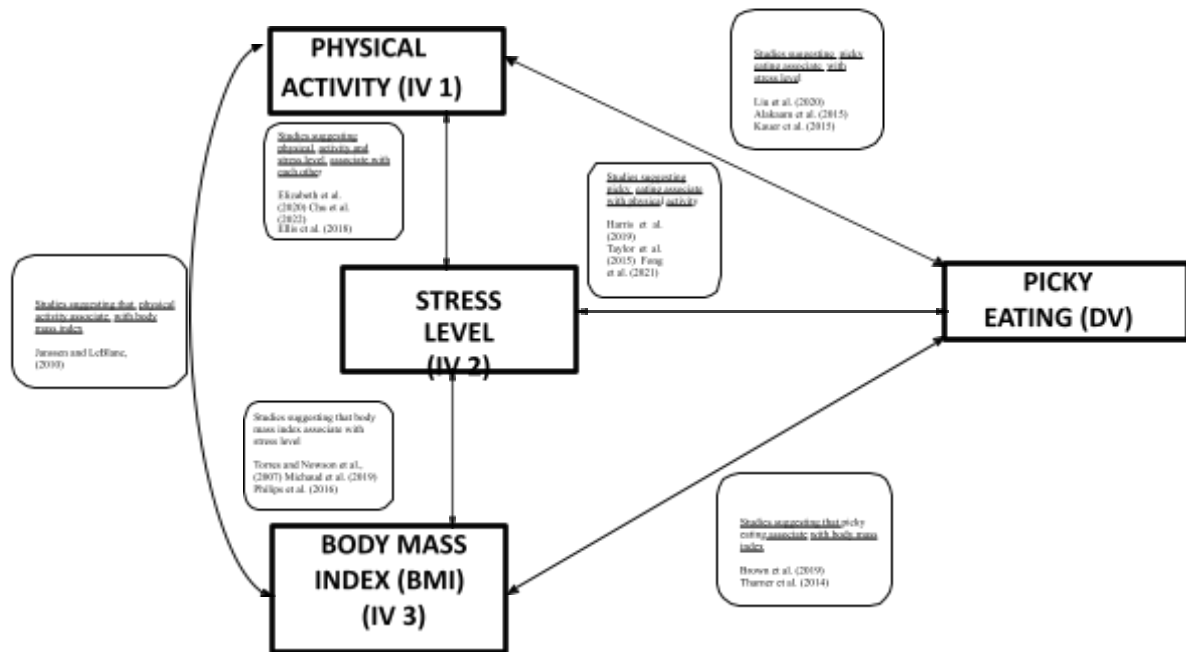
Alternative hypothesis (HA)

There is a significant association between physical activity level and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus.

1.6 SIGNIFICANCE OF STUDY

This study holds significant value in addressing the gap in knowledge regarding the association between picky eating with physical activity, stress level and body mass index among undergraduate students, particularly within a health-focused academic environment, such as the USM Health Campus. By identifying the level of picky eating status and its associated lifestyle and dietary factors, the findings will provide critical insights for university health services, educators, and policymakers to develop targeted interventions aimed at improving students' eating patterns. Moreover, understanding the physical activity levels and stress levels of undergraduate students at USM Health Campus will help in designing effective health promotion strategies that encourage healthier eating habits and increase physical activity, which are essential for preventing eating disorders. Early identification of at-risk students may reflect on their own eating patterns, stress and physical activity, which can motivate positive behavior change even without formal intervention.

1.7 CONCEPTUAL FRAMEWORK



The conceptual framework of this study illustrates that picky eating behavior among undergraduate students could have a relationship with physical activity level, stress level, and body mass index. A two-way arrow is used to indicate reciprocal association. In this study, physical activity (IV1), stress level (IV2), and body mass index (IV3) are designated as the independent variables, while picky eating is designated as the dependent variable. In the literature, evidence suggests that the influence between these variables may operate in both directions. Therefore, the framework uses two-way arrows to reflect the possibility of reciprocal relationships based on prior findings, while still analyzing the variables in this study according to the designated independent and dependent structure. These designations are used to organize the analysis and to examine how each factor is associated with picky eating among undergraduate students.

Stress plays an important role in shaping eating behavior. Research shows that students experiencing high levels of stress are more likely to avoid certain foods, skip

meals, or rely on familiar and comforting options, leading to greater tendencies for picky eating (Liu *et al.*, 2020., Alakaam *et al.*, 2015). At the same time, picky eating itself may increase psychological strain, as individuals with highly selective food preferences often feel anxious in social eating situations or when unfamiliar foods are presented (Ellis *et al.*, 2018., Kauer *et al.*, 2015). Stress is also closely linked to physical activity, where high stress levels reduce motivation and energy to exercise (Li *et al.*, 2019., Byrd-Bredbenner *et al.*, 2021), while regular physical activity has been shown to buffer stress and improve psychological well-being (Elizabeth *et al.*, 2020., Chu *et al.*, 2022). These findings suggest a bidirectional relationship in which stress and physical activity influence each other in ways that may ultimately impact eating behavior.

Physical activity is also an important determinant of picky eating. Students who are physically active tend to have better appetite regulation and more consistent meal patterns, which help reduce selective eating tendencies (Cummings *et al.*, 2020., Fong *et al.*, 2021). Conversely, picky eaters who consume limited food types may have lower total energy intake, reduced stamina, and poorer physical performance, which can discourage participation in physical activity (Harris *et al.*, 2019., Taylor *et al.*, 2015). Thus, physical activity and picky eating may reinforce each other over time, either promoting healthier behavior or contributing to restriction and inactivity.

Body mass index further adds to this relationship. Stress has been shown to influence weight outcomes through hormonal changes, emotional eating, and altered metabolism, often leading to increases in BMI (Torres and Nowson, 2007., Michaud *et al.*, 2019). In turn, students with higher BMI may experience body dissatisfaction or social pressures that increase psychological stress (Phillips *et al.*, 2016., Wang *et al.*, 2020). Physical activity is also strongly associated with weight status, where insufficient activity increases the likelihood of overweight or obesity, while active individuals tend

to maintain healthier BMI levels (Janssen and LeBlanc, 2010., Pengpid and Peltzer, 2020). Higher body weight may also discourage physical activity due to discomfort or reduced mobility (Deforche *et al.*, 2009., Ng *et al.*, 2022), strengthening the reciprocal influence between these factors.

Picky eating itself is connected to body weight, as highly selective diets can lead to both underweight and overweight outcomes depending on the individual's preferred foods and overall intake (Brown *et al.*, 2019., Tharner *et al.*, 2014). Restrictive food patterns may reduce energy intake, contributing to low BMI, while reliance on calorie-dense “safe foods” may lead to excess body weight (Sandvik *et al.*, 2019., Cardona *et al.*, 2015). Likewise, changes in body weight may shape eating behaviors, as individuals with abnormal BMI may adjust their food choices in ways that reinforce selective eating.

Overall, this conceptual framework highlights the interconnected relationships between stress level, physical activity, and body weight status in shaping picky eating behavior. Understanding these associations provides a meaningful foundation for exploring how behavioral and emotional factors contribute to selective eating patterns in young adults.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter describes relevant literature pertinent to the study. The literature review chapter covers: 2.2 Definition of Picky Eating; 2.3 Picky Eating among students in university; 2.4 Picky Eating and Physical Activity; 2.5 Picky Eating and Stress; 2.6 Picky Eating and Body Mass Index; 2.7 Interrelationship among Picky Eating with Physical Activity, Stress, and Body Mass Index.

2.2 DEFINITION OF PICKY EATING

Picky Eating can be described as a critical determinant of nutritional status, physical health, psychological well-being, and long-term health trajectories. Among different patterns of eating behavior, picky eating is characterized by selective avoidance of certain foods, strong preferences, and reluctance to try new or unfamiliar foods that has traditionally been studied in children. Emerging research, however, indicates that picky eating can persist into adolescence and adulthood, including among university populations (Ellis, Galloway and Zickgraf, 2018., Taylor, Wernimont, Northstone and Emmett, 2016). This persistence is particularly significant because young adulthood represents a life stage of considerable lifestyle and dietary changes, often involving increased autonomy over food choices, irregular schedules, academic stress, and exposure to diverse eating environments (Latomme, Stappen, Debour and Cardon, 2019., Bélanger, Gallant, Morin and Romain, 2016).

University students may thus be at particular risk of sustaining or exacerbating selective eating patterns, which can influence dietary quality, nutrient intake, lifestyle behaviors including physical activity, psychological stress, and ultimately body weight

status. The combination of academic pressure, social adaptation, and dietary autonomy makes the university context unique for understanding the persistence of picky eating and its impact on health outcomes. Investigating the associations among picky eating status, physical activity, stress levels, and body weight among undergraduate students is therefore both timely and relevant. This literature review synthesizes empirical findings on these associations, identifies gaps in existing research particularly in Malaysian or Southeast Asian contexts and provides a conceptual rationale for studying such interactions among undergraduates at Universiti Sains Malaysia (USM) Health Campus.

Picky eating in adulthood is typically characterized by refusal to consume certain types of foods, often fruits, vegetables, meats, or foods with particular textures. It also involves restricted dietary variety, food neophobia described as the unwillingness to try new foods and heightened sensitivity to sensory attributes such as taste, smell, texture, or appearance (Ellis *et al.*, 2018., Dovey, Staples, Gibson and Halford, 2008., Taylor *et al.*, 2016). Adults who self-identify as picky eaters frequently report lower enjoyment of eating and label themselves as “unhealthy eaters,” which reflects the interplay of sensory and psychological factors shaping their eating patterns (Zickgraf and Ellis, 2018., Taylor *et al.*, 2016). Moreover, adult picky eating is often associated with increased disgust sensitivity, obsessive-compulsive tendencies, and depressive symptoms, though not necessarily with clinical levels of eating disorders. These findings suggest that picky eating in adulthood represents a stable pattern of selective eating influenced by multiple behavioral and psychological dimensions (Ellis *et al.*, 2018., Coulthard and Blissett, 2009).

Contrary to the perception that picky eating primarily affects children, empirical evidence demonstrates its substantial prevalence among university students. A cross-sectional study of undergraduates reported that approximately 58.3% exhibited

moderate or extreme picky eating, highlighting the persistence of selective eating patterns into young adulthood (Taylor *et al.*, 2016., Ellis *et al.*, 2018). Furthermore, studies among adult university populations indicate that picky eating behavior correlates with lower diet quality, as measured by the Healthy Eating Index, and reduced intake of essential nutrients (Taylor *et al.*, 2016). Despite these insights, the literature highlights heterogeneity in how picky eating is defined and measured, complicating direct comparisons across studies (Dovey *et al.*, 2008., Taylor *et al.*, 2016).

Picky eating carries several nutritional implications. Adults with picky eating tendencies often consume fewer vegetables and less dietary fiber than non-picky eaters, which may reduce overall diet quality and micronutrient adequacy (Taylor *et al.*, 2016., Nicklaus, 2009). A study of 488 college students found that self-identified picky eaters reported significantly lower intake of fiber and vegetables compared to their non-picky counterparts, potentially contributing to deficiencies in vitamins, minerals, and other essential nutrients (Ellis *et al.*, 2018). In addition, young adults with persistent picky eating behaviors often rely heavily on processed foods and sugar-sweetened beverages, further limiting diet quality and contributing to energy imbalance (Taylor *et al.*, 2016). Beyond nutritional intake, picky eating in adults is associated with psychosocial outcomes, including social anxiety, situational distress, and lower quality of life (Taylor *et al.*, 2016., Ellis *et al.*, 2018., Zickgraf and Ellis, 2018).

2.3 PICKY EATING AMONG UNIVERSITY STUDENTS

Picky eating, while often considered a childhood phenomenon, persists into young adulthood and is notably prevalent among university students. This population is undergoing substantial lifestyle transitions, including increased independence in food selection, exposure to diverse culinary environments, and heightened academic and social pressures, all of which may influence eating behaviors (Taylor, Wernimont, Northstone and Emmett, 2016., Ellis, Galloway and Zickgraf, 2018).

Research indicates that a significant proportion of undergraduates continue to display selective eating patterns, with studies reporting that approximately 40–60% of students identify themselves as picky eaters, exhibiting behaviors such as avoidance of certain food groups, preference for familiar foods, and reluctance to try new items (Ellis *et al.*, 2018., Taylor *et al.*, 2016). These behaviors often manifest in limited dietary variety, lower consumption of fruits, vegetables, and whole grains, and a higher reliance on processed or convenience foods (Taylor *et al.*, 2016).

Several factors contribute to picky eating among university students. Psychological characteristics, such as higher levels of anxiety, behavioral inhibition, or disgust sensitivity, are associated with more selective eating behaviors, while social and environmental influences, including communal dining, peer pressure, and cultural food practices, further shape students' food choices (Coulthard and Blissett, 2009., Zickgraf and Ellis, 2018). Additionally, the persistence of childhood picky eating plays a role; students who exhibited selective eating behaviors in earlier years are more likely to maintain these patterns, leading to continued limitations in dietary diversity and potential nutrient inadequacy.

Picky eating among university students has implications beyond nutrition. Studies have shown that selective eaters may experience increased stress or social discomfort

during shared meals, challenges in adapting to unfamiliar foods, and reduced enjoyment of eating, all of which can affect psychological well-being and academic performance (Ellis *et al.*, 2018., Taylor *et al.*, 2016). Moreover, the interplay of picky eating with other lifestyle behaviors, such as physical activity and meal regularity, may further influence health outcomes, including body weight status (Latomme, Stappen, Debourj and Cardon, 2019., Bélanger, Gallant, Morin and Romain, 2016).

2.4 PICKY EATING AND PHYSICAL ACTIVITY

Diet and physical activity are closely linked components of a healthy lifestyle, and research suggests that individuals with restrictive eating patterns, such as picky eating, may engage in lower levels of physical activity (Latomme *et al.*, 2019., Bélanger *et al.*, 2016). Balanced diets rich in whole foods, by contrast, support energy metabolism, muscle function, endurance, and recovery, all of which facilitate participation in regular physical activity (Brien *et al.*, 2017). In university settings, the demands of academic workload and the limited time available for exercise may compound the effects of poor nutrition, further discouraging active lifestyles.

Furthermore, students with poor-quality diets may also demonstrate sedentary behavior, irregular sleep, and other maladaptive habits (Latomme *et al.*, 2019). Although most research on the clustering of diet and physical activity has focused on adolescents, similar patterns likely exist among university students. In this context, picky eating may co-occur with low physical activity, particularly when academic pressures, limited access to healthy meals, and social stressors are present. Despite the plausibility of these links, empirical studies explicitly examining the association between picky eating and physical activity among university students remain limited, emphasizing the need for focused research in this area (Kauer, Reid, Crooke and Blaszczyński, 2014).

2.5 PICKY EATING AND STRESS LEVEL

University students experience high levels of stress due to academic load, financial pressure, social adaptation, and lifestyle changes (Stallman, 2010., Misra and McKean, 2000., Bewick, Koutsopoulou, Miles, Slaa and Barkham, 2010). Stress can influence eating behavior, both triggering selective eating and being exacerbated by it. Picky eating can serve as a coping mechanism for regaining control in stressful situations, with individuals relying on familiar “safe” foods to reduce anxiety and maintain routine (Taylor *et al.*, 2016., Ellis *et al.*, 2018). Physiologically, stress elevates cortisol levels, which may heighten sensitivity to food textures, flavors, and aromas, further reinforcing selective eating patterns (Stallman, 2010., Misra and McKean, 2000).

Psychological traits associated with picky eating include anxiety, behavioral inhibition, disgust sensitivity, and obsessive-compulsive tendencies, which collectively may exacerbate stress in university environments (Coulthard and Blissett, 2009., Zickgraf and Ellis, 2018). Social pressures in communal dining contexts can further increase stress among picky eaters, leading to meal skipping, reduced dietary intake, and social withdrawal (Taylor *et al.*, 2016., Ellis *et al.*, 2018). These dynamics highlight a bidirectional relationship: stress may exacerbate picky eating, while selective eating patterns themselves can generate stress, particularly in academic and social environments (Kauer *et al.*, 2014., Taylor *et al.*, 2016).