THE ASSOCIATION BETWEEN EATING BEHAVIOUR, PERCEIVED STRESS LEVEL AND NUTRITIONAL STATUS AMONG UNDERGRADUATE STUDENTS AT THE HEALTH CAMPUS, UNIVERSITI SAINS MALAYSIA

By

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CERTIFICATE

This is to certify the dissertation entitled "THE ASSOCIATION BETWEEN EATING BEHAVIOUR, PERCEIVED STRESS LEVEL AND NUTRITIONAL STATUS AMONG UNDERGRADUATE STUDENTS AT THE HEALTH CAMPUS, UNIVERSITI SAINS MALAYSIA" is the bona fide record of research work done by Ms. RAFEEZA BINTI ROSLAN during the period from under my supervision. I have read this dissertation, and, in my opinion, it confirms to acceptable standard scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the Bachelor of Health Sciences (Honours) (Nutrition).

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DECLARATION

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

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ABSTRACT

Introduction: The prevalence of stress among university students is increasing, impacting their eating behaviors and overall nutritional status, including metrics such as Body Mass Index (BMI), Waist-to-Hip Ratio, and body fat percentage. This study aims to explore the relationship between stress and eating behavior, as well as its association with nutritional status among undergraduates at the School of Health Sciences in Universiti Sains Malaysia. **Method**: A total of 156 participants were recruited through a convenience sampling method. They completed questionnaires that included sociodemographic information, anthropometric measurements, items from Cohen's Perceived Stress Scale, and the Three Factor Eating Questionnaire (TFEQ-R21). **Results**: The analysis revealed that over half of the participants reported moderate levels of stress (78.2%). When examining the relationship between stress and various aspects of eating behavior such as cognitive restraint, uncontrolled eating, and emotional eating, and only cognitive restraint demonstrated a weak positive correlation. Most participants had a normal BMI (41.7%) and a majority recorded a normal body fat percentage (58.2%), with 22.1% showing a high body fat percentage. Both female (77.9%) and male (91.2%) participants exhibited low health risks concerning Waist-to-Hip Ratio. Notably, cognitive restraint was significantly associated with body fat percentage (p= 0.014).

Conclusion: The findings from this study can inform future research aimed at developing multi-domain strategies to manage eating behavior and stress among students.

ABSTRAK

Pengenalan: Prevalens tekanan dalam kalangan pelajar universiti semakin meningkat, memberi kesan kepada tingkah laku pemakanan dan status pemakanan keseluruhan mereka, termasuk metrik seperti Indeks Jisim Badan (BMI), Nisbah Pinggang-ke-Pinggul dan peratusan lemak badan. Kajian ini bertujuan untuk meneroka hubungan antara tekanan dan tingkah laku makan, serta kaitannya dengan status pemakanan dalam kalangan mahasiswa di Pusat Pengajian Sains Kesihatan di Universiti Sains Malaysia. **Kaedah:** Seramai 156 peserta telah diambil melalui kaedah persampelan mudah. Mereka melengkapkan soal selidik yang merangkumi maklumat sosiodemografi, pengukuran antropometrik, item daripada Skala Tekanan Yang Diperhatikan Cohen, dan Soal Selidik Tiga Faktor Makan (TFEQ-R21). **Keputusan:** Analisis mendedahkan bahawa lebih separuh daripada peserta melaporkan tahap tekanan sederhana (78.2%). Apabila mengkaji hubungan antara tekanan dan pelbagai aspek tingkah laku makan seperti kekangan kognitif, pemakanan tidak terkawal, dan pemakanan emosi, dan hanya kekangan kognitif menunjukkan korelasi positif yang lemah. Kebanyakan peserta mempunyai BMI normal (41.7%) dan majoriti mencatatkan peratusan lemak badan normal (58.2%), dengan 22.1% menunjukkan peratusan lemak badan yang tinggi. Kedua-dua peserta wanita (77.9%) dan lelaki (91.2%) menunjukkan risiko kesihatan yang rendah berkaitan Nisbah Pinggang-ke-Pinggul. Terutama, kekangan kognitif dikaitkan dengan peratusan lemak badan (p= 0.014). **Kesimpulan:** Dapatan daripada kajian ini boleh memberitahu penyelidikan masa depan yang bertujuan untuk membangunkan strategi

pelbagai domain untuk menguruskan tingkah laku makan dan tekanan dalam kalangan pelajar.

CHAPTER 1: INTRODUCTION

1.1 Background of Study

The prevalence of obesity globally tripled since 1975, reaching a concerning level in 2016 (Kowalkowska & Poínhos, 2021). Middle-income countries faced the dual burden of malnutrition, characterized by both undernutrition and overnutrition, as the rapid rise of non-communicable diseases, including obesity, exacerbated the existing challenges posed by infectious diseases and undernutrition. The increasing rates of childhood and adolescent obesity were associated with a higher risk of non-communicable diseases (NCDs) such as type 2 diabetes and cardiovascular disease. Moreover, childhood obesity often persisted into adulthood, significantly increasing the likelihood of NCD development later in life. Notably, the proliferation of obesity was no longer limited to high-income countries; it affected lower socio-economic groups as well. The fundamental issue underlying overweight and obesity was the disparity between energy intake and expenditure (WHO, 2024). Additionally, a growing body of research indicated a connection between emotional eating and overweight and obesity. Emotional eating correlated with BMI in both men and women. These eating behaviours were not indicative of eating disorders but appeared to be influenced by stress, emotions, and individual attitudes towards eating (Dakanalis et al., 2023). Furthermore, stress and emotional situations influenced eating behavior. Stress was known as the negative mood

that could alter appetite, leading to either eating less or eating more (Dakanalis et al., 2023). A survey revealed that the incidence of stressed students in a Malaysian university was 40%, which was higher than the students from different ethnic backgrounds at the same university, who amounted to just 37%. This suggested that more attention should be paid to the issue of stress levels among university students. The stress that individuals experienced was also one of the variables influencing their eating habits. Academic stress from projects, competitiveness, and academic overload primarily caused stress. In the study, the stressed group consumed a lower energy intake (1579 kcal/day) compared to the non-stressed group (1718 kcal/day). This result contradicted a previous study that suggested stressed individuals tended to choose fatty foods compared to non-stressed individuals (Cheng & Kamil, 2020). This illustrated that the eating behaviour of each individual could be different regardless of their stress levels. In this study, waist-to-hip ratio (WHR) was utilized because it was a quick measure of fat distribution that could help determine a person's general health and risk for weight-related diseases. People who carried extra weight around their midsection as opposed to their hips might have been more susceptible to certain health concerns. Those with an "apple-shaped" body showed a higher risk of certain health conditions compared to "pear-shaped" individuals. WHR could also indicate the risk for cardiovascular diseases, type 2 diabetes, and low fertility, especially for women (Burgess, 2023). Based on commonly used guidelines, a WHR of less than 0.95 in men and less than 0.80 in women signified a lower risk of developing health issues. However, the criteria might have needed adjustments based on factors of race and ethnicity (Pugle, 2023). Waist-to-hip ratio as well as BMI Z-score were positively linked to the fat mass percentage (Christaki et al., 2022). A higher fat mass percentage led to higher cortisol levels, increasing emotional stress. Individuals with a higher body fat percentage showed significantly elevated reactivity for both cortisol and cognition,

including lower accuracy in spatial processing, selective attention, and working memory (Mujica-Parodi et al., 2008). Finally, the combination of "psychological distress" and "autonomic variability" predicted stress-induced phenotypic plasticity. "High psychological distress" was associated with an increased likelihood of developing the "wide-waisted phenotype." The wide-waisted phenotype was characterized by an enlarged waist circumference of more than 90 cm in men or more than 85 cm in women, along with elevated plasma triglyceride content (Kubera et al., 2017).

1.2 Problem Statement

A research study and systematic review were carried out on the relationship between eating behaviour, perceived stress level and Body Mass Index (BMI) by Janagar Manoharan (2024) which stated that there was an association between high perceived stress level with median BMI and there was also an association between uncontrolled eating and emotional eating to perceived stress level. In the previous study, the prevalence of stressed university students indicated that almost 40% were high in stress. The stress changed the food consumption and behaviour of the person towards it (Cheng & Kamil, 2020). This problem of stress and eating behaviour lowered the overall food quality intake; this was because stressed students usually opted for unhealthy foods such as processed foods, meat alternatives, and alcohol, while the consumption of vegetables and fruits decreased. The intake of higher total calories per day or less in a day caused by stress resulted in malnutrition problems among young people (Kubera et al., 2016). Young adults, or individuals aged between 18 and 30, were considered one of the groups most at risk for poor health, with their health status potentially deteriorating over time. This was because, in the transition from adolescence to adulthood, they were more likely to eat fast foods, binge drink, and were less likely to

exercise or get physical checkups. Therefore, this caused the current generation of young adults to lead to a higher prevalence of obesity globally (Stroud et al., 2015). Thus, the undergraduates of Universiti Sains Malaysia, Kubang Kerian, Kelantan (USMKK) could not escape from this problem. Additionally, many stressors could have been faced by the students such as academic stress from projects, competitiveness and academic overload, body dissatisfaction, low self-esteem, weight teasing, and pressure to be thin (Cheng & Kamil,2020). It could be concluded that those with a higher fat mass percentage caused higher cortisol levels and increased emotional stress (Christakoudi et al., 2021). Individuals that had a higher body fat percentage demonstrated significantly elevated reactivity for both cortisol and cognition, including lower accuracy in their tasks of spatial processing, selective attention, and working memory (Mujica-Parodi et al., 2008). To fully comprehend the complex relationship between eating habits and body fat percentage in college students, more research was necessary. Therefore, this study was necessary to determine the relationship between eating habits, the percentage of body fat, and stress levels among USMKK undergraduate students.

1.3 Rationale and Justification of Study

The participants in this study were among students who studied at Universiti Sains Malaysia Kubang Kerian, Kelantan (USMKK), specifically at the School of Health Sciences. They were categorized as young adults in the range of 18-30 years old. As a result, the data from this survey provided information on how common eating practices were among USMKK students. In addition, this study examined the waist-to-hip ratio, Body Mass Index (BMI), body fat percentage, and sociodemographic data for USMKK students. We were able to identify the prevalence of underweight, normal, overweight, and obesity among USMKK

students based on the data gathered. The information obtained from this study could help create effective intervention programs and strengthen existing intervention programs. This study highlighted the alarming rise in eating behavior among students in Malaysia, which could help the students develop better eating habits and learn to eat mindfully. The population in this study, which was made up of university students, was at high risk of developing non-communicable diseases, and it was stated that young adults, in this generation, were the unhealthiest group (Stroud et al., 2015). Considering the likelihood of USMKK students experiencing high levels of perceived stress, this issue could be attributed to several causes, including academic exhaustion, competitiveness, academic curriculum stress, and academic stress from assignments. Stress eventually altered appetite, causing either excessive or insufficient food intake. The students at Universiti Sains Malaysia, Kubang Kerian, Kelantan (USMKK) would eventually graduate with degrees in health science and become skilled practitioners in the healthcare industry, which made this study necessary. They had to set an example for better living. In addition, by disclosing how their stress levels affected their eating habits, they were able to manage their stress levels going forward and avoid reflecting that stress by adopting unhealthy eating patterns. As a result, this study contributed to raising students' awareness and understanding of eating habits and their relationship to body fat percentage and perceived stress levels in USMKK. The information gathered from this study was applied to develop intervention plans that effectively stopped the emergence of several health problems. The study's findings also emphasized how critical it was to acknowledge the relationship that existed between people's perceived levels of stress and the kinds of eating behaviors they engaged in, as well as the mutually beneficial impacts of these variables. This knowledge could educate research participants, allowing them to make informed decisions about their perceived stress levels and current eating habits. This therefore

minimized future health problems. The results of this study provided important information about how university students' eating habits related to their reported stress levels and body fat percentage. This study could be a useful resource for academics and researchers since it aided in the discovery and sharing of current knowledge in this field.

1.4 Research Questions

1. What is the eating behavior of Universiti Sains Malaysia Health Campus undergraduate student?
2. What is the perceived stress level among Universiti Sains Malaysia Health Campus under?
3. What is the nutritional status of Universiti Sains Malaysia Health Campus undergraduate student?
4. Is there any relationship between eating behavior and perceived stress level of Universiti Sains Malaysia Health Campus undergraduate student?
5. Is there any relationship between eating behavior and nutritional status of Universiti Sains Malaysia Health Campus undergraduate student?

1.5 Research Objectives

1.5.1 General Objectives

To investigate the relationship between the perceived stress level and eating behavior on the nutritional status among Universiti Sains Malaysia Health Campus undergraduate student.

1.5.2 Specific Objectives

1. To determine the eating behavior of Universiti Sains Malaysia Health Campus undergraduate student.

2. To determine the perceived stress level among Universiti Sains Malaysia Health Campus undergraduate student.

3. To investigate the nutritional status of Universiti Sains Malaysia Health Campus undergraduate student.

4. To investigate the association between eating behavior and perceived stress level of Universiti Sains Malaysia Health Campus undergraduate student.

5. To investigate the association between eating behavior and nutritional status of Universiti Sains Malaysia Health Campus undergraduate student.

1.6 Research Hypothesis

1.6.1 Null hypothesis

There is no relationship between the perceived stress level and eating behavior on the nutritional status among Universiti Sains Malaysia Health Campus undergraduate students.

1.6.2 Alternative hypothesis

There is a relationship between the perceived stress level and eating behavior on the nutritional status among Universiti Sains Malaysia Health Campus undergraduate students.

1.7 Conceptual framework

Nanti masukkan balik

Figure 1.0 Conceptual Framework showing the Sociodemographic factors, Anthropometric measurements, Types of Eating Behaviour and Factors of Obesity

2.0 LITERATURE REVIEW

2.1 Eating behaviors

The prevalence of obesity among adolescents is increasing rapidly and currently becoming one of the global health burdens. There is plenty of research that has already proven that obesity may cause several adverse effects including hypertension, insulin resistance, and dyslipidemia. To decrease these numbers, it is important to understand the causes of obesity development (Lin et al.,2021).

Every human being needs to eat to survive because energy will give a positive energy balance for living. The feeling of fullness or satiety is the process when a person stops eating because fullness triggers the body's appetite control system. Overeating, one of the unhealthy eating behaviours, happens because of non-resistance palatable food, energy-dense foods and eating quickly until the feeling of fullness, which is one of the factors of obesity (Lin et al., 2021).

There are many factors in how eating behaviour could happen, such as weight stigma, body image, emotional stress, and psychological well-being. A previous study has shown that weight perception among young adults who are overweight and obese is usually caused by disordered eating behaviour. Other than that, adolescents who put a high focus on their weight tend to be overconcerned about people's judgments of their appearance. Therefore, these individuals have a higher risk of getting eating disorders that come from their negative psychological effects and dissatisfaction with their body image. Although the association between eating behaviour and obesity might be sensitive things, it is important to create a better intervention for weight management for this specific group (Lin et al., 2021).

2.1.1 Types of eating behavior

In this study, the Three-Factor eating questionnaire is used as the self-assessment scale for the eating behavior among the PPSK students. It assesses the three cognitive and behavioral factors related to eating. Cognitive restraint (CR) is the conscious restriction of food intake to control body weight or promote weight loss, uncontrolled eating (UE) is the urge to eat more than usual because of loss of intake control, and emotional eating (EE) is an overeating behaviour that is developed from dystrophic mood status (Janagar Manoharan, 2024). In this questionnaire, it is only in 21 versions. This shortened form is more suitable for epidemiological studies and clinical trials because study participants may have other multiple questionnaires to be completed in a limited period.

2.2 Stress among young adults

Mental wellness is a crucial factor influencing life quality and satisfaction. Poor mental health is a complex and widespread psychological issue among university undergraduates in both industrialized and developing countries. Extensive psychological and psychiatric research conducted in many industrialized and developing nations over the past several decades has revealed that university students are more prone to stress, anxiety, and depression (SAD) compared to the general population. It is well-documented that SAD, as a multi-factorial illness, can directly and indirectly impair quality of life and well-being, leading to personal, health, societal, and occupational concerns (Mohammad Mofatteh, 2020).

Untreated mental health issues can cause distress among students and negatively impact their lives and studies, resulting in lower academic integrity, alcohol and substance misuse, as well as less sympathetic behavior, marital instability, lack of self-confidence, and suicidal thoughts (Mohammad Mofatteh, 2020). Despite efforts to increase awareness and manage mental health among university students, the number of those experiencing depression and suicidal thoughts continues to rise. This indicates that the interventions made thus far have not been very effective.

Furthermore, in addition to the increase in the incidence of mental health concerns, a comparison of students and non-college-attending peers has revealed an escalation in the severity of psychological disorders among students. For instance, the suicide rate among adolescents has significantly risen over the past few decades. Neglected mental health leading to suicide is the second leading cause of mortality among American college students (Mohammad Mofatteh, 2020).

2.2.1 Factors of stress

Stress is defined in psychological sciences as a state of tension and mental pressure. Low stress levels can be advantageous, desirable, and even healthful. When stress is constructive, it can enhance biopsychosocial well-being and enable effectiveness. Stress may be caused either external with environmental sources or caused by internal perceptions of the individual which eventually may develop negative emotions and feelings (Shahsavarani et al., 2015).

Students may experience stress for various reasons, including competitiveness, academic pressure, and hectic schedules. It can be quite stressful to juggle personal duties like job, family, and social activities with academic responsibilities. For instance, according to a study by El Ansari et al. (2018), university students' mental health and general well-being suffered from stress brought on by the difficulty of striking a balance between personal and academic obligations. Furthermore, peer pressure to perform academically well, keep a good GPA, and competing with classmates may all lead to stress. According to a prior study, students experienced great stress due to pressure to get good grades, which had a detrimental effect on their motivation and psychological health. In addition, intrapersonal and interpersonal stresses including disagreements with classmates, being verbally or physically abused by teachers, and disputes with staff can also lead to stress. Intrapersonal stressors are the internal conflicts and difficulties people have with themselves. Students frequently have high expectations for themselves and put a lot of pressure on themselves to perform well academically. If they feel that they are not meeting these expectations, this can cause stress and worry and worsen their mental health. There are other explanations as well, such as how

stress and a lack of confidence in one's skills can be worsened by emotions of inadequacy or fear of being discovered as a fraud (Gupta et al., 2015).

And lastly, the stressor's environmental component. physical surroundings, like one's home improper or cramped living arrangements, loud surroundings can all add to students' stress levels and make it harder for them to concentrate, sleep, or study. For instance, students who live in small, poorly ventilated dorms with little privacy may find it difficult to create a relaxing and study space, which can raise stress levels. Apart from that, social isolation—whether brought on by a lack of social support systems or a hard time interacting with peers—can make stress worse and have an adverse impact on mental health. For instance, foreign students who find it difficult to fit in may feel alone in their unfamiliar social and cultural surroundings, which might increase stress and make adjustment more difficult (Rppo, 2014).

2.3 Obesity

The prevalence of obesity is a global issue that has tripled between 1975 and 2016 (Kowalkowska & Poínhos, 2021). A middle-income nation like Malaysia is burdened with double forms of malnutrition: the growing danger of noncommunicable diseases like obesity and overweight, along with the issues of infectious diseases and undernutrition. Obesity in children and adolescents is becoming more common, and this is linked to an increased risk of noncommunicable diseases (NCDs), including type 2 diabetes and cardiovascular disease. Obese children are very likely to be obese adults who are at a high risk of acquiring NCDs as adults. Obesity rates are rising not just in high-income nations but also in lower-income ones these days. It's highly probable that children who are obese will continue to be obese into adulthood, putting them at a heightened risk of developing Non-Communicable Diseases (NCDs) later in life. The significant health implications associated with childhood obesity,

noting that children who are obese are highly likely to continue being obese as adults. This persistence of obesity into adulthood significantly increases their risk of developing Non-Communicable Diseases (NCDs) later in life, such as diabetes, cardiovascular diseases, and certain types of cancer.

The prevalence of obesity is no longer confined to affluent nations; it's now prevalent among lower socio-economic groups as well. A notable shift in the global obesity epidemic. While obesity was traditionally associated with high-income countries, it has now become increasingly prevalent among lower socio-economic groups worldwide. This shift indicates that factors contributing to obesity transcend economic boundaries and can affect individuals across different socio-economic strata. The root cause of the overweight and obesity epidemic often stems from an imbalance between energy intake and energy expenditure. This imbalance often results from factors such as unhealthy dietary habits, sedentary lifestyles, and limited access to nutritious foods. Addressing this imbalance through interventions promoting healthy eating habits, increased physical activity, and improved access to affordable, nutritious foods is crucial in combating the obesity epidemic and reducing the associated risks of NCDs. (World Health Organization: WHO, 2024)

2.3.1 Factors of obesity

Factors of obesity could be whether from eating habits, level of physical activity, socioeconomic and genetics (Churilova & Rodina, 2024). Firstly, eating habits play a significant role in the development of obesity. Factors such as consuming high-calorie, low-nutrient foods such as fast food and sugary snacks, excessive portion sizes, frequent