

The Impact of Nutrition on Cognitive Performance Among Students at UiTM Seremban Campus, Malaysia: A Multiple Linear Regression Approach

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ABSTRACT

University students are particularly susceptible to poor dietary habits due to financial constraints, limited food access, and low nutritional awareness. These factors can negatively affect their cognitive functions; however, there are limited research done to explore this relationship. Therefore, the purpose of this research was to investigate the relationship between dietary patterns, hydration, food security, and nutritional awareness with cognitive function and to determine the most significant predictor. Using convenience sampling, a sample of 365 students from Universiti Teknologi MARA (UiTM) Negeri Sembilan Seremban Campus was selected. A close-ended structured online questionnaire served as the primary method for data collection, and multiple linear regression was used to analyse the collected data. The findings revealed that while hydration did not significantly influence cognitive function, dietary patterns, food security, and nutritional awareness did. Furthermore, the most significant predictor was identified to be nutritional awareness. As a result, raising students' awareness of nutrition is essential to improve their academic performance and cognitive health. Overall, this research may assist in ensuring that the students are raised in an environment that encourages both academic achievement and cognitive development

Keywords: Cognitive Function, Nutritional Awareness, Dietary Pattern, University Students, Multiple Linear Regression

INTRODUCTION

Nutrition is fundamental to both physical health and mental well-being and has been known to contribute significantly to cognitive performance as (Lawrence, 2024). It is defined as the process of consuming and using food for the growth, development, maintenance, and regeneration of the body, including providing sustenance for an energetic and healthy life. Nutrition encompasses several key aspects such as dietary behaviours, hydration, food security, and nutritional awareness. Promoting healthy eating habits, staying hydrated, ensuring access to nutritious food, and providing adequate nutrition education are all crucial for overall well-being and academic success (Dodsworth, 2010).

Cognitive performance refers to the mental processes involved in acquiring knowledge and integrating these processes into the conscious aspects of emotions, influencing mood, and having psychiatric manifestations. Such functions are compromised by poor eating habits and a lack of certain nutrients, particularly in young adults who are more active due to their studies and changes in their lifestyle (Tenzin et al., 2021). Statistics show a concerning pattern, especially among university students who suffer from common nutritional deficiencies because of reliance on fast, pre-packaged meals or skipping meals (Dodsworth, 2010; Gómez-Pinilla, 2008).

In Malaysia, research addressing the relationship between nutrition and cognitive performance among university students remains limited. Recent studies have highlighted alarming patterns of food insecurity and breakfast skipping, with over 20% of students experiencing insufficient access to nutritious food (Syafiq Ramlee et al.,

2019) and more than 60% skipping breakfast regularly (Shi-Hui Cheng & Li Qing Rebecca Yew, 2025). These issues raise significant concerns about students' nutritional status and its implications for academic outcomes.

Given the limited research and lack of data concerning Malaysian students' nutritional status and cognitive function, it emphasized the need for extensive assessments and interventions to be conducted on this group of people. This study specifically focused on how dietary patterns, hydration, food security, and nutritional awareness influence cognitive functions such as visual memory, verbal memory, and executive functioning. The scope was limited to students from UiTM Negeri Sembilan Kampus Seremban, and findings may not be generalizable to other populations. The dietary data in this study were self-reported, which raises issues of recall bias. Furthermore, there is also a problem of separating the cognitive effects of nutrition, as there are several other factors that may affect cognitive performance.

RESULTS AND DISCUSSION

The results of this study revealed significant relationships between several nutritional factors and cognitive performance among UiTM Seremban students. Multiple linear regression analysis demonstrated that dietary patterns, food security, and nutritional awareness were statistically significant predictors of cognitive performance ($p < 0.001$), while hydration was not found to be significant ($p = 0.307$). Among the predictors, nutritional awareness had the strongest influence ($\beta = 0.296$), followed by food security ($\beta = 0.272$) and dietary patterns ($\beta = 0.283$). The overall model accounted for 40% of the variance in cognitive performance ($R^2 = 0.400$), indicating a moderate explanatory power. However, this value is considered common in social science research, where the primary aim of the study is to discover relationships between variables instead of making predictions using the model (Ozili, 2023).

These findings suggest that students who are more nutritionally informed and food secure tend to perform better cognitively, likely due to better food choices and consistent access to nourishing meals. This aligns with previous literature emphasizing the role of dietary quality and nutrition literacy in supporting academic and cognitive functioning. Although hydration did not significantly contribute to the model, this may be due to confounding variables such as caffeine intake or physical activity, which were not controlled in this study (Zhang et al., 2018). Overall, the results underscore the importance of promoting nutritional education and food accessibility to support students' intellectual development.

Table 1: Coefficient Results

Variable	Unstandardised Beta	Standardised Beta	Significance
Constant	1.124	-	<0.001
Dietary Patterns	0.052	0.283	<0.001
Hydration	0.010	0.048	0.307
Food Security	0.062	0.272	<0.001
Nutritional Awareness	0.084	0.296	<0.001

CONCLUSION

This study concludes that nutritional factors, particularly nutritional awareness, food security, and dietary patterns, play a vital role in influencing cognitive performance among university students. Nutritional awareness emerged as the most influential predictor, highlighting the importance of knowledge in making healthier dietary choices that enhance mental function. While hydration was not statistically significant in this model, it remains an important factor requiring more refined measurement in future research. The findings suggest that universities could pilot nutrition education programs, workshops and campus food initiatives on campus. Evaluating the effectiveness of such interventions could provide actionable strategies for policy makers and institutions to see the impact students' cognitive performance and academic outcomes.

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