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E-B Environment - Behaviour Proceedings Journal

AicQoL2025Pangkor

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https://www.amerabra.org/
13th AMER International Conference on Quality of Life,
Puteri Bayu Beach Resort, Pangkor Island, Malaysia.

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Impact of Screen Time on Diet and Physical Activity among Students at UiTM Puncak Alam

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Abstract
This cross-sectional study examines the correlation between screen time, dietary intake, and physical activity among 150 students. Data were collected through a 3-day dietary recall, the International Physical Activity Questionnaire (IPAQ), and a screen-time questionnaire. Most students engaged in moderate to heavy screen time, averaging 850 minutes daily. 68% of participants reported excessive fat intake, and none met the recommended fibre intake of 25–30 grams daily. Regarding physical activity, 38% of participants were classified as moderately active. Correlational analysis revealed a weak but statistically significant positive association between screen time and fat intake.

Keywords: Dietary intake; Physical activity; Screen time; University students

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1.0 Introduction

Screen time has emerged as a critical public-health concern among university students, whose academic, social, and leisure activities increasingly revolve around digital devices. This "digital-native" cohort now spends much of each day on smartphones, laptops, and tablets, a behaviour that while enhancing connectivity and information access has been linked to physical inactivity, sub-optimal eating habits, sleep disturbance, and compromised mental health (Marciano & Camerini, 2021). Many emerging studies have linked excess screen time to the full spectrum of physical inactivity, unhealthy eating behaviours, mental health disturbances, and reduced sleeping time (Wan Ismail et al., 2020). Therefore, excessive screen exposure threatens both the immediate well-being and academic performance of undergraduates.

Dietary habits and physical activity are essential components of a lifestyle that significantly contribute to overall health and well-being. Unhealthy eating patterns, characterised by high consumption of calorie-dense and nutrient-poor foods, are one of the significant causes of obesity, cardiovascular disorders, and other chronic diseases (Stiglic & Viner, 2019). Similarly, physical inactivity, often

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exacerbated by sedentary behaviours like prolonged screen use, is a significant risk factor for non-communicable diseases such as diabetes and musculoskeletal disorders. For university students, these concerns are particularly urgent, as this stage of life marks the transition from adolescence to adulthood. This period is crucial for developing lifestyle habits that can have long-term effects on health.

There is a rising trend of poor lifestyle choices among students in Malaysian universities. This has been exacerbated as students become more sedentary and screen time increases due to urbanisation, academic strain, increased reliance on technology in their studies, or poor emotional coping strategies (Marciano & Camerini, 2021). University students, such as those from Universiti Teknologi MARA (UiTM) Puncak Alam campus in Selangor, encounter challenges stemming from prolonged use of electronic devices like smartphones, laptops, and tablets. Excessive screen use among these students often resulted in poor dietary choices, such as frequent consumption of fast food and sugary snacks, and reduced engagement in physical activities. Nevertheless, there is a lack of studies investigating the impacts of screen time on students' lifestyles.

Addressing this gap, the present study investigates how screen time relates to dietary intake and physical-activity level in UiTM Puncak Alam students. Specifically, the research (i) determines the prevalence of screen-time exposure, nutrient-intake adequacy, and physical activity status, and (ii) examines the correlations between screen time and both dietary and activity behaviours. By providing context-specific, evidence-based insights, the study seeks to guide health-promotion strategies tailored to Malaysian undergraduates, ultimately informing interventions that encourage balanced digital use, healthier eating patterns, and more active lifestyles.

2.0 Literature Review

The global rise in screen exposure among university students has emerged as a pressing public health concern. Young adults, especially those in tertiary education, are increasingly depend on digital platforms for academic, social, and leisure purposes. International surveys indicate that average daily screen time among this group exceeds 7 hours, with some Southeast Asian countries including Malaysia reporting means surpassing 12 hours per day (Stiglic & Viner, 2019). A national survey by Saat et al. (2023) found that over 80% of Malaysian undergraduates exceeded the recommended daily screen time threshold of two hours, while recent post-pandemic assessments have recorded average exposures of up to 13 hours daily, suggesting a deeply entrenched behavioural shift. These findings provide a critical backdrop to the present study, which seeks to explore the lifestyle ramifications of such excessive screen use among undergraduates in Malaysia.

The inverse relationship between screen time and physical activity has also been widely documented. Screen-based behaviours are inherently sedentary and often replace time that could otherwise be spent engaging in moderate- or vigorous-intensity physical activity (Pechtl et al., 2022). In Malaysia, Wan Ismail et al. (2020) reported that each additional hour of smartphone use was associated with a significant reduction in weekly physical activity as measured by the International Physical Activity Questionnaire (IPAQ). More recently, a previous study found that higher screen time was independently associated with lower cardiorespiratory fitness scores, suggesting that digital sedentariness has both behavioural and physiological consequences, even after adjusting for confounding factors like BMI (Vella et al., 2020).

Contemporary models of health behaviour increasingly conceptualise diet, physical activity, and screen time not as isolated domains but as a tightly interconnected triad. Marciano and Camerini (2021) proposed that these behaviours act synergistically to shape an individual's risk profile for chronic diseases, particularly among adolescents and young adults. Longitudinal research indicates that increases in screen exposure often precede declines in dietary quality, which in turn contributes to reduced motivation for physical activity. This cyclical pattern reinforces unhealthy habits and elevates the risk of obesity and metabolic disorders. However, most existing studies in Malaysia have examined these behaviours in isolation, often focusing exclusively on either dietary patterns or physical activity. A holistic, integrative assessment of all three components using validated tools is still lacking.

This study is underpinned by the ecological model of sedentary behaviour, which views screen time as a distal environmental influence that affects individual behaviour through cognitive and environmental pathways. Specifically, it posits that screen time displaces physical activity and alters food preferences through repeated exposure to digital stimuli. By applying this framework, the present study seeks to unpack the associations between screen use and key health behaviours diet and physical activity among Malaysian undergraduates. Importantly, this review highlights several gaps in the current literature. First, there is a lack of integrated studies in Malaysia that simultaneously assess screen time, dietary adequacy, and physical activity using validated and comprehensive instruments. Second, many prior studies rely on food-frequency questionnaires, which do not allow for detailed macronutrient analysis. The use of 3-day dietary recalls, as employed in this study, represents a methodological advancement. Third, given the behavioural shifts induced by the COVID-19 pandemic, there is a pressing need for updated post-pandemic data. Finally, few studies have statistically controlled for confounding variables such as sex and BMI in their analysis, limiting the interpretability of observed associations. Addressing these gaps, this study aims to offer a more complete and contextually relevant understanding of how screen time interacts with lifestyle behaviours among Malaysian university students.

3.0 Methodology

This study employed a quantitative, cross-sectional design to investigate the relationships between screen time, dietary intake, and physical activity among undergraduate students at Universiti Teknologi MARA (UiTM) Puncak Alam. Data collection was conducted

between December 2023 and July 2024, targeting students aged 21 years and above. The research was approved by the UiTM Research Ethics Committee (FERC/FSK/MR/2023/00096), and written informed consent was obtained from all participants prior to data collection.

A power analysis using G*Power 3.1 software determined the minimum sample size required to detect a medium effect size (r = 0.3) with 95% confidence and 80% power. The resulting estimate of 134 participants was increased by 10% to account for potential dropouts, yielding a final target sample of 148 students. In this study, a total of 150 students were successfully recruited using stratified convenience sampling, ensuring diversity across faculties and academic years. The decision to employ stratified convenience sampling was driven by two key factors: the practicalities of conducting the research and the need to ensure that the study population accurately represented the diversity of the larger community. This approach allowed us to effectively balance the logistical constraints of the study while also capturing a wide range of perspectives within the target population.

Participants were included if they were (i) registered full-time students at UiTM Puncak Alam, (ii) aged 21 years or older, (iii) able to communicate in English or Malay, and (iv) willing to participate in anthropometric and behavioural assessments. Students were excluded if they (i) had physical or mental impairments that could hinder participation, (ii) were on medical leave, or (iii) were enrolled in distance-learning programmes.

3.1 Anthropometric measurements

Anthropometric measurements were taken using standardised procedures. Body weight was measured to the nearest 0.1 kg using a digital scale, and height was measured to the nearest 0.1 cm using a portable stadiometer. Body mass index (BMI) was calculated as weight in kilograms divided by height in metres squared (kg/m²). Classification followed the Clinical Practice Guidelines for the Management of Obesity (2nd ed., 2023), which is tailored to the Malaysian adult population (Table 1).

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Table 1. The BMI classification for Malaysian

Classification	BMI (kg/m2)
Underweight	Less than 18.5
Normal	18.5 – 22.9
Overweight	23.0 – 27.4
Obese class I	27.5 – 32.4
Obese class II	32.5 – 37.4
Obese class III	More than 37.5

3.2 Screen time assessment

Screen time was assessed using a validated 18-item questionnaire adopted from Vizcaino et al. (2019), which captured self-reported duration and frequency of screen exposure across five device categories: televisions, TV-connected devices (e.g., gaming consoles), laptops/computers, smartphones, and tablets. Respondents were asked to estimate their average screen time on weekdays and weekends, which was then averaged to produce a total daily exposure score in minutes.

3.3 Dietary intake assessment

Participants' dietary intake was assessed using a 3-day dietary recall, which captured the type and portion sizes of food and beverages consumed during two weekdays and one weekend day. The process of data collection and analysis was adopted from a study by Ab Hamid et al. (2023). Household dishes and measures and food portion size guidelines were used to assist the participants in answering the diet recall by recalling all food consumed in a defined 3-day period. It is a widely used method for collecting dietary data because it is simple, requires less effort from the respondent, and does not call for a high level of literacy in the respondents. Before the 3-day diet recall was conducted, the interviewers were trained to standardise the interview method and to reduce bias.

3.4 Physical activity assessment

Physical activity was measured using the short-form International Physical Activity Questionnaire (IPAQ-SF), a widely used instrument with strong cross-cultural reliability (Lee et al., 2011). The questionnaire captured the frequency and duration of vigorous, moderate, and walking activities, as well as time spent sitting during the past seven days. Total physical activity was calculated in MET-minutes per week, and participants were categorised into low, moderate, or high activity levels based on the IPAQ scoring protocol.

3.5 Data analysis

Data analysis was performed using IBM SPSS Statistics version 27.0. Descriptive statistics were computed for demographic, anthropometric, and behavioural variables. Normality of continuous data was assessed using the Shapiro–Wilk test. Given the non-normal distribution of key variables, non-parametric tests were applied. Associations between screen time, dietary intake, and physical activity were analysed using Spearman's rank correlation. Hierarchical multiple regression was conducted to control for potential confounders, including gender and BMI, in the prediction of dietary and activity outcomes. Statistical significance was set at $p < 0.05$, with 95% confidence intervals reported where relevant.

4.0 Findings

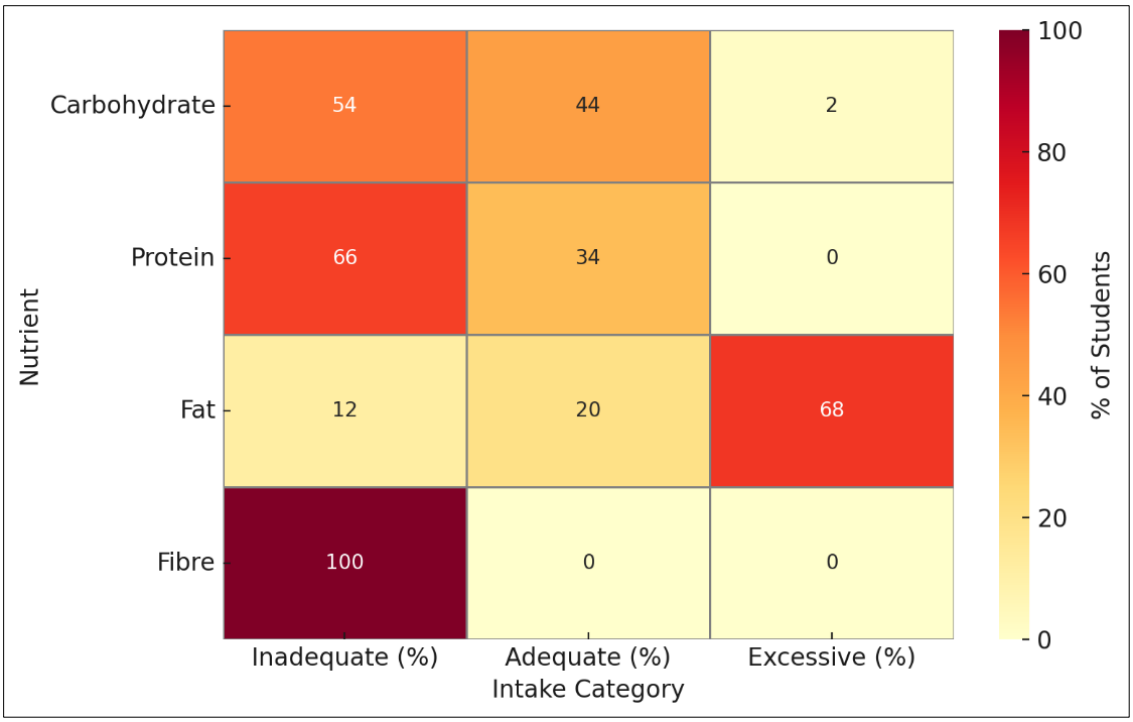
Table 2 shows that more than half of the participants were female (75.3%), while 24.7% were male, and the overall median age of the participants was 22 ± 1.0 years. The screen time category of the participants was that most of them were moderate users (36.7%), followed by heavy users (33.3%), and 30.0% were light users. The mean is 850.4. Most students have a moderate physical activity level (38.0%), 32.7% have low physical activity, and 29.3% have high physical activity.

Table 2. Demographic, anthropometry, screen time and physical activity level among students (n=150)

Variables	Frequency (%)	Mean (SD)
Age (years old)		22.0 (1.2)
Gender		
• Male	37 (24.7)	
• Female	113 (75.3)	
Body Mass Index (kg/m^2)		22.6 (4.6)
• Underweight	24 (16.0)	
• Normal	69 (46.0)	
• Overweight	38 (25.3)	
• Obese	19 (12.7)	
Screen time (minutes)		850.4 (357.5)
• Light users	45 (30.0)	
• Moderate users	55 (36.7)	
• Heavy users	50 (33.3)	
Physical activity level		-
• High	44 (29.3)	
• Moderate	57 (38.0)	
• Low	49 (32.7)	

For macronutrients, 54.0% reported consuming low carbohydrate intake, followed by 44.0% taking adequate carbohydrate intake, and 2.0% consuming excessive intake of carbohydrates. More than half of the participants (66.0%) take a low intake of protein (<1.0g/kg/day), and 34.0% consume an adequate protein intake (≥1.0 g/kg/day). Next, for fat, most participants consumed an excessive fat intake (68.0%), 20.0% consumed an adequate intake, and 12.0% consumed a low-fat intake. All of the participants have a low intake of fiber, which is significantly lower than the recommended intake.

As shown in Figure 1, there were clear disparities in the distribution of nutrient adequacy among the student population. Fiber intake was critically low, with 100% of participants falling below the recommended daily intake. Fat intake was also highly problematic, with 68% of students exceeding recommended levels. In contrast, carbohydrate intake showed a more balanced distribution, though more than half (54%) still consumed inadequate amounts. Protein intake was insufficient in 66% of the cohort, while 34% achieved adequacy.



Note: The nutrients were compared with the recommended nutrient intake for the Malaysian population

Figure 1. Heatmap of dietary intake among students. (n=150)

As illustrated in Figure 2, screen time demonstrated a statistically significant positive correlation with dietary fat intake (ρ = 0.188, *p* = 0.021), suggesting that higher screen exposure is associated with increased consumption of high-fat foods. While negative correlations were observed between screen time and both fiber intake (ρ = –0.146, *p* = 0.075) and physical activity levels (ρ = –0.146, *p* = 0.075), these associations did not reach statistical significance. No meaningful correlations were found with carbohydrate (ρ = –0.115, *p* = 0.162) or protein intake (ρ = –0.153, *p* = 0.061).

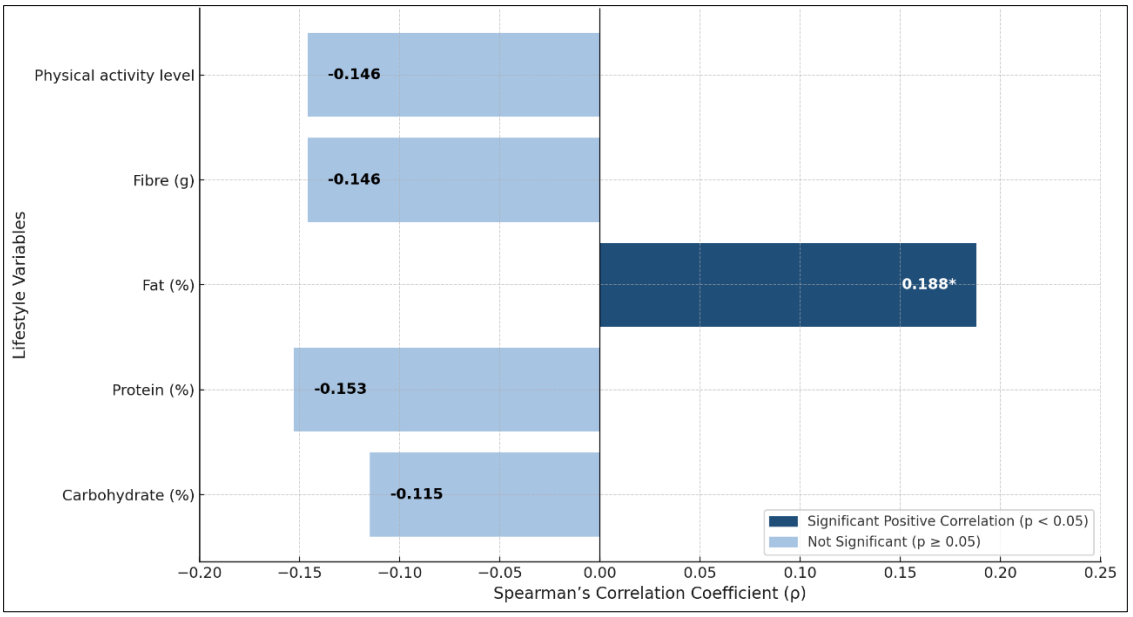


Figure 2. Correlation between screen time, dietary intake, and physical activity among students (n=150)

The P-value was calculated via Spearman's correlation.

5.0 Discussion

This paper highlights the trends concerning screen time, dietary habits, and physical activity among university students, particularly in Malaysia. The findings reveal concerning trends, with over 50% of participants being moderate to heavy screen users. One of the most notable findings is the significant positive correlation between screen time and fat intake. This indicates that higher screen exposure is linked to increased consumption of high-fat foods such as cheeseburgers, chips, and ice cream. This supports prior research suggesting prolonged screen use fosters unhealthy eating patterns, including frequent snacking on energy-dense, low-nutrient foods. The passive nature of screen activities, combined with food advertising, contributes to these dietary behaviours (Athirah Sorfina et al., 2024). Students with high screen time often opt for processed, calorie-rich foods, further exacerbating poor dietary choices.

Another alarming trend is participants' universally low fibre intake, mirroring global patterns in university populations. The present result is supported by a study in Saudi Arabia, which found that more than 75% of university students consumed less than 18 g/day of fibre, a level considered inadequate. This study also noted links between low fibre intake, academic levels, and BMI (Alarifi, 2023). Insufficient fibre consumption is particularly concerning due to its role in preventing chronic diseases such as cardiovascular conditions, type 2 diabetes, and certain cancers. Addressing these deficiencies through targeted dietary interventions is crucial.

The study also highlights an inverse relationship between screen time and physical activity. Nearly one-third of participants reported low activity levels, aligning with existing literature on sedentary behaviours (Rocka et al., 2022). Students spend leisure time sitting and engaging in screen-based activities, which limits their participation in physical activities, subsequently affecting their energy balance. Prolonged sitting during screen time is linked to the consumption of junk foods, which are typically high in calories and low in nutrients. Continuous intake of high-calorie foods can lead to excessive energy consumption and may result in obesity. The World Health Organization (WHO) recommends at least 150 minutes of moderate-intensity aerobic activity weekly; however, many students fail to meet this standard. The sedentary nature of screen use often displaces opportunities for exercise, increasing the risk of obesity, cardiovascular diseases, and metabolic disorders. Academic pressures further compound these challenges, limiting students' ability to engage in regular physical activity.

These findings underscore the interconnected nature of screen time, dietary habits, and physical activity, a behavioural triad with significant implications for health. High screen time correlates with poorer dietary choices, reduced physical activity, and increased stress among young adults (Ge et al., 2020; Rocka et al., 2022). This combination of high screen time, poor dietary habits, and reduced physical activity not only heightens the risk of non-communicable diseases but also poses mental health challenges, such as increased stress and anxiety. Importantly, these findings highlight the need for a holistic approach to health promotion. Interventions should address the interconnected nature of these behaviours rather than treating them in isolation.

While this study provides valuable insights, it has limitations. The use of self-reported data for dietary intake and physical activity introduces the potential for bias. Participants may underreport or overreport their behaviours, affecting the accuracy of the results. Utilising objective measures such as accelerometers for physical activity and 24-hour dietary recall apps could enhance data reliability. Next, the study primarily focuses on Malaysian university students at UiTM Puncak Alam, which may limit the generalizability of the findings. Broader studies encompassing diverse student populations could enhance understanding of screen time's impacts on dietary habits and physical activity.

6.0 Conclusion and Recommendation

This study offers robust empirical evidence linking excessive screen time to adverse dietary and physical activity behaviours among undergraduate students in a Malaysian public university. The findings reveal that high levels of screen exposure, averaging over 14 hours per day, are significantly associated with elevated fat intake and exhibit negative trends in relation to fibre consumption and physical activity levels. The study also documents widespread nutritional inadequacies, particularly in dietary fibre and protein intake, alongside a high prevalence of physical inactivity. Collectively, these results point to a constellation of lifestyle behaviours that, if left unaddressed, may increase the risk of non-communicable diseases and impair students' long-term health trajectories..

While the study has generated valuable insights, it is important to acknowledge its limitations. The reliance on self-reported measures for screen time, diet, and physical activity may introduce reporting biases. The cross-sectional design also precludes any causal interpretation of the associations observed. Future research should adopt longitudinal or experimental designs to investigate the temporal sequencing of these behaviours and their underlying psychological drivers. Incorporating objective measures such as wearable fitness trackers or ecological momentary assessment tools could further enhance the reliability of data.

In light of the findings, universities and public health authorities are encouraged to implement comprehensive health promotion programmes that address the behavioural triad of screen time, diet, and physical activity. At the institutional level, curriculum-based interventions such as digital wellness modules and nutrition education workshops can equip students with the skills and awareness needed to manage screen-related behaviours. These can be complemented by structural measures including subsidised gym memberships, campus walking trails, and policies promoting active breaks during extended periods of digital learning. Campaigns that integrate behavioural nudges—such as screen-time tracking apps and automated reminders—can further support sustainable

habit formation. Importantly, these interventions should be inclusive, student-centred, and informed by behavioural science to ensure long-term engagement and impact.

Acknowledgement
The authors would like to express their gratitude to Universiti Teknologi MARA (UiTM) and all parties involved in this study.

Paper Contribution to Related Field of Study
This study makes a significant contribution to the field by offering evidence-based insights that will shape health promotion strategies specifically designed for this population. It significantly adds to the growing body of knowledge regarding the implications of digital technology use and its profound impact on lifestyle behaviors in the Malaysian context. Additionally, gaining a clear understanding of the dynamic relationship between screen time, diet, and physical activity among Malaysian university students at UiTM Puncak Alam is critical for accurately assessing their current screen time habits. This vital information will drive the development of targeted interventions and effectively promote healthier lifestyles.

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