

The Association Between Internet Addiction and Physical Activity Level among IIUM Students in Kuantan

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ABSTRACT

Background: Internet addiction (IA) has emerged as a major concern among university students and has been associated with prolonged screen time and physical inactivity—both recognised behavioural risk factors for non-communicable diseases (NCDs). Although several studies have examined the impact of IA among university students, limited research has been conducted on the association between IA and the physical activity (PA) level. This study aimed to analyse the association between IA and PA levels among students at the International Islamic University Malaysia (IIUM), Kuantan Campus, Pahang. **Methods:** This cross-sectional study recruited 113 students using a convenience sampling method. Data were collected through an online questionnaire that included socio-demographic characteristics, patterns of internet use, the Internet Addiction Test (IAT), and the International Physical Activity Questionnaire-Short Form (IPAQ-SF). Descriptive statistics and the Chi-square test were performed. **Results:** The findings revealed that the prevalence of IA among students was 31.9%. A total of 34.5% of students had a low PA level, 47.8% had a moderate level, and only 17.7% had a high PA level. No significant association was found between IA and PA levels ($p = 0.963$). **Conclusion:** Despite the absence of a significant association between IA and PA, the relatively high prevalence of IA and physical inactivity underscores the need for targeted health promotion strategies. Awareness campaigns focusing on responsible internet use, reduction of sedentary behaviour, and promotion of regular PA are recommended to mitigate long-term NCD risk and improve overall health among university students.

Keywords:

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INTRODUCTION

Non-communicable diseases (NCDs) are widely recognised as a major public health concern. Their causes are multifactorial, arising from a combination of underlying determinants, modifiable behavioural risk factors, and non-modifiable risk factors (Manning et al., 2021). Behavioural risk factors for NCDs are commonly observed among young adults, particularly university students, among whom the prevalence of these risk factors is notably high. This trend is largely driven by reduced physical activity (PA), rapid urbanisation, increased screen-based behaviours, and other lifestyle-related factors (Alobaid et al., 2023; Cicekli & Gokce Eskin, 2025; Ouyang et al., 2025).

With regard to the PA level, nearly one-third of adults globally were insufficiently physically active, with a prevalence of 31.3% in 2022 (Strain et al., 2024). In Malaysia, data from the National Health and Morbidity Survey (NHMS) 2019 reported that 25.1% of adults were physically inactive (Lim et al., 2025). Among university students, varying levels of PA have been reported across

different university settings worldwide.

A study conducted in northern India found that 14.5% of 4,586 university students were classified as physically inactive (Verma et al., 2022). In contrast, a study from Tamil Nadu reported that among 454 university students, 346 (76.2%) were physically inactive (Kumar et al., 2021). Similarly, a study conducted in Spain reported that over 80% of 2,216 university students were physically inactive, while a substantial 40.5% were classified as extremely sedentary (Garcia-Lorenzo et al., 2024). Similar variations in physical activity patterns have also been observed among local undergraduate students. A study among 167 students at Universiti Teknologi MARA (UiTM) Perlis reported that only 1% of participants were classified as having low-levels of PA, as the vast majority engaged in high (59%) or moderate (40%) levels of activity (Nurfatehah et al., 2024). Likewise, a study at a public university in Selangor found that 56.7% of the 120 respondents demonstrated a good PA level (Sook et al., 2019).

Although studies from Malaysia generally report higher levels of PA, increased screen-based behaviours driven by

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rapid technological development have emerged as a growing concern that may contribute to physical inactivity among young people. This is largely due to the substantial amount of time spent using the internet for academic purposes and entertainment as a means of stress relief (Samaha & Hawi, 2016). Prolonged and excessive internet use may contribute to the development of internet addiction (IA), which has become a major issue among university students and has been associated with reduced levels of PA. Supporting this concern, a previous study involving Thai and United States university students reported that high levels of smartphone use may act as a barrier to PA (Penglee et al., 2019).

Although several studies have examined the impact of IA among university students, limited research has focused on the association between IA and PA levels, particularly within the Malaysian context. Therefore, this study aimed to analyse the association between IA and PA levels among students at the International Islamic University Malaysia (IIUM), Kuantan Campus, Pahang.

MATERIALS AND METHODS

A cross-sectional study was conducted over a five-month period from June to November 2022. Based on a single population proportion sample size calculation, utilising an expected IA prevalence (P) of 36.9% among Malaysian medical students (Ching et al., 2017) and incorporating a 25% non-response buffer—the minimum target sample size was determined to be 124 participants recruited via convenience sampling. The inclusion criteria comprised all IIUM Kuantan students who had been using the internet regularly during the preceding months and who voluntarily agreed to participate in the study. Students who were unable to engage in PA during the previous month due to injury or health-related conditions were excluded.

Upon receiving institutional ethical approval (ref: IIUM/310/G/13/4/4), an online questionnaire was distributed via Google Forms. Participants provided electronic informed consent after reading the study information sheet and selecting a mandatory agreement checkbox prior to accessing the survey. The questionnaire consisted of four sections: (1) socio-demographic characteristics; (2) features of internet use, including daily duration of internet use, purpose of use, and methods and locations of internet access; (3) the Internet Addiction Test (IAT); and (4) the International Physical Activity Questionnaire–Short Form (IPAQ-SF).

IA was assessed using the IAT, a validated 20-item questionnaire rated on a five-point Likert scale ranging from 0 (not applicable) to 5 (always) (Servidio, 2017). The

total IAT score ranges from 0 to 100, with a score of 43 or higher serving as the optimal cut-off point for classifying individuals with IA (Guan et al., 2012).

The levels of PA were assessed using the IPAQ-SF, which evaluates PA over the previous seven days (Lee et al., 2011). PA was expressed as metabolic equivalent task (MET)-minutes per week, calculated by multiplying activity intensity by duration, using standard MET values of 3.3 for walking, 4.0 for moderate-intensity activity, and 8.0 for vigorous-intensity activity (Fogelholm et al., 2006). Total PA was obtained by summing MET-minutes/week from walking, moderate, and vigorous activities. Participants were subsequently categorised into low, moderate, or high PA levels according to the IPAQ-SF scoring guidelines.

Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 29.0 for Windows. Total IA scores and PA levels were calculated. Descriptive statistics were used to determine the prevalence of internet use, IA, and PA levels among IIUM students. The association between IA and PA level was assessed using the Chi-square test, with statistical significance set at $p < 0.05$.

RESULTS

Of the 122 questionnaires completed by students at IIUM Kuantan, 113 were included in the final analysis, yielding a response rate of 92.62%. The remaining questionnaires were excluded due to incomplete data. The mean age of the respondents was 22.06 ± 2.24 years. Table 1 summarises the demographic characteristics of the respondents.

Table 1: Demographic characteristics of the respondents (n=113)

Demographic	Frequency	Percentage (%)
Gender		
Male	34	30.1
Female	79	69.9
Kulliyah		
Medicine	14	12.4
Dentistry	17	15.0
Pharmacy	4	3.5
Nursing	18	15.9
Science	23	20.4
Allied Health Science	37	32.7
Level of Study		
Undergraduate	106	93.8
Postgraduate	7	6.2
Year of Study		
Year 1	11	9.7
Year 2	24	21.2
Year 3	13	11.5
Year 4	54	47.8

Year 5	4	3.5
Masters	6	5.3
PhD	1	0.9

Table 2 presents the features of internet use. The most common purpose of internet use was social networking (96.5%), followed by streaming audio and video content (92.9%) and educational activities (92.0%). In addition, 55.8% of respondents reported using the internet for online shopping, while 53.1% used it for e-banking services. Online gaming was the least common activity, reported by only 26.5% of respondents.

Table 2: Features of internet use

Features	Frequency	Percentage (%)
Duration spent on using internet per day		
< 2 Hours	1	0.9
2-5 Hours	26	23.0
6-10 Hours	48	42.5
> 10 Hours	38	33.6
Method of internet access		
Wi-Fi	62	54.9
Mobile Data	51	45.1
Location of internet access		
Home	79	69.9
Hostel	32	28.3
Faculty	2	1.8

Among the 113 students, 36 (31.9%) were classified as having IA, defined by an IAT score of ≥ 43 , while 77 (68.1%) were classified as non-addicted users. Table 3 presents the distribution of MET-minutes/week according to the IPAQ-SF. About 34.5% of respondents reported low PA, 47.8% moderate PA, and only 17.7% high PA levels. The Chi-square test indicated no significant association between IA and PA levels among the students ($\chi^2(2, n = 113) = 0.074, p = 0.963$).

Table 3: The distribution of MET-minutes/week

PA	Median	IQR
MET-minutes/week		
Vigorous	120.00	960.00
Moderate	120.00	480.00
Walking	297.00	676.50
Total PA	1049.50	1454.25

DISCUSSION

In this study, most students reported spending between 6 and 10 hours per day using the internet (42.5%), while 33.6% reported spending more than 10 hours daily. These findings are consistent with previous research. Radeef and

Faisal (2019) reported that 47.9% of 257 dental students from the IIUM Kuantan used the internet for 20–40 hours per week, with 29.2% of students classified as pathological internet users and a further 12.5% identified as being at high risk of IA. Similarly, Rosliza et al. (2018) found that 44.7% of 322 students from Universiti Putra Malaysia (UPM) spent 4–10 hours per day online, with 25 respondents (7.8%) categorised as addictive internet users.

The high prevalence of prolonged internet use among university students indicates a substantial risk for the development of IA. Consistent with this, the present study found that 36 students (31.9%) met the criteria for IA. Prolonged screen time may also contribute to increased sedentary behaviour, potentially displacing time that could otherwise be spent on PA and thereby increasing the risk of physical inactivity.

Consistent with these findings, most respondents were categorised as having a moderate PA level (47.8%), followed by 34.5% with a low PA level. These findings are consistent with previous studies conducted among university students. For instance, Goje et al. (2014) at UPM and Sahin and Lok (2018) in Turkey reported that the majority of students were classified as having moderate levels of PA (58.3% and 43.9%, respectively). Similarly, Balaraman et al. (2017), in a study among university students in Negeri Sembilan, Malaysia, reported that 35.9% of students had low levels of PA, which aligns closely with the findings of the present study.

Despite the high prevalence of IA and low-to-moderate PA levels, this study found no significant association between IA and PA levels among the participants. This finding is consistent with the study by Dang et al. (2018), which also reported no correlation between IA and PA. The absence of an association among Malaysian medical and health sciences undergraduates could be attributed to several overriding confounding factors. Firstly, heavy academic workloads and busy class schedules often impose substantial time constraints, directly limiting their opportunities for PA regardless of internet habits (Al-Asousi & El-Sabban, 2016). Secondly, poor sleep quality following a modified lifestyle can deplete their energy levels, further discouraging physical exertion (Saat et al., 2020). Beyond these individual constraints, environmental factors such as limited accessibility of sports facilities can restrict PA across the entire student population (Alkhawaldeh et al. 2024).

However, several previous studies have demonstrated a significant association between IA and PA levels, including

studies conducted in Pakistan (Khan et al., 2017), Turkey (Alaca, 2020; Bener et al., 2019), and Taiwan (Chang & Sun, 2020). The discrepancies between these established findings and the present study may be attributed to several distinct factors beyond differences in sample size and statistical power. Critically, variations in the measurement tools used to assess IA and PA may contribute to inconsistent findings across studies, particularly because different studies employ varying cut-off scores to determine and categorise IA levels.

Several limitations should be considered when interpreting the results of this study. Response bias may have influenced the findings, as data were collected using self-reported questionnaires. Such bias is inherent in many survey-based studies, as respondents may underreport IA or overestimate PA due to social desirability or recall bias. Additionally, participants' responses regarding PA may have been influenced by their prior responses to questions on IA, which could have affected the observed association between IA and PA. To address these limitations and achieve more conclusive data, future research should employ longitudinal study designs to better capture long-term behavioural trends. Furthermore, utilising objective PA measures such as accelerometers or pedometers alongside self-reported tools will be crucial to mitigate subjective reporting bias and resolve the inconsistencies found across existing literature.

CONCLUSION

In conclusion, this study demonstrated a relatively high prevalence of IA among university students at IIUM Kuantan, suggesting that this population may be particularly vulnerable to problematic internet use. Although no significant association was observed between IA and PA levels, the coexistence of high IA prevalence and suboptimal PA remains a public health concern. Both excessive internet use and physical inactivity are recognised behavioural risk factors for NCDs. Therefore, these findings underscore the importance of continued monitoring and the implementation of targeted interventions aimed at promoting healthy internet use, reducing sedentary behaviour, and encouraging active lifestyles among university students to mitigate long-term risks of NCDs.

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