Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010


JOURNAL OF INFORMATION SYSTEM AND TECHNOLOGY MANAGEMENT (JISTM)
www.jistm.com

# PREVALENCE OF INTERNET ADDICTION AND ITS DEMOGRAPHIC DETERMINANTS: A CROSS-SECTIONAL ANALYSIS IN MALAYSIA

Md Zahir Abdul Hamid[1*], Nor Shafrin Ahmad[2], Rahimi Che Aman[3]

[1] School of Educational Studies, Universiti Sains Malaysia, Pulau Pinang, Malaysia
Email: mdzahir@student.usm.my
[2] School of Educational Studies, Universiti Sains Malaysia, Pulau Pinang, Malaysia
Email: sham@usm.my
[3] School of Educational Studies, Universiti Sains Malaysia, Pulau Pinang, Malaysia
Email: rahimi@usm.my
[*] Corresponding Author

**Article Info:**

**Article history:**
Received date: 27.06.2024
Revised date: 17.07.2024
Accepted date: 19.08.2024
Published date: 30.09.2024

**To cite this document:**

Hamid, M. Z. A., Ahmad, N. S., & Aman, R. C. (2024). Prevalence Of Internet Addiction And Its Demographic Determinants: A Cross-Sectional Analysis In Malaysia. *Journal of Information System and Technology Management, 9* (36), 149-162.

**DOI:** 10.35631/JISTM.936010



**Abstract:**

This study examines the prevalence of Internet addiction (IA) and its demographic determinants among adolescents in Kedah, Malaysia, aiming to inform targeted interventions and policies. A cross-sectional survey was conducted with 376 students aged 16-17 from urban and rural districts. The Chen Internet Addiction Scale (CIAS) was used to assess IA levels, and chi-square tests analyzed relationships between IA and demographic factors, including gender, race, family income, weekly Internet usage, smartphone ownership, and home Wi-Fi access. The study found that 26.86% of participants met the criteria for IA, with 14.10% at risk. Significant associations were observed between IA and gender ($\chi^2 = 8.437$, $p = .015$), race ($\chi^2 = 29.951$, $p < .001$), family income ($\chi^2 = 16.484$, $p = .002$), weekly Internet usage ($\chi^2 = 21.496$, $p < .001$), smartphone ownership ($\chi^2 = 8.597$, $p = .014$), and home Wi-Fi access ($\chi^2 = 9.250$, $p = .010$). Female students showed higher addiction rates (28.80%) compared to males (23.31%). Students from lower-income families (<RM1500.00) exhibited higher addiction rates (31.43%) than those from higher-income backgrounds. Interestingly, home Wi-Fi access was associated with lower addiction rates (20.40%) compared to those without (34.29%). No significant differences were found between urban and rural locations or age groups. The findings highlight the complex interplay of socio-economic, cultural, and technological factors influencing adolescents' online behaviors and underscore the need for interventions tailored to address gender, racial, and economic disparities. This study recommends community-based awareness programs, improved digital literacy, and support for vulnerable groups. Future research should focus on longitudinal studies and incorporate objective measures to better understand the development of IA over time.

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

**Keywords:**

Internet Addiction, IA, Adolescent, Demographic, Behavioral Addiction, Internet Overdependency, Malaysia

## Introduction

Internet addiction (IA), also known as problematic Internet use, is a growing global concern, particularly among adolescents and young adults. IA is characterized by an excessive and uncontrolled obsession with internet use, leading to distress and impairments in various areas of life, such as mental health, academics, and social relationships (Young, 2004). Research shows that IA has similar behavioral features to substance addiction, and it shares underlying mechanisms with conditions such as anxiety and depression (Kumar et al., 2024; Sam et al., 2022).

Globally, the prevalence of IA varies widely. For instance, studies indicate a prevalence of 19.1% in Hungary (Kapus et al., 2021), 14.4% in China (Xie et al., 2023), and 14.5% in Tunisia (Daoud et al., 2021). These findings emphasize that IA is a significant public health issue across different regions, particularly affecting younger populations. Adolescents are especially vulnerable due to factors such as peer influence, social isolation, and limited parental supervision (Onukwuli et al., 2023).

In Malaysia, the increasing accessibility of the internet has resulted in similar concerns. A recent national survey revealed that approximately 29% of school-going adolescents in Malaysia experience IA, a figure that mirrors global trends (Taufik et al., 2021). This high prevalence is associated with various risk factors such as inadequate parental supervision, loneliness, depression, anxiety, and stress (Fu et al., 2022).

The consequences of IA on Malaysian adolescents are profound, particularly regarding mental health. IA has been strongly associated with increased rates of depression, anxiety, and stress. Research indicates that 10% of adolescents with IA also report anxiety, while 8.11% experience depression, and 8.75% having stress(Jaafar et al., 2022). Additionally, students with IA often exhibit lower emotional stability, which exacerbates their susceptibility to emotional distress (Trumello et al., 2021). These mental health challenges not only affect the adolescents themselves but also contribute to broader societal issues, as untreated mental health conditions can impact their future productivity and well-being.

The Malaysian experience reflects a global pattern where internet accessibility, especially during the COVID-19 pandemic, has heightened the risk of IA (Jabatan Perangkaan Malaysia, 2022; Zaabah et al., 2022). As online learning and social interactions became more prevalent, adolescents spent more time on the internet, resulting in increased levels of addiction and psychological distress (Khodabakhsh et al., 2021). Given the severe implications of IA on mental health and social development, there is a pressing need for targeted public health interventions in Malaysia, particularly focusing on adolescent populations and their families.

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

## Literature Review

### *Internet Addiction*

Internet addiction (IA), initially characterized by Kimberly Young (1998) as a condition involving excessive and poorly controlled urges to use the internet, remains a pervasive issue today. Young's Internet Addiction Test (IAT) is one of the most widely used tools to assess this behavior, demonstrating that IA manifests similarly to other behavioral addictions, such as gambling. Davis (2001) proposed a cognitive-behavioral model that identified maladaptive cognitions—such as escapism and avoidance—as central factors leading to internet dependency. Meanwhile, Caplan (2010) further expanded on this by emphasizing that individuals with IA tend to use the internet to alleviate stress or anxiety, thus reinforcing the compulsive behavior.

Recent studies have also identified links between IA and psychological distress. For instance, research has shown that internet addiction is significantly associated with depression, anxiety, and social isolation, particularly in adolescents and young adults (Boukadida et al., 2023). Furthermore, the prevalence of IA has risen during the COVID-19 pandemic due to increased screen time for work, learning, and social interaction (Shek et al., 2023) These findings underline the continued relevance of IA in today's digital landscape, necessitating intervention strategies focused on improving emotional regulation and reducing escapism behaviors.

### *Prevalence and Concerns in Malaysia*

The National Health and Morbidity Survey (NHMS) by Institut Kesihatan Umum (2018) highlights the growing concern of internet use and addiction among Malaysian adolescents aged 13 to 17. According to the survey, 6 out of 7 adolescents were active internet users, with the majority accessing the internet via smartphones. Alarmingly, 2 out of 7 adolescents were classified as internet addicts, with the addiction rate increasing with age, reaching 38% among Form 5 students. Internet addiction was more prevalent among males (30%) compared to females (28%), and higher among Chinese adolescents (34%) compared to other ethnic groups. Adolescents in urban areas, particularly in Kuala Lumpur and Putrajaya, exhibited the highest addiction rates. The report also raises concerns about the risks of excessive internet use, including online gaming addiction, exposure to harmful content, cyberbullying, and social isolation. These findings underscore the urgent need for interventions to promote responsible internet use among adolescents to prevent the adverse consequences of addiction.

The prevalence of IA in Malaysia is a growing concern, especially among adolescents and young adults. A 2020 study reported that 56.4% of Malaysian adolescents experience some form of internet addiction, underscoring the gravity of the issue (Ooi et al., 2020). This is significantly higher compared to global averages. For instance, the prevalence of IA among adolescents globally ranges from 1% to 27% depending on the region (Cheng & Li, 2014). A study conducted in a Malaysian university found that 5.4% of university students showed severe internet addiction, while 44.7% had moderate addiction (Arifin et al., 2023). These findings suggest that Malaysia is experiencing a higher rate of internet addiction, which reflects broader regional and global trends.

### *Global Trends and Regional Comparisons*

Globally, IA is influenced by factors such as internet penetration rates, GDP per capita, and environmental quality (Chung et al., 2019; Su et al., 2019) The rise in social media (Mou et al.,

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010
2024) and online gaming (Sánchez-Fernández et al., 2024) has exacerbated the issue. In comparison, Malaysian studies have shown even more alarming trends. For example, one study found that 83.5% of medical students exhibited some level of IA during the COVID-19 pandemic, with moderate IA at 16.2% and severe IA at 2.3% (Ismail et al., 2021). These figures suggest that Malaysia may be facing a more severe crisis compared to other regions, possibly due to the rapid digitization and higher internet access among its youth population.

### *Demographic Determinants of Internet Addiction*

Understanding the demographic determinants of IA is crucial for developing targeted interventions. Research suggests that age, gender, and socioeconomic status are important factors in the prevalence of IA. For instance, males are more susceptible to IA than females, and adolescents and college students are at higher risk (Shen et al., 2020). Malaysian studies reflect similar trends, where males and adolescents in higher grades are more likely to experience IA (Taufik et al., 2021). In addition, socioeconomic status also plays a role, as children from lower-income families may lack adequate parental oversight, which increases their vulnerability to IA (Fu et al., 2022).

### *Gaps and Controversies in Current Research*

While IA is a well-researched topic, there are gaps and controversies in the literature. First, there is a lack of consensus on the exact thresholds for diagnosing IA. Global studies often use different assessment tools, leading to varying prevalence rates. Furthermore, some studies argue that the association between IA and mental health conditions such as depression and anxiety may be bidirectional. For example, while IA can exacerbate mental health issues, pre-existing mental health conditions may also lead to internet addiction (Davis, 2001; Loh et al., 2022). This highlights the complexity of the condition and the need for more longitudinal studies.

### *Implications for Interventions and Policies*

Understanding the demographic factors that influence IA has important implications for interventions and policy development. Malaysian researchers have highlighted the need for targeted interventions focusing on adolescents and students, especially those from lower-income backgrounds and those experiencing mental health issues. Digital literacy programs, parental supervision, and mental health support services could significantly reduce the prevalence of IA. Policymakers should also consider creating more awareness around the potential harms of excessive internet use and promote healthier internet habits among adolescents and young adults (Siti Mariam et al., 2022).

## Methods

### *Study Design Description*

We conducted a cross-sectional study using a stratified random sampling method among Form 4 and Form 5 students from eight secondary schools in Kedah, Malaysia. The stratification was based on the geographical location of the schools, ensuring an equal representation from both urban and rural areas. To achieve this, we divided the pool of secondary schools into two strata: urban and rural. From each stratum, four schools were randomly selected, resulting in four urban and four rural schools being included in the study.

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

Once the schools were selected, the next step was to sample students within each school. The student population from each selected school was stratified by grade level (Form 4 and Form 5). Using the school records for the academic session, we created two separate lists of Form 4 and Form 5 students. Fifty students were randomly selected from these lists in each school, ensuring an equal distribution across grade levels while maintaining a diverse representation of the student population. This yielded a total sample size of 400 students, 200 from urban schools and 200 from rural schools, with an equal split between Form 4 and Form 5 students.

The inclusion criteria for participation in this study were: 1) students aged 16 to 17 years, 2) Malaysian citizens, 3) enrolled in Form 4 or Form 5 during the study period, 4) able to converse in the Malay language, and 5) had access to and experience using the internet. This stratified random sampling method ensured that both urban and rural schools were adequately represented in the study, while the equal distribution of students across schools and grade levels helped minimize sampling bias.

***Methods and Tools for Collecting Data***

The data collection process involved the use of a well-structured, self-administered questionnaire, which was distributed via Google Forms to ensure ease of access and convenience for participants. The questionnaire could be completed using smartphones, tablets, or computers. To improve response rates, the school counselors at each of the selected schools played a key role in organizing the data collection process.

In addition to distributing the Google Forms link, several measures were taken to ensure data quality and a high response rate: 1) scheduled computer lab sessions: the school counselors set specific dates for students to use the school's computer labs to complete the questionnaire. This provided students without personal devices or internet access at home an opportunity to participate, ensuring inclusivity, 2) orientation sessions: prior to data collection, counselors conducted short orientation sessions in which students were briefed on the purpose of the study, how to complete the questionnaire, and the importance of honest participation, and 3) automated monitoring: Google Forms was configured to prevent multiple submissions from the same participant by limiting responses to one per user, ensuring data integrity. Thanks to these efforts, 376 out of the 400 invited students completed the questionnaire, yielding a response rate of 94%. This was largely due to the combination of scheduled computer lab sessions and convenient online access, alongside the active involvement of school counselors.

The survey was categorized into two primary sections: demographic data and Internet usage patterns, followed by standardized tools to evaluate online addiction. The primary instrument utilized to assess Internet addiction was the Chen Internet Addiction Scale (CIAS), which was translated to the Malay language (Ali Sabri Radeef et al., 2018). The validity of this scale for evaluating Internet Addiction (IA) in various groups has been thoroughly established. It consists of 26 items, each of which is scored on a four-point Likert scale that ranges from "strongly disagree" to "strongly agree." The CIAS has been extensively utilized in research on Internet addiction (IA) and has demonstrated robust reliability and validity in the specific context of Malaysia (Radeef & Faisal, 2018, 2019, 2021).

Aside from the CIAS, the survey also encompassed questions about demographic variables such as age, gender, family income, and geography location, along with inquiries about the frequency and intention behind Internet usage. Additional variables assessed encompassed the

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

availability of mobile phones equipped with data plans and residential Wi-Fi, both of which are pivotal factors influencing Internet usage in Malaysia.

### *Statistical Analysis*

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 29. Descriptive statistics were calculated to summarize the demographic features and prevalence of IA, including frequencies and percentage. Statistical methods, namely chi-square tests, were used to analyze the relationships between demographic factors (such as age, gender, geography, and family income) and Internet addiction. The ultimate examination encompassed a comparison between urban and rural areas to investigate the impact of geographic location on Internet addiction rates and patterns among Malaysian adolescents. This study yielded insights into the influence of environmental factors, such as Internet accessibility and social context, on the occurrence of Internet addiction (IA) in various regions of Kedah.

## Result

### *Presentation of Demographic Characteristics of the Sample*

The study surveyed a total of 376 adolescents aged between 16 and 17 years across two districts in Kedah, Malaysia. One district represented an urban environment, while the other was rural, ensuring a diverse sample. Table 1 presents the demographic characteristics of the participants. The mean age of respondents was 16.54 years, with a distribution between males (35.37%) and females (64.63%). Family income levels were categorized as follows: 37.23% of respondents came from families earning less than RM1500 per month, 44.95% had a family income between RM1501 and RM5000, and 17.82% had a family income exceeding RM5001. In terms of Internet access, 84.31% of respondents had their mobile phones with data plans, and 53.46% reported having Wi-Fi access at home. The urban-rural distribution of participants was approximately equal, with 55.59% residing in urban areas and 44.41% in rural settings. The participants were asked about their weekly Internet usage: 31.12% of respondents reported using the Internet for more than 40 hours per week, 47.07% for 20 to 40 hours, and 21.81% for less than 20 hours.

**Table 1: Demographic Determinants Associated with Internet Addiction**

| Demographic Variables | Frequency n (%) | Internet Addiction | | | $X^2$ (df) | *P*-value |
|---|---|---|---|---|---|---|
| | | Normal Usage n (%) | At-Risk Usage n (%) | Addicted n (%) | | |
| Gender | | | | | | |
| Male | 133 (35.37) | 74 (55.64) | 28 (21.05) | 31 (23.31) | 8.437 (2) | .015 |
| Female | 243 (64.63) | 148 (60.91) | 25 (10.29) | 70 (28.80) | | |
| | | | | | | |
| Age | | | | | | |
| 16 | 172 (45.74) | 110 (63.95) | 20 (11.63) | 42 (24.42) | 3.369 (2) | .186 |
| 17 | 204 (54.26) | 112 (54.90) | 33 (16.18) | 59 (28.92) | | |
| | | | | | | |
| Race | | | | | | |
| Malay | 280 (74.46) | 147 (52.50) | 39 (13.93) | 94 (33.57) | 29.951 (8) | <.001 |
| Chinese | 41 (10.90) | 28 (68.30) | 7 (17.07) | 6 (14.63) | | |

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

| | | | | | | |
|---|---|---|---|---|---|---|
| India | 53 (14.10) | 45 (84.91) | 7 (13.21) | 1 (1.88) | | |
| Siamese | 1 (0.27) | 1 (100.00) | 0 (0) | 0 (0) | | |
| Sikh | 1 (0.27) | 1 (100.00) | 0 (0) | 0 (0) | | |
| | | | | | | |
| Family Income | | | | | | |
| <RM1500.00 | 140 (37.23) | 74 (52.86) | 22 (15.71) | 44 (31.43) | 16.484 (4) | .002 |
| RM1501.00 – RM5000.00 | 169 (44.95) | 105 (62.13) | 15 (8.88) | 49 (28.99) | | |
| >RM5001.00 | 67 (17.82) | 43 (64.18) | 16 (23.88) | 8 (11.94) | | |
| | | | | | | |
| Internet Usage (hours per week) | | | | | | |
| <20 hours | 82 (21.81) | 52 (63.41) | 12 (14.63) | 18 (21.96) | 21.496 (4) | <.001 |
| 20 – 40 hour | 177 (47.07) | 119 (67.23) | 24 (13.56) | 34 (19.21) | | |
| >40 hour | 117 (31.12) | 51 43.59) | 17 (14.53) | 49 (41.88) | | |
| | | | | | | |
| Location | | | | | | |
| Urban | 209 (55.59) | 124 (59.33) | 30 (14.35) | 55 (26.32) | .081 (2) | .960 |
| Rural | 167 (44.41) | 98 (58.68) | 23 (13.78) | 46 (27.54) | | |
| | | | | | | |
| Owning a Smartphone with data plan | | | | | | |
| Yes | 317 (84.31) | 177 (55.84) | 48 (15.14) | 92 (29.02) | 8.597 (2) | .014 |
| No | 59 (15.69) | 45 (76.27) | 5 (8.47) | 9 (15.26) | | |
| | | | | | | |
| Home Wi-fi | | | | | | |
| Yes | 201 (53.46) | 130 (64.67) | 30 (14.93) | 41 (20.40) | 9.250 (2) | .010 |
| No | 175 (46.54) | 92 (52.57) | 23 (13.14) | 60 (34.29) | | |

***Prevalence of Internet Addiction in the Studied Population***

The prevalence of Internet addiction (IA) was assessed using the Malay version of the Chen Internet Addiction Scale (CIAS). According to the CIAS scoring criteria, Internet usage was categorized into three groups: normal usage (26–57), at-risk usage (58–63), and Internet addiction (64–104). The findings revealed that 222 (59.04%) of respondents fell within the normal usage range, 53 (14.10%) were at risk of developing IA, and a significant 101 (26.86%) met the criteria for Internet addiction. This indicates that a notable proportion of the surveyed adolescents displayed problematic levels of Internet usage, which is consistent with previous findings in Malaysian studies (Ooi et al., 2020; Taufik et al., 2021).

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

### *Age-Related Differences in Internet Addiction*

The age-related differences in internet addiction between 16 and 17-year-olds show interesting patterns, but the results are not statistically significant (P-value = 0.186). While about 24.42% of 16-year-olds were classified as addicted compared to 28.92% of 17-year-olds, this minimal difference, coupled with the lack of significance, means we cannot conclusively say that age influences addiction levels. This trend can be explained by several factors. As adolescents grow, they experience cognitive and emotional changes that can lead to increased online engagement (Victor et al., 2024). Studies suggest that older teens often have more access to technology and spend more time online unsupervised, which can contribute to higher addiction rates (Yang et al., 2021). The lack of statistical significance may also be due to small sample sizes that mask real differences (Field, 2013). Furthermore, given that 16 and 17-year-olds are close in age, future studies should consider younger adolescents, such as those aged 12 to 13 years, who may exhibit different patterns of internet usage and addiction (Kumar et al., 2023). Even though the results aren't statistically significant, they still highlight important patterns that can inform future research and potential interventions. Understanding these trends can help educators and policymakers develop strategies to address internet addiction among young people effectively.

### *Gender-Specific Prevalence Rates*

There was a notable disparity in Internet addiction between genders, as indicated by a significant $\chi^2$ value of 8.437 and a p-value of .015. The prevalence of addiction was greater among female students (28.80%) in comparison to male students (23.31%). This discovery contradicts several previous studies that commonly suggest that guys are more susceptible to Internet addiction as a result of gaming or engaging in specific online activities. Nevertheless, the elevated prevalence of addiction among females in this study could be attributed to their greater engagement with social media and online communication platforms, since previous research has demonstrated their association with addictive tendencies (Su et al., 2020).

### *Urban vs. Rural Location Influences*

The relationship between geography (urban vs. rural) and Internet addiction was not statistically significant ($\chi^2 = .081$, $p = .960$). The prevalence of addiction was similar among both urban (26.32%) and rural (27.54%) adolescents. In contrast to previous research findings, which indicated that urban students may have greater Internet access and, thus, a larger probability of addiction (Sowndarya & Pattar, 2018). The absence of a notable disparity in this study may be attributed to the extensive accessibility of smartphones and mobile data plans, which serve to close the divide in Internet connectivity between urban and rural regions.

### *Impact of Family Income on Internet Addiction Rates*

The family income was found to be a significant effect ($\chi^2 = 16.484$, $p = .002$). Students from low-income households (earning less than RM1500.00) had a greater prevalence of addiction (31.43%) in comparison to students from middle-income (RM1501.00–RM5000.00) or high-income (>RM5001.00) families. This phenomenon can be ascribed to the restricted availability of offline leisure activities for students from lower-income backgrounds, causing them to depend more heavily on Internet usage for entertainment and social interaction. This discovery aligns with previous studies that have demonstrated a correlation between poorer socio-economic status and the likelihood of developing Internet addiction (Essau, 2022; Gjoneska et al., 2022).

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

***Association of Smartphone Ownership and Home Wi-Fi with Internet Addiction***

There was a substantial correlation between Internet addiction and owning a smartphone with a data plan, as well as having access to home Wi-Fi. Students who owned smartphones had a higher addiction rate (29.02%) compared to those who did not own smartphones (15.26%). This is likely because smartphones allow constant Internet access (Gupta, 2019). In contrast, pupils who had access to Wi-Fi at home exhibited a reduced rate of addiction (20.40%) compared to those who did not have access (34.29%). This implies that students who do not have access to Wi-Fi at home may excessively depend on mobile data, resulting in increased rates of addiction. Regulating and monitoring Internet access via residential Wi-Fi can potentially lead to a more equitable distribution of usage (Pastor et al., 2022).

## Discussion

The results of this study contribute to the existing body of research on internet addiction among teenagers, focusing specifically on demographic characteristics. The strong correlations observed between gender, race, family income, internet usage, smartphone ownership, and home Wi-Fi with internet addiction illustrate the complex interplay of socio-economic, cultural, and technological factors that influence adolescents' online habits.

Interestingly, the findings indicate that female students exhibit higher rates of internet addiction, which contradicts the conventional belief that males are more susceptible. This discrepancy may arise from the evolving patterns of internet utilization, particularly the rise of social media and online communication, which have a profound impact on adolescents' lives, especially female (Montag et al., 2024). Studies have shown that girls tend to engage more with social networking sites, which can lead to increased time online and potential addiction ((Anderson & Jiang, 2018). Future research should further investigate these gender dynamics, considering the changing digital landscape and its effects on different genders.

The variations in internet addiction based on race underscore the need for interventions that are culturally sensitive. The elevated prevalence of addiction among Malay students may stem from specific cultural practices and socio-economic conditions that warrant additional exploration (Ooi et al., 2020). Factors such as community norms regarding technology use and varying levels of parental supervision can significantly impact addiction rates ((Nik Jaafar et al., 2021; Ooi et al., 2020). When developing preventative initiatives, it is crucial for schools and policymakers to consider these cultural disparities to tailor their approaches effectively.

Family income has emerged as a critical determinant, with students from lower-income households being more susceptible to developing internet addiction. Consistent with prior research, socio-economic status can influence internet usage patterns, as lower-income households often rely more heavily on the internet for entertainment and social interaction (Essau, 2022; Gjoneska et al., 2022). Efforts to mitigate internet addiction should prioritize providing alternative offline activities and resources for economically disadvantaged youths, encouraging healthier engagement outside the digital realm.

While internet usage was a reliable indicator of addiction, the significance of smartphones and home Wi-Fi connections highlights the need for effective management of digital access. Students who possess smartphones but lack home Wi-Fi are more vulnerable to addiction (Gupta, 2019; Miloš Stanković et al., 2021; Pastor et al., 2022) This situation suggests that unrestricted access to mobile data can facilitate excessive internet use. Therefore, collaboration

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010
between schools and parents is essential in establishing clear guidelines for responsible internet usage, particularly for students reliant on mobile data for their online activities.

Interestingly, while age and location did not exhibit significant correlations with internet addiction, the minor fluctuations in addiction rates among different age groups, along with similar rates between urban and rural students, point to the necessity for comprehensive interventions targeting students' online behaviors across various demographics. Factors such as the relatively close age range and limited variability in experiences between urban and rural environments might contribute to these findings. Future research should investigate younger age groups, particularly 12 to 13-year-olds, as their developmental stage may present different patterns of internet use and addiction (Kumar et al., 2023).

**Limitation and Suggestion**

This study offers significant insights into the factors linked to internet addiction among adolescents. However, it is crucial to acknowledge several limitations. The cross-sectional nature of the data prevents us from establishing causal links between the variables and internet addiction, making it difficult to determine the directionality of these relationships. Longitudinal studies are necessary to gain a more comprehensive understanding of how internet addiction evolves over time (Takahashi et al., 2022). Furthermore, the study relies heavily on self-reported data, which could be subject to personal biases and inaccuracies. Future research could be enhanced by integrating objective metrics, such as screen time tracking or app usage statistics, to provide a more accurate assessment of internet usage patterns (Marin-Dragu et al., 2023).

Despite these limitations, this study emphasizes the intricate interplay between demographic, socioeconomic, and technological elements in adolescent internet addiction. The findings highlight the necessity for focused interventions that consider gender, ethnic, and economic disparities, as well as the influence of personal device ownership and internet connectivity. Future research should prioritize the development and evaluation of prevention programs and policies tailored to diverse cultural contexts. By doing so, we can more effectively address this escalating public health issue and foster healthier internet habits among adolescents.

**Acknowledgements**

We wish to acknowledge the support of the school counsellors who played a pivotal role in facilitating the data collection process. Their dedication and cooperation significantly enhanced the efficiency and effectiveness of our research.

**References**

Ali Sabri Radeef, Ghassak Ghazi Faisal, & Ramli Musa. (2018). Translation and validation study of the Chen Internet Addiction Scale (CIAS) among Malaysian college students. *Journal of International Dental and Medical Research*, *11*(1), 32–37. http://www.jidmr.com

Anderson, M., & Jiang, J. (2018). *Teens, Social Media & Technology* . Pew Research Center. https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/

Arifin, S., Kamaruddin, S. H., Azlan, S. C., Muhamad Nawi, R., Arifin, J., & Muhammad, H. (2023). The Prevalence of Internet Addiction among University Students in Malaysia.

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010
*International Journal of Academic Research in Business and Social Sciences*, *13*(11). https://doi.org/10.6007/ijarbss/v13-i11/19268

Boukadida, Y., Fekih-Romdhane, F., Away, R., Damak, R., Ghrissi, F., & Cheour, M. (2023). Internet addiction and psychological distress in highly schizotypal students. *European Psychiatry*, *66*, S272–S272. https://api.semanticscholar.org/CorpusID:260700718

Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, *26*(5), 1089–1097. https://doi.org/10.1016/j.chb.2010.03.012

Chung, S., Lee, J., & Lee, H. K. (2019). Personal factors, internet characteristics, and environmental factors contributing to adolescent internet addiction: A public health perspective. *International Journal of Environmental Research and Public Health*, *16*(23). https://doi.org/10.3390/ijerph16234635

Daoud, M., S. Omri, R. Feki, N. Smaoui, L. Zouari, J. Ben Thabet, M. Maalej Bouali, N. Charfi, & d M. Maalej. (2021). Prevalence ofinternet addiction in tunisian adolescents. *European Psychiatry*, *64*(S1), S572–S572. https://doi.org/10.1192/j.eurpsy.2021.1525

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers In Human Behavior*, *17*, 187–195. www.elsevier.com/locate/comphumbeh

Essau, C. A. (2022). Addictive problems among young people in low- and middle-income countries: A call for more research. In *Addictive Behaviors Reports*. Elsevier Ltd. https://doi.org/10.1016/j.abrep.2022.100442

Fu, S. C., Pang, N. T. P., & Wider, W. (2022). Relationship between Internet Addiction, Personality Factors, and Emotional Distress among Adolescents in Malaysia. *Children*, *9*(12). https://doi.org/10.3390/children9121883

Gjoneska, B., Potenza, M. N., Jones, J., Sales, C. M., Hranov, G., & Demetrovics, Z. (2022). Problematic use of the Internet in low- and middle-income countries before and during the COVID-19 pandemic: a scoping review. In *Current Opinion in Behavioral Sciences* (Vol. 48). Elsevier Ltd. https://doi.org/10.1016/j.cobeha.2022.101208

Gupta, T. (2019). Smart generation with smartphone hooked to Internet addiction. *J. Indian Assoc. Child Adolesc. Ment. Health*, *15*(3), 90–98.

Institut Kesihatan Umum. (2018). *National health and morbidity survey (NHMS): Adolescent health and nutrition survey*.

Ismail, N., Tajjudin, A. I., Jaafar, H., Nik Jaafar, N. R., Baharudin, A., & Ibrahim, N. (2021). The relationship between internet addiction, internet gaming and anxiety among medical students in a malaysian public university during covid-19 pandemic. *International Journal of Environmental Research and Public Health*, *18*(22). https://doi.org/10.3390/ijerph182211870

Jaafar, N. S., Idris, I. B., Ahmad, N., Hod, R., Baddiri, B., & Hod, R. (2022). Internet addiction and its association with depression, anxiety, and stress symptoms among allied health students in Malaysia. *Medical Journal of Indonesia*, *31*(1), 56–61. https://doi.org/10.13181/mji.oa.225820

Jabatan Perangkaan Malaysia. (2022). *Capaian dan penggunaan Internet oleh individu dan isi rumah meningkat selepas kemuncak pandemik COVID-19*. www.dosm.gov.my

Kapus, K., Nyulas, R., Nemeskeri, Z., Zadori, I., Muity, G., Kiss, J., Feher, A., Fejes, E., Tibold, A., & Feher, G. (2021). Prevalence and risk factors of internet addiction among hungarian high school students. *International Journal of Environmental Research and Public Health*, *18*(13). https://doi.org/10.3390/ijerph18136989

Khodabakhsh, S., Ramasamy, S., Teng, T. Y., & Leng, C. S. (2021). Impact Of Internet Addiction On Health Anxiety In Malaysian Youth During Covid-19 Pandemic.

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010

*Malaysian Journal of Medical Research*, *5*(2). https://doi.org/10.31674/mjmr.2021.v05i02.003

Kumar, K., Goel, K. K., & Mehra, A. (2023). Internet Addiction and Its Association with Demographic Variables, Depression, Anxiety, and Psychological Well-being in College Students. *Annals of Neurosciences*, *31*, 21–27. https://api.semanticscholar.org/CorpusID:258769054

Kumar, K., Goel, K., & Mehra, A. (2024). Internet addiction and its association with demographic variables, depression, anxiety, and psychological well-being in college students. *Annals of Neurosciences*, *31*(1), 21–27. https://doi.org/10.1177/09727531231171979

Loh, F. H. A., Ismail, M. A.-A., Yusoff, M. S. B., & Fadzil, N. A. (2022). Prevalence of Internet Addiction and Its Relationship with Psychological Distress Among Medical Students in a Malaysian Public University. *Education in Medicine Journal*. https://api.semanticscholar.org/CorpusID:252689249

Marin-Dragu, S., Forbes, A., Sheikh, S., Iyer, R. S., Pereira dos Santos, D., Alda, M., Hajek, T., Uher, R., Wozney, L., Paulovich, F. V., Campbell, L. A., Yakovenko, I., Stewart, S. H., Corkum, P., Bagnell, A., Orji, R., & Meier, S. (2023). Associations of active and passive smartphone use with measures of youth mental health during the COVID-19 pandemic. *Psychiatry Research*, *326*. https://doi.org/10.1016/j.psychres.2023.115298

Miloš Stanković, Milkica Nešić, Svetlana Čičević, & Zhuanghua Shi. (2021). Association of smartphone use with depression, anxiety, stress, sleep quality, and internet addiction. Empirical evidence from a smartphone application, Personality and Individual Differences. *Pers. Individ. Differ*, *110342*, 168.

Montag, C., Demetrovics, Z., Elhai, J. D., Grant, D., Koning, I., Rumpf, H. J., M. Spada, M., Throuvala, M., & van den Eijnden, R. (2024). Problematic social media use in childhood and adolescence. *Addictive Behaviors*, *153*. https://doi.org/10.1016/j.addbeh.2024.107980

Mou, Q., Zhuang, J., Wu, Q., Zhong, Y., Dai, Q., Cao, X., Gao, Y., Lu, Q., & Zhao, M. (2024). Social media addiction and academic engagement as serial mediators between social anxiety and academic performance among college students. *BMC Psychology*, *12*(1). https://doi.org/10.1186/s40359-024-01635-7

Nik Jaafar, N. R., Bahar, N., Ibrahim, N., Baharudin, A., Wan Ismail, W. S., Sim, S. T., Abdul Aziz, M., & Tan, K. A. (2021). Are Malaysian Youths Overdependent on the Internet?: A Narrative Review. In *Frontiers in Psychiatry* (Vol. 12). Frontiers Media S.A. https://doi.org/10.3389/fpsyt.2021.710790

Onukwuli, V. O., Onyinye, E. N., Udigwe, I. B., Umeh, U. M., Enebe, J. T., & Umerah, A. T. (2023). Internet addiction during the COVID-19 pandemic among adolescents in southeast Nigeria and implications for adolescent care in the post-pandemic era: A cross-sectional study. *SAGE Open Medicine*, *11*. https://doi.org/10.1177/20503121231152763

Ooi, C. Y., Mooi, C. S., Ali, N., Sidek, S. K. H., Amat, A., Yatim, Y., Yahaya, Z., Shamsuddin, N., Ibrahim, I., Majid, F. A., Othman, F. S., Zakaria, N. S., Abidin, A., & Talib, N. H. (2020). Prevalence and factors associated with internet addiction among adolescents in Malaysia: a cross-sectional study. *Journal of Indian Association for Child and Adolescent Mental Health*, *16*, 33–44. https://api.semanticscholar.org/CorpusID:216422002

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010
Pastor, Y., García-Jiménez, A., & López-De-ayala, M. C. (2022). Regulatory strategies for smartphone use and problematic internet use in adolescence. *Anales de Psicologia*, *38*(2), 269–277. https://doi.org/10.6018/analesps.461771

Radeef, A. S., & Faisal, G. G. (2018). Prevalence of Internet Addiction and its association with depression, anxiety and stress among Medical Students in Malaysia. *Mediterranean Journal of Clinical Psychology MJCP*, *6*(3), 2282–1619.

Radeef, A. S., & Faisal, G. G. (2019). Internet Addiction among Dental Students in Malaysia. *Journal of International Dental and Medical Research*, *12*(4), 1452–1456. http://www.jidmr.com

Radeef, A. S., & Faisal, G. G. (2021). Internet Addiction And Its Association With Emotional Disturbances Among Nursing Students In Malaysia. In *British Journal of Medical & Health Sciences (BJMHS)* (Vol. 3). www.jmhsci.orgBJMHS4503281110

Sam, M. M. Y., Siau, C. S., Fitriana, M., Amini, M., Rabbani, M., Prawiromaruto, I. G., & Yahya, A. N. (2022). Internet use and addiction symptoms among young adults during the COVID-19 Movement Control Order: Associations with anxiety and depression. *Kasetsart Journal of Social Sciences*, *43*(1), 159–165. https://doi.org/10.34044/j.kjss.2022.43.1.22

Sánchez-Fernández, M., Borda-Mas, M., Horvath, Z., & Demetrovics, Z. (2024). Similarities and differences in the psychological factors associated with generalised problematic internet use, problematic social media use, and problematic online gaming. *Comprehensive Psychiatry*, *134*. https://doi.org/10.1016/j.comppsych.2024.152512

Shek, D. T. L., Chai, W., Dou, D., Zhu, X., Chan, C. H. M., Zhou, K., Chu, C. K. M., Chu, K.-Y., & Sun, P. C. F. (2023). Internet Addiction Amongst University Students Under COVID-19: Prevalence and Correlates. *Asian Journal on Addictions*, *1*(1).

Shen, Y., Meng, F., Xu, H., Li, X., Zhang, Y., Huang, C., Luo, X., & Zhang, X. Y. (2020). Internet addiction among college students in a Chinese population: Prevalence, correlates, and its relationship with suicide attempts. *Depression and Anxiety*. https://api.semanticscholar.org/CorpusID:218618758

Siti Mariam, A., Rasool, M. S. A., & Ahmad, S. N. A. (2022). Internet addiction in Malaysia: An overview of Uses and Gratifications Theory (Ugt). *Proceedings of the International Conference on Sustainable Practices, Development and Urbanisation (IConsPADU 2021), 16 November 2021, Universiti Selangor (UNISEL), Malaysia*, *3*, 629–636. https://doi.org/10.15405/epms.2022.10.59

Sowndarya, T. A., & Pattar, M. (2018). Pattern of internet addiction among urban and rural school students, Mangaluru, India: a comparative cross-sectional study. *International Journal of Contemporary Pediatrics*, *5*(5), 1750. https://doi.org/10.18203/2349-3291.ijcp20183005

Su, W., Han, X., Jin, C., Yan, Y., & Potenza, M. N. (2019). Are males more likely to be addicted to the internet than females? A meta-analysis involving 34 global jurisdictions. *Computers in Human Behavior*, *99*, 86–100. https://doi.org/10.1016/j.chb.2019.04.021

Su, W., Han, X., Yu, H., Wu, Y., & Potenza, M. N. (2020). Do men become addicted to internet gaming and women to social media? A meta-analysis examining gender-related differences in specific internet addiction. *Comput. Hum. Behav.*, *113*, 106480. https://api.semanticscholar.org/CorpusID:221713524

Takahashi, M., Adachi, M., Hirota, T., Nishimura, T., Shinkawa, H., Mori, H., & Nakamura, K. (2022). Longitudinal association between addictive internet use and depression in early adolescents over a 2-year period: A study using a random intercept cross-lagged model. *Computers in Human Behavior*, *132*. https://doi.org/10.1016/j.chb.2022.107251

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 9 Issue 36 (September 2024) PP. 149-162
DOI: 10.35631/JISTM.936010
Taufik, M. H., Rezali, M. S., Shahein, N. A., Sahril, N., Ying, C. Y., Wahab, N. A., & Kassim, M. S. A. (2021). Internet Addiction and Its Associated Factors among School-going Adolescents in Malaysia. *International Journal of Public Health Research*. https://api.semanticscholar.org/CorpusID:239692406

Trumello, C., Vismara, L., Sechi, C., Ricciardi, P., Marino, V., & Babore, A. (2021). Internet addiction: The role of parental care and mental health in adolescence. *International Journal of Environmental Research and Public Health*, *18*(24). https://doi.org/10.3390/ijerph182412876

Victor, S. A., Ibrahim, M. S., Yusuf, S., Mahmud, N., Bahari, K. A., Yoke Ling, L., & Abd Mubin, N. N. (2024). Social media addiction and depression among adolescents in two Malaysian states. *International Journal of Adolescence and Youth*, *29*(1). https://doi.org/10.1080/02673843.2023.2292055

Xie, Y., Zhou, X., Sun, H., Fan, J., Kuang, J., Zhou, R., & Chen, J. (2023). Prevalence of Internet Addiction and Its Correlates among Adolescents during the COVID-19 Pandemic: A Cross-Sectional Study in Nanchang, China. *Asian Journal On Addiction*, *1*(1).

Yang, Z., Griffiths, M. D., Yan, Z., & Xu, W. (2021). Can watching online videos be addictive? A qualitative exploration of online video watching among chinese young adults. *International Journal of Environmental Research and Public Health*, *18*(14). https://doi.org/10.3390/ijerph18147247

Young, K. (1998). Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior.*, 237–244.

Young, K. (2004). Internet Addiction: A New Clinical Phenomenon and Its Consequences. *American Behavioral Scientist*, *48*(4), 402–415. https://doi.org/10.1177/0002764204270278

Zaabah, I. L., Sulaiman, N. A. S., & Mohd Zain, N. (2022). Internet Addiction Among University Students at School of Health Sciences, Universiti Sains Malaysia During the Covid-19 Pandemic. *Asian Journal of Medicine and Biomedicine*, *6*(S1), 217–218. https://doi.org/10.37231/ajmb.2022.6.S1.592