INTERNET ADDICTION AND DEPRESSION AMONG ADOLESCENTS DURING COVID-19 PANDEMIC IN PUNCAK ALAM: A CROSS-SECTIONAL STUDY

Mohd Azhari AF[1], Mohd Makhtar NH[2], Isa R[3] and Isa SNI[4].

[1]Pantai Hospital Batu Pahat 9s, Jalan Bintang 1, Taman Koperasi Bahagia, 83000 Batu Pahat, Johor

[2]Thomson Hospital Kota Damansara 11, Jalan Teknologi, Taman Sains Selangor, 1, PJU 5, Kota Damansara, 47810 Petaling Jaya, Selangor

[3]Centre for Nursing Studies, Faculty of Health Science, Universiti Teknologi MARA (UiTM) Puncak Alam Campus, 42300 Selangor, Malaysia

[4]Department of Basic Sciences, Faculty of Health Science, Universiti Teknologi MARA, (UiTM) Puncak Alam Campus, 42300 Selangor, Malaysia

Correspondence:

Roslinda bt Isa,
Centre for Nursing Studies,
Faculty of Health Sciences,
UiTM Selangor, Puncak Alam Campus,
42300 Bandar Puncak Alam
Email: roslindaisa@uitm.edu.my

Abstract

The global impact of the COVID-19 pandemic has led to substantial disruptions on a worldwide scale. People all over the world were expected to face a variety of mental health issues during this outbreak. Internet addiction may become a serious problem among adolescents, especially during online distance learning. Assessing adolescents' heavy Internet use is crucial for determining their psychological health. Thus, this study aimed to determine the level of internet addiction and depression among adolescents in Puncak Alam, Selangor, during the COVID-19 pandemic. A cross-sectional study was conducted on 174 respondents aged 13 to 17. The convenience sampling method was employed, where respondents completed questionnaires comprising eight items related to demographic information, 19 items based on the Internet Addiction Test (IAT), and 10 items related to the Depression scale, all specific to the COVID-19 pandemic period. The study revealed that 36.8% of respondents exhibited a mild level of Internet addiction, and 45.5% displayed a mild level of depression. A statistically significant (p = 0.01) yet weak positive correlation (r = 0.195) was identified between Internet addiction and depression, indicating that as Internet addiction increases, so does the level of depression, albeit weakly. These findings highlight the presence of mild Internet addiction and depression among adolescents. In the wake of the pandemic, it becomes crucial to tackle these issues through focused interventions and continuous research, aiming to bolster the mental health of young individuals in this digital era.

Keywords: Adolescent, COVID-19, Depression, Internet Addiction, Movement Control Order (MCO)

Introduction

The COVID-19 epidemic quickly and drastically changed the lives of young people all around the country in the first few months of 2020. Depression was discovered to be a widespread condition in children under 18 due to the COVID-19 pandemic (1). A previous study conducted in Malaysia reported a depression prevalence rate of 32.7% among secondary school students (2). This underscores the high prevalence of depression among adolescents, particularly during the COVID-19 pandemic.

High rates of anxiety, depression, and post-traumatic symptoms were identified among children during the COVID-19 pandemic (3). During the COVID-19 epidemic stage, many adolescents faced disruptions in their schooling, leading to limited interaction with classmates and a break in their social network, which was previously maintained through virtual engagement (4). Lockdown, suspension of studies, and shift to online learning have substantially increased Internet use among adolescents from 5.46 hours per day before COVID-19 to 9.74 hours per day after COVID-19 (5). A recent study revealed that routines at school are crucial coping techniques, particularly for young people with mental health concerns (6). Moreover, evidence has shown that school breaks are associated with reduced physical activity, heightened screen time, irregular sleep schedules, and less healthy diets among children and adolescents (7). Prolonged

episodes of social isolation and use of technology engagement present the potential of ingraining unhealthy lifestyle routines, creating difficulties in the process of readaptation once the COVID-19 crisis is over (8).

A previous study identified a notable rise in the utilisation of social media and streaming platforms amidst the pandemic (9). Adolescents often utilised the Internet throughout the epidemic for various activities, including engaging in distant learning, schoolwork, playing video games, and establishing social connections (10). Overusing computers and the internet create physical, mental, and social problems (11). Internet addiction is related to depression among adolescents and has been linked to social anxiety, despair, and low self-esteem (12). Hence, this study aims to investigate the levels of internet addiction and depression among adolescents in Puncak Alam during the COVID-19 pandemic. This study can provide insights into the potential long-term effects of the pandemic on adolescent mental health. Understanding how Internet addiction and depression manifest during this period can help anticipate and address any lingering mental health challenges in the post-pandemic era.

Materials and Methods

Study design and population

A cross-sectional study was conducted targeting adolescents within the Puncak Alam Community, focusing on individuals aged 13 to 17 years old.

Sample

Data collection commenced from February 2022 to May 2022 among adolescents in the Puncak Alam Community, utilising convenience sampling. The sample size was determined to be 332 using the Raosoft Calculator Software, based on a 5% margin of error and a 95% confidence level, from a target population of 2413. However, due to time constraints, the researchers could only enlist 174 respondents for participation in the study. The inclusion criteria for this study specified respondents to be between the ages of 13 and 17, without diagnosed mental illness, having consistent access to the Internet, and possessing parental consent for their involvement in the study.

Instruments

The questionnaires are divided into four sections. The first part includes questions on sociodemographic details like gender and age. The second part focuses on Internet usage, encompassing aspects such as engagement in online distance learning, the utilisation of the Internet for educational purposes during online learning sessions, use of the Internet for non-educational activities like browsing social media, the amount of time spent on the Internet daily, and whether there is a lack of motivation experienced throughout the day when the Internet is not used.

The third section centres on the Internet Addiction Test, with the questionnaire being adapted from the original version of the Internet Addiction Test (13). This section consists of 20 questions with a Six-point Likert scale: "0 = Not Applicable, 1 = Rarely, 2 = Occasionally, 3 = Frequently, 4 = Often, and 5 = Always". The maximum score is 100 points. The higher the score is, the higher the severity of the problem. Total scores can range from 0-30, which indicates the average level of Internet usage; 31-49, which means a mild level of Internet addiction; 50-79, which shows a moderate level of Internet addiction; and 80-100, which indicates severe dependence upon the Internet. The Cronbach's alpha coefficient for the Internet addiction test questionnaire is 0.830.

The fourth section focuses on assessing depression, with the questionnaire adapted from the original version used in the study "Incidence of Anxiety and Depression among Medical Students during the COVID-19 pandemic" (14). The questionnaire consists of 10 questions with 4 points on the Likert scale: "1 = not at all, 2 = several days, 3 = more than half the days, and 4 = nearly every day". For the last question of the depression scale, researchers used different Likert scales: "1 = not difficult at all, 2 = somewhat difficult, 3 = very difficult, and 4 = extremely difficult". The scoring of this questionnaire was based on the depression score and level of depression subscale, in which 0-10 indicates minimal depression, 11-20 indicates mild depression, 21-30 indicates moderate depression, and the last one, 31-40 indicates severe depression. The Cronbach's alpha coefficient for the depression scale questionnaire is 0.878.

Data collection

For this study, ethical approval from The Research Ethics Committee (REC) of Universiti Teknologi MARA (UiTM) was obtained on 14 February 2022, and the reference number is REC/12/2021 (UG/MR/1157). In this study, the researchers initiated a contact with the community leaders of each residential area in Puncak Alam to identify parents of children aged 13-17. Subsequently, parents with eligible children were contacted via WhatsApp to seek their consent for their children's participation in the study. Upon receiving parental approval, which was formalised through a consent form sent and returned via WhatsApp, the researchers then approached the respondents. They distributed the questionnaires and detailed the study procedures through WhatsApp. Each respondent was given a consent form to complete before participating in the survey.

Data analysis

The data were analysed using Statistical Package for Social Sciences (SPSS) version 26 using descriptive statistics, which mainly measures frequency and percentage. The statistical analysis used in this study was Pearson Correlation to determine the correlation between Internet addiction and depression among adolescents during the COVID-19 pandemic in Puncak Alam. The One-way ANOVA analysis

was employed to explore the relationship between demographic variables and levels of Internet addiction and depression among adolescents during the COVID-19 pandemic in Puncak Alam.

Results

Demographic characteristics of respondents

Table 1 shows the demographic characteristics of respondents. Most of the respondents were girls, 67.2% (117). Most of the respondents were 17 years old (33.3%). Almost all respondents (69.0%) were currently doing online distance learning, 158 (90.8%) were using the Internet for school purposes, and 153 (87.9%) were using social media. 103 (59.2%) spent more than 4 hours daily on the Internet, and 108 (62.1%) felt unmotivated throughout the day when not using the Internet.

Table 1: Demographic characteristics of respondents (n = 174)

Characteristics		Frequency (n)	Percentage (%)
Gender	Boy	57	32.8
	Girl	117	67.2
Age (years old)	13	14	8.0
	14	29	16.7
	15	29	16.7
	16	44	25.3
	17	58	33.3
Ongoing online distance learning	Yes	120	69.0
	No	54	31.0
Use the Internet for school	Yes	158	90.8
	No	16	9.2
Use the Internet apart from school	Yes	153	87.9
	No	21	12.1
Time spent on the Internet daily (hour daily)	<1	15	8.6
	1–3	56	32.2
	≥4	108	62.1
Demotivated if not use the Internet daily	Yes	108	62.1
	No	66	37.9

Level of internet addiction

Table 2 shows the frequency and percentage of Internet addiction.

Table 3 shows the level of Internet addiction among adolescents. It was found that 43 (24.7%) had an average level of Internet addiction, 64 (36.8%) had a mild level of Internet addiction, 61 (35.1%) had a moderate level of Internet addiction, and 6 (3.4%) had a severe level of Internet addiction.

Level of depression

Table 4 presents the frequency and percentage of responses for each item on the depression scale, as answered by the respondents during the COVID-19 pandemic.

Table 5 shows the level of depression among adolescents based on the depression total score. It was found that 79 (45.5%) of the adolescents had mild depression, while 8 (4.6%) of the adolescents were minimally depressed, respectively.

Association between demographic data and internet addiction

Table 6 presents the association between demographic data and Internet addiction and depression. There is no significant association between demographic data and Internet addiction except for being demotivated if not using the Internet daily; the result was statistically significant with Internet addiction, t (172) = 5.968, p < 001.

Association between demographic data and depression

Table 7 shows the result of the association between demographic data and depression. The result shows no significant association between socio-demographics and depression, with a p > 0.05.

Correlation between internet addiction and depression

Table 8 shows the correlation between two variables: Internet addiction and depression. There is a significant linear correlation between Internet addiction and depression (P value < 0.001). The observed correlation coefficient (r) is 0.195, which suggests a weak correlation (r < 0.25).

Discussion

Level of internet addiction among adolescents during COVID-19 pandemic in Puncak Alam

In this study, most adolescents had a mild level of Internet addiction during the COVID-19 pandemic in Puncak Alam. Internet addiction can have a profound impact on the physical, cognitive, and psychological development of adolescents, potentially leading to serious issues (7). This study found that although the majority of the respondents who use the Internet and become addicted, 36.8% had a mild level, 35.1% had a moderate level, and 3.4% had a severe level of Internet addiction. This shift has resulted in adolescents spending more time on the Internet to meet the demands of online coursework. Additionally, curfews and household rules imposed during this period have increased adolescent Internet usage. Virtual interaction with friends and peers for social contact has also increased online activity. Given these circumstances, it is crucial for parents to actively engage in managing their child's Internet usage. Providing guidance, setting boundaries,

Table 2: Internet addiction test (n = 174)

Items Not applicable		Frequency, n (%)					
		Rarely	Occasionally	Frequently	Often	Always	
1.	How often do you find that you stay online longer than you intended?	3 (1.7)	19 (10.9)	55 (31.6)	42 (24.1)	36 (20.7)	19 (10.9)
2.	How often do you neglect household chores to spend more time online?	8 (4.6)	45 (25.9)	52 (29.9)	30 (17.2)	23 (13.2)	16 (9.2)
3.	How often do you form new relationships with fellow online users?	13 (7.5)	45 (25.9)	43 (24.7)	31 (17.8)	29 (16.7)	13 (7.5)
4.	How often do others in your life complain to you about the amount of time you spend online?	13 (7.5)	61 (35.1)	44 (25.1)	22 (12.6)	22 (12.6)	12 (6.9)
5.	How often do your grades or schoolwork suffer because of the amount of time you spend online?	16 (9.2)	44 (25.3)	49 (28.2)	32(18.4)	22 (12.6)	11 (6.3)
6.	How often do you check your email before something else that you need to do?	20 (11.5)	47 (27.0)	46 (26.4)	26 (14.9)	20 (11.5)	15 (8.6)
7.	How often does your job performance or productivity suffer because of the Internet?	17 (9.8)	47 (27.0)	49 (28.2)	25 (14.4)	28 (16.1)	8 (4.6)
8.	How often do you become defensive or secretive when anyone asks you what you do online?	25 (14.4)	39 (22.4)	39 (22.4)	20 (11.5)	38 (21.8)	13 (7.5)
9.	How often do you block out disturbing thoughts about your life with soothing thoughts on the Internet?	16 (9.2)	36 (20.7)	47 (27.0)	28 (16.1)	27 (15.5)	29 (11.5)
10.	How often do you find yourself anticipating when you will go online again?	12 (6.9)	43 (24.7)	44 (25.3)	27 (15.5)	35 (20.1)	13 (7.5)
11.	How often do you fear that life without the Internet would be boring, empty, and joyless?	17 (9.8)	41 (23.6)	39 (22.4)	22 (12.6)	32 (18.4)	23 (13.2)
12.	How often do you snap, yell, or act annoyed if someone bothers you while you are online?	19 (10.9)	59 (33.9)	36 (20.7)	16 (9.2)	31 (17.8)	13 (7.5)
13.	How often do you lose sleep due to being online?	15 (8.6)	36 (20.7)	45 (25.9)	30 (17.2)	25 (14.4)	23 (13.2)
14.	How often do you feel preoccupied with the Internet when off-line or fantasise about being online?	21 (12.1)	44 (25.3)	48 (27.6)	28 (16.1)	19 (10.9)	14 (8.0)
15.	How often do you find yourself saying, "just a few more minutes" when online?	10 (5.7)	31 (17.8)	40 (23.0)	38 (21.8)	34 (19.5)	21 (12.1)
16.	How often do you try to cut down the amount of time you spend online but fail?	10 (5.7)	31 (17.8)	40 (23.0)	38 (21.8)	34 (19.5)	21 (12.1)
17.	How often do you try to hide how long you have been online?	20 (11.5)	39 (22.4)	36 (20.7)	29 (16.7)	33 (19.0)	17 (9.8)
18.	How often do you choose to spend more time online over going out with others?	15 (8.6)	39 (22.4)	52 (29.9)	22 (12.6)	31 (17.8)	15 (8.6)
19.	How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?	26 (14.9)	50 (28.7)	37 (21.3)	19 (10.9)	21 (12.1)	21 (12.1)

Table 3: Level of internet addiction among adolescents (n = 174)

Variables	Frequency, n	Percentage, %
Normal	43	24.7
Mild	64	36.8
Moderate	61	35.1
Severe	6	3.4
Total score (mean, SD)	44.41	18.87

Table 4: Depression scale during the COVID-19 pandemic (n = 174)

Items	Frequency, n (%)			
	Not at all	**Several days**	**More than half the days**	**Nearly everyday**
1. Little interest or pleasure in doing things.	56 (32.3)	83 (47.7)	25 (14.4)	10 (5.7)
2. Feeling down, depressed, or hopeless	43 (24.7)	90 (51.7)	24 (13.8)	17 (9.8)
3. Trouble falling asleep or sleeping too much	39 (22.4)	74 (42.5)	28 (16.1)	33 (16.1)
4. Feeling tired or having little energy	32 (18.4)	100 (57.5)	22 (12.6)	20 (11.5)
5. Poor appetite or overeating	65 (37.4)	53 (30.5)	32 (18.4)	24 (13.8)
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	50 (28.7)	58 (33.3)	37(21.3)	29 (16.7)
7. Trouble concentrating on things, such as reading the newspaper or watching TV	72 (41.4)	57 (32.8)	35 (20.1)	10 (5.7)
8. Moving or speaking slowly is something that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	66 (37.9)	57 (32.8)	28 (16.1)	23 (13.2)
9. Thought that you would be better off dead or hurting yourself	68 (39.1)	52 (29.9)	36 (20.7)	18 (10.3)
	Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
10. How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?"	76 (43.7)	57 (32.8)	27 (15.5)	14 (8.0)

Table 5: Level of depression among adolescents (n = 174)

Category	Frequency, n	Percentage, %
Minimal	8	4.6
Mild	79	45.5
Moderate	71	40.8
Severe	16	9.2
Total score (mean, SD)	30.64	6.692

Table 6: Association between demographic data and internet addiction (n = 174)

Variables	Category	Internet addiction					
		n	Mean (SD)	t-stats (df)	X² (df)	F-stats (df)	p-value
Gender	Boy	57	2.123 (0.888)	-0.541 (172)	-	-	0.409[b]
	Girl	117	2.197 (0.823)				
Age (years old)	13	14	2.286 (0.914)	-	-	1.267 (3;170)	0.287[a]
	14	29	2.138 (0.875)				
	15	29	2.345 (0.857)				
	16	44	2.091 (0.858)				
	17	58	2.138 (0.805)				
Ongoing online distance learning	Yes	120	2.242 (0.879)	1.624 (172)	5.857 (3)	-	0.119[c]
	No	54	2.019 (0.739)				
Use the Internet for school	Yes	158	2.178 (0.849)	0.236 (172)	-	-	0.814[b]
	No	16	2.125 (0.806)				
Use the Internet apart from school	Yes	153	2.190 (0.841)	0.723 (172)	-	-	0.471[b]
	No	21	2.048 (0.865)				
Time spent on the Internet daily (per hour)	<1	15	1.667 (0.724)	-	-	2.075 (3;170)	0.105[a]
	1–3	56	2.143 (0.883)				
	≥4	108	2.262 (0.816)				
Demotivated if not use the Internet daily	Yes	108	2.444 (0.789)	5.968 (172)	-	-	**<0.001[b]**
	No	66	1.727 (0.735)				

[a]One-way ANOVA test
[b]Independent t-test
[c]Chi-square test

Table 7: Association between demographic data and depression (n = 174)

Variables	Category	Depression				
		n	Mean (SD)	t-stats (df)	F-stats (df)	p-value
Gender	Boy	57	2.526 (0.382)	-0.249 (172)	-	0.307[b]
	Girl	117	2.556 (0.700)			
Age (years old)	13	14	2.786 (0.699)	-	1.535 (3;170)	0.207[a]
	14	29	2.621 (0.677)			
	15	29	2.621 (0.728)			
	16	44	2.546 (0.848)			
	17	58	2.414 (0.650)			
Ongoing online distance learning	Yes	120	2.550 (0.743)	0.109 (172)	-	0.914[b]
	No	54	2.537 (0.692)			
Use the Internet for school	Yes	158	2.538 (0.719)	-0.456 (172)	-	0.649[b]
	No	16	2.625 (0.806)			
Use the Internet apart from school	Yes	153	2.549 (0.724)	0.149 (172)	-	0.882[b]
	No	21	2.523 (0.749)			
Time spent on the Internet daily (hour daily)	Less 1	15	2.666 (0.723)	-	0.470 (2)	0.626[a]
	1-3	56	2.589 (0.681)			
	More 4	103	2.504 (0.752)			
Demotivated if not use the Internet daily	Yes	108	2.555 (0.674)	0.222 (172)	-	0.825[b]
	No	66	2.530 (0.808)			

[a]One-Way ANOVA test
[b]Independent t-test

Table 8: Correlation between internet addiction and depression (n = 174)

Variables	Level of depression	
	r	*p*-value
Level of Internet addiction	0.195*	0.010

*Pearson's correlation

and fostering open communication about responsible online behaviour is essential to ensure adolescents' well-being and healthy development in the digital age. A previous study also states that to prevent adolescent Internet addiction, parents should limit and supervise their children's online usage (15).

Level of depression among adolescents during COVID-19 pandemic in Puncak Alam

In this study, most adolescents had mild depression during the COVID-19 pandemic in Puncak Alam. A study found that spending more than three hours daily in sedentary behaviour was connected with a 20% higher risk of developing depressive symptoms (16). This study revealed that a considerable proportion of adolescents experienced mild depression, with 79 individuals accounting for 45.4% of the sample population. Several studies conducted before the COVID-19 pandemic in Turkey revealed that 18.8% to 19.8% of teenagers were found to have depression (17). The implementation of curfews, quarantine restrictions, and school closures as a response to the COVID-19 pandemic has triggered a surge in various psychological issues among adolescents. According to research conducted in Germany, approximately two-thirds of adolescents are currently contending with the consequences of the pandemic, resulting in elevated levels of anxiety and exacerbated mental health conditions compared to the pre-pandemic period (18). As a result, the impact of the COVID-19 pandemic on adolescents has established a vulnerable period characterised by issues such as post-traumatic stress disorder, disrupted sleep patterns, depression, anxiety, feelings of isolation, loneliness, substance misuse, thoughts of self-harm, and instances of domestic violence (19, 20).

Association between demographic data and internet addiction among adolescents during COVID-19 pandemic in Puncak Alam

This study's findings indicate that the gender of boys and girls was not statistically significant with Internet addiction. This finding contrasts with pre-COVID-19 studies that reported gender differences in Internet addiction, where boys displayed higher levels of addiction (21, 22). The divergent personality traits of boys and girls and the goal of Internet use may frequently be used to explain the gender gap in problematic Internet usage. It has been suggested that girls have better mental control and self-control, and their earlier biopsychosocial development may lessen the likelihood of developing an Internet addiction (10).

Furthermore, the study uncovered that 15-year-olds exhibit a higher average score on the Internet Addiction Test (IAT), with a mean of 2.286 and a standard deviation of 0.914. This finding suggests that individuals in this age group are more prone to high-level internet addiction relative to their peers in other age brackets, implying that younger students may be allocating more time to online activities. Internet usage for entertainment purposes is more common among lower-class students, who also tend to experience less stringent parental monitoring (23). This study found no statistically significant relationship between the variables ongoing online distance learning, using the Internet for school, and using the Internet apart from school with Internet addiction. However, the mean IAT score for the category yes of variables ongoing online distance learning, using the Internet for school, and using the Internet apart from school are higher. This result indicates that Internet users can relatively expose themselves to Internet addiction among adolescents.

Association between demographic data and depression among adolescents during COVID-19 pandemic in Puncak Alam

This study found that severe types of depression affect girls (67.2%) more frequently compared to boys (32.8%). This finding is similar to a study by Sahril et al., who found that girls are more prone than boys to indicate experiencing more severe depressive symptoms (1). Additionally, there is the notion that female adolescents are expected to perform less well than male adolescents in terms of abilities and accomplishments (1). The expectation for girls to perform less well in certain domains might lead to increased pressure, stress, and negative self-perception, contributing to higher rates of depressive symptoms. Gender stereotypes and societal norms that prescribe specific roles and behaviours for girls and boys can impact mental health outcomes. Another factor that might be related to gender and cultural background is that boys and adolescents tend to attempt to hide their depressive symptoms unless they are very severe.

In terms of age, the data indicate that adolescents aged 16-17 years have a higher prevalence of depression than adolescents who are 13-15 years old. A previous study showed that female adolescents between 15 and 18 had higher CES-D scores and a higher risk of depression (19). During the lockdown, older adolescents showed higher depressive symptoms than younger adolescents (24). Another significant factor to consider is adolescents' inherent need for social contact and interpersonal relationships. Research indicates that peer connections play a vital role during adolescence, with adolescents being particularly motivated to form and maintain social bonds (25).

On the contrast between upper and lower-secondary adolescents, it was observed that individuals in upper-secondary education exhibit a higher susceptibility to depression in comparison to their counterparts in lower-

secondary education. This heightened vulnerability can be attributed to the increased academic pressures, more challenging subject matter, and elevated expectations for academic achievement that students encounter at this stage of their education. The pressure to excel in exams, secure college admissions, and make future career decisions can contribute to stress and anxiety, potentially leading to depression. In a previous study, researchers discovered that students in senior secondary schools were more likely to experience depression than junior secondary school students (19).

Correlation between internet addiction and depression among adolescents during COVID-19 pandemic in Puncak Alam

This study found a weak correlation between Internet addiction and depression among adolescents in Puncak Alam. As all the respondents have access to the Internet, it was assumed that they would show signs of Internet addiction and depression. This study found a positive correlation between increases in Internet addiction and depression. This relationship can be explained by the context in which adolescents found themselves housebound due to COVID-19 pandemic restrictions. The phase of adolescence, characterised by the development of self-identity, is marked by an increased need to communicate emotions and thoughts (18). Due to the restrictions on outdoor activities during the pandemic, adolescents have turned to online activities to fulfil fundamental psychological needs like affection, a sense of belonging, security, and self-worth. Previous studies also report that youngsters increasingly use the Internet to learn, play video games, shop, watch movies, access social media, and socialise. These activities also boost their moods and reduce their distress (10). Under parental supervision, adolescents have been able to balance their Internet usage. The transition to the online platform during the pandemic to fulfil psychological needs has positive and negative aspects. Acknowledging the benefits of online connectivity, especially in maintaining social connections and supporting learning and creativity, is crucial. However, it is equally important to address the potential drawbacks, such as digital fatigue, social isolation, and risks associated with online interactions.

This research study has several limitations that warrant consideration. Firstly, there is a constraint related to the sample size, as the intended sample size was not fully achieved. While the initial target was 322 respondents, only 174 could complete the study within the allotted time frame. Secondly, the study's geographical limitation to Puncak Alam may restrict the generalizability of the findings. Focusing solely on this specific area could limit the application of the results to a broader and more diverse population.

Conclusion

This study reveals that a majority of adolescents experienced mild levels of Internet addiction and depression during the COVID-19 pandemic. The findings suggest a mild severity of both conditions and indicate a weak correlation between Internet addiction and depression among the adolescent respondents. Adolescents and their parents should be aware of the adverse effects of excessive Internet addiction and its association with depression. Gender, age, education level, and daily Internet use characteristics were associated with Internet addiction and depression. Sociodemographic factors such as age and gender should be considered when implementing a protective intervention during a pandemic. Both parents and adolescents must understand the connection between depression and Internet addiction. Adolescents could benefit from education within the school system regarding the adverse effects of excessive Internet usage, the risks of addiction, and the potential correlation with depression.

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Competing interests

The authors declare that they have no competing interests.

Ethical Clearance

Ethical approval from The Research Ethics Committee (REC) of Universiti Teknologi MARA (UiTM) was obtained on 14 February 2022, and the reference number is REC/12/2021 (UG/MR/1157). The consent form was provided to both parents and respondents. If the respondents agreed to participate, they were then permitted to proceed with answering the questionnaires.

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