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Internet use and addiction symptoms among young adults during the COVID-19 Movement Control Order: Associations with anxiety and depression

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Article Info

Abstract

The disruptions caused by the COVID-19 pandemic lockdown have encouraged increased internet use and addiction among young adults. Past studies have indicated that internet addiction is often associated with depression and anxiety. The study aimed to examine the duration of internet use; estimate the prevalence of screening positive for internet addiction; and examine the influence of internet addiction symptoms on depression and anxiety. A cross-sectional survey was conducted. The survey incorporated the Internet Addiction Test (IAT), Generalized Anxiety Disorder 7-Item (GAD-7), Patient Health Questionnaire (PHQ-9), Rosenberg Self-Esteem Scale (RSE), and questions on the duration of internet use, time of sleep, and sleep duration. Data gathered from 226 participants (Mean age = 21.14 years; 62.8 percent females) revealed that the average duration spent online was 10.36 hours per day, approximately double the average duration reported in other pre-pandemic studies in Malaysia. The study also estimated that about 60 percent of the participants screened positive for internet addiction, in comparison to 36.9 percent in another pre-pandemic Malaysian study. Furthermore, young adults who slept later (1.00 am and after) were more likely to be addicted to the internet. Internet addiction symptoms were the most influential predictor of depression and anxiety. Future studies should include a larger sample size of young adults who are working or are unemployed, and carrying out a prospective longitudinal study could better document the effects of various stages of the COVID-19 pandemic on internet addiction.

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Introduction

The COVID-19 disease was first detected in Wuhan, China, and has since spread to many countries in the world, with 131,487,572 COVID-19 cases confirmed worldwide, and 352,029 cases in Malaysia as of 7 April 2021 (World Health Organization [WHO], 2021). The situation necessitated that individuals stay at home to quell the spread of the disease through lockdown measures, such as the Movement Control Order (MCO) enacted on March 18, 2020 in Malaysia. As a result of shifting to online rather than face-to-face interactions, the duration on the internet use increased after the pandemic (Dong, Yang, Lu, & Hao , 2020).

Internet addiction refers to the compulsive and excessive use of the Internet to the extent of losing a sense of time and impairing normal functioning (Younes et al., 2016). In this regard, young adults are an at-risk group for developing internet addiction, as they are more likely to use the internet for a number of pursuits including leisure, education, and work activities (Islam et al., 2020). During the COVID-19 lockdown, the risk of internet addiction could be increased due to the dependence on the internet to perform daily activities and as an outlet for mental pressures (Siste et al., 2020). In Mexico, 10.6 percent had at least moderate internet addiction during the pandemic (Priego-Parra et al., 2020). Another survey in India indicated that 20 percent of the Internet users were moderately addicted to the Internet (Prakash, Yadav, & Singh, 2020).

Internet addiction could have several impacts on mental health, such as greater severity of depression (Seki, Hamazaki, Natori, & Inadera, 2019) and anxiety (Soulioti, Stavropoulos, Christidi, Papastefanou, & Roussos, 2018). A recent study in the Malaysian context by Ismail et al. (2020) revealed that internet addiction was the only consistent predictor across depression, anxiety, stress, and suicidality among public university students. Other pre-pandemic studies in Malaysia (Othman & Lee, 2017; Radeef & Faisal, 2018), and international studies conducted during the COVID-19 pandemic (e.g., Elhai, Yang, McKay, & Asmundson, 2020) also indicated a relationship between internet addiction, depression, and anxiety. This could be due to the COVID-19 lockdown impacts on economic, physical and psychological stressors (Ho, Chee, & Ho, 2020).

The general strain theory (GST) is an approach used to depict the phenomenon of internet use and addiction associated with anxiety and depression in this study. This theory proposes that a negative experience will trigger negative emotions such as depression and despair, which may subsequently lead to problematic behaviors (Agnew, 2006). In this context, the theory may explain that life stresses associated with the COVID-19 pandemic will arouse negative emotions, which in turn lead to maladaptive behavior such as internet addiction.

However, there has been a dearth of studies addressing internet addiction in Asia during the COVID-19 pandemic. Therefore, this study had the following objectives, to (1) examine the extent of internet use; (2) estimate the prevalence of positive screens for internet addiction; and (3) examine internet addiction symptoms as a predictor of depression and anxiety while adjusting for demographic variables, time spent on the internet and self-esteem among a sample of young adults during the COVID-19 MCO in the Klang Valley, Malaysia.

Methodology

Study Design, Location, and Sampling Criteria

This was a cross-sectional study. The target population in the study was young adults in the Klang Valley, which is the most densely populated area in Malaysia. Malaysian citizens between 18 and 29 years old were included, as this age group accounted for 30 percent of total internet users in Malaysia (Malaysian Communication and Multimedia Commission, 2018). To increase the generalizability of our study, we had included both students and working adults. Those unable/unwilling to provide consent were excluded.

Measures

Demographic information such as age, gender, race, occupation, occupational status, hours of sleep, time of sleep, and duration (in hours) of internet usage per day were collected.

Internet Addiction Test (IAT) was developed to measure the characteristics and behaviours of compulsive internet users (Young, 1998). It consists of 20 items and utilizes 6-point Likert scale from 0 indicating "less extreme" to 5 indicating "most extreme". A cut-off score of 43 was used to indicate internet addiction (Ching et al., 2016). The internal consistency reliability of the scale score in this study was α = .898.

The severity of general anxiety symptoms was assessed by the Generalized Anxiety Disorder 7-item (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). It consists of seven items. Each item has four responses

from 0 to 3 in which 0 = "Not at all" and 3 = "Nearly every day". Cut off scores of 5, 10, and 15 were used to indicate mild, moderate and severe anxiety, respectively. The internal consistency reliability of the scale score in this study was $\alpha = .898$.

The Patient Health Questionnaire (PHQ-9) was developed by Kroenke, Spitzer, & Williams (2001) to measure the diagnosis of depression with nine items in the questionnaire. Each item has four rating scores ranging from 1 = Not at all to 4 = Nearly every day. Cut of scores of 5, 10, and 15 were used to indicate mild, moderate and severe depression, respectively. The internal consistency reliability of the scale score in this study was $\alpha = .861$.

The measure of one's sense of self-worth was accessed using Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979). It consisted of 10 items that measure the level of self-esteem and predicts depressive and anxiety symptoms. Using Guttman scale, the ratings range from 1 to 4. In this scale, 1 indicates "Strongly Agree" to 4 indicating "Strongly disagree". The internal consistency reliability of the scale score in this study was $\alpha = .726$.

Procedures

Due to the MCO, we employed convenience sampling using pen-and-paper (for those who were still physically present in the university) and online modes (for those who switched to online studying mode) of data collection to increase the number of participants taking part in the study. Ninety participants from a private university in Malaysia were recruited using the pen-and-paper mode, from classes or common areas of the university such as the library and cafeteria. The rest of the participants (working adults, students and those unemployed/not studying) were recruited from social media platforms such as WhatsApp, Facebook, Instagram, and other sites. This study was approved by the UCSI University Institutional Ethics Committee (IEC-2020-FoSSLA-048).

Descriptive statistics were employed to present the characteristics of the study sample. χ^2 tests were used to analyze the associations between categorical variables. Multiple linear regression analyses were performed to identify significant predictors of anxiety and depression, adjusting for demographic variables, self-esteem, time spent on the internet and hours of sleep.

Results

A total of 226 participants (*Mean* age = 21.14 years; $SD = 2.19$) completed the questionnaire. Most of the participants were females (62.8%), Chinese (79.2%), students (81.4%), and working or studying from home (54%). Participants reported a mean of 8.46 hours of sleep ($SD = 1.63$) and 10.36 hours of internet usage ($SD = 5.86$). The prevalence of participants who screened positive for internet addiction symptoms in this sample was 59.7 percent (Table 1). Based on the χ^2 analysis, more people with internet addiction symptoms (64.9%) slept after 1.00 am (50.0%), χ^2 (1, $n = 226$) = 4.693, $p = .030$.

A multiple linear regression which was carried out to determine whether internet addiction predicted anxiety indicated that 28.1 percent of the variance in anxiety could be explained by variances in the predictor variables ($R^2 = .281$, $F (15,210) = 6.86$, $p < .001$). Self-esteem ($\beta = -.249$, $p < .001$) and internet addiction ($\beta = .429$, $p < .001$) significantly predicted anxiety (Table 2).

A second multiple linear regression which was carried out to determine whether internet addiction predicted depression indicated that 32.2 percent of the variance in depression could be explained by variances in the predictor variables ($R^2 = .322$, $F (15,210) = 8.14$, $p < .001$). Self-esteem ($\beta = -.181$, $p < .01$) and internet addiction ($\beta = .503$, $p < .001$) significantly predicted depression (Table 3).

Discussion

Internet use and addiction is a matter of concern among young adults, especially during the COVID-19 pandemic and restriction orders by governments such as Movement Control Order in Malaysia. This study found that the average duration spent online among the participants was 10.36 hours per day. After subtracting the average time spent on sleeping, it was found that the participants spent 68.3 percent of their waking hours on the internet. The duration reported in this study was twice as much as the average duration reported in other pre-pandemic studies in Malaysia such as a median of four hours per day (Ching et al., 2016) and a mean of 5.34 hours per day (Wan Ismail et al., 2020). Another pre-pandemic study reported that among those addicted to the internet, the mean online duration was 4.45 hours per day (Bener et al., 2019). One possible explanation is that the longer duration could be due to the switch to online learning and working during the COVID-19 MCO.

Table 1 Participant characteristics ($N = 226$) and comparisons between participants with ($n = 135$) and without ($n = 91$) internet addiction

Categorical Variables	Total n (%)	Without IA n (%)	With IA n (%)	χ^2 statistic	p
Gender				2.111	.146
Male	84 (37.20)	39 (46.4)	45 (53.6)		
Female	142 (62.80)	52 (36.6)	90 (63.4)		
Race				1.134	.769
Malay	12 (5.30)	6 (50.0)	6 (50.0)		
Chinese	179 (79.20)	69 (38.5)	110 (61.5)		
Indian	15 (6.60)	7 (46.7)	8 (53.3)		
Others	20 (8.80)	9 (45.0)	11 (55.0)		
Occupation				0.624	.732
Working	34 (15.00)	15 (44.1)	19 (55.9)		
Studying	184 (81.40)	72 (39.1)	112 (60.9)		
Unemployed & not studying	8 (3.50)	4 (50.0)	4 (50.0)		
Time of sleep				4.693	.030
Before 1am	78 (34.5)	39 (50.0)	39 (50.0)		
1am onwards	148 (65.5)	52 (35.1)	96 (64.9)		
Free internet access				0.482	.487
Yes	153 (67.7)	64 (41.8)	89 (58.2)		
No	73 (32.3)	27 (37.0)	46 (63.0)		
Continuous Variables	**Overall Mean (SD)**	**Without IA Mean (SD)**	**With IA Mean (SD)**	**t statistic**	**p**
Age	20.99 (2.13)	20.99 (2.132)	21.24 (2.233)	-0.834	.405
Hours of sleep	8.46 (1.63)	8.29 (1.614)	8.59 (1.641)	-1.354	.177
Hours spent on the internet	10.61 (5.86)	10.11 (6.174)	10.95 (5.641)	-1.047	.296

Note: IA = Internet Addiction.

Table 2 Multiple linear regression of factors associated with anxiety (GAD-7 Total Score)

Variables	B	B SE	95% CI Upper	95% CI Lower	β	t	p
Internet addiction	0.141	0.019	0.103	0.179	0.429	7.271	< .001
Self-esteem	-0.291	0.070	-0.430	-0.152	-0.249	-4.140	< .001
Internet usage hours	-0.021	0.052	0.083	0.083	-0.023	-0.394	.694
Hours of sleep	-0.142	0.198	-0.533	0.248	-0.044	-0.720	.473
Age	0.145	0.159	-0.169	0.458	0.060	0.910	.364
Gender							
Female*							
Male	0.978	0.653	-2.265	0.309	-0.090	-1.498	.136
Ethnicity							
Others*							
Malay	1.277	1.688	-2.051	4.605	0.054	0.756	.450
Chinese	3.553	1.105	-5.732	-1.375	-0.273	-3.216	.002
Indian	-2.371	1.609	-5.543	0.801	-0.112	-1.474	.142

Table 2 Continued

Variables	B	B SE	95% CI		β	t	p
			Upper	Lower			
Occupation							
Unemployed and not studying*							
Student	3.049	2.880	-2.628	8.727	0.225	1.059	.291
Employed	2.290	2.977	-3.579	8.159	0.155	0.769	.443
Mode of Working/Studying							
Neither Working nor Studying*							
Working/Studying from Home	-2.192	2.761	-7.636	3.251	-0.207	-0.794	.428
Half Working/Studying from Home	-2.101	2.746	-7.514	3.312	-0.164	-0.765	.445
Working/Studying at Workplace/University	-0.275	2.833	-5.860	5.309	-0.021	-0.097	.923
Free Internet							
No*							
Yes	-0.167	0.698	-1.542	`1.209	-0.015	-0.239	.811

Note: R^2 = .281, F (15,210) = 6.86, p < .001. GAD = Generalized Anxiety Disorder. *Reference Group.

Table 3 Multiple linear regression of factors associated with depression (PHQ-9 Total Score)

Variables	B	B SE	95% CI		β	t	p
			Upper	Lower			
Internet addiction	0.183	0.021	0.142	0.225	0.503	8.782	< .001
Self-esteem	-0.235	0.076	-0.384	-0.085	-0.181	-3.094	.002
Internet usage hours	-0.055	0.057	-0.166	0.057	-0.055	-0.967	.335
Hours of sleep	-0.178	0.213	-0.599	0.243	-0.049	-0.834	.405
Age	0.231	0.171	-0.107	0.569	0.086	1.348	.179
Gender							
Female*							
Male	0.517	0.704	-0.870	1.905	0.043	.735	.463
Ethnicity							
Others*							
Malay	1.735	1.820	-1.854	5.323	0.066	0.953	.342
Chinese	-3.644	1.191	-5.993	-1.295	-0.252	-3.058	.003
Indian	-1.964	1.735	-5.384	1.456	-0.083	-1.132	.259
Occupation							
Unemployed and not studying*							
Student	0.306	3.105	-5.816	6.427	0.020	0.098	.922
Employed	-0.776	3.210	-7.105	5.552	-0.047	-0.242	.809
Mode of working/studying							
Neither Working nor Studying*							
Working/Studying from Home	-1.937	2.977	-7.807	3.932	-0.165	-0.651	.516
Half Working/Studying from Home	-2.493	2.961	-8.329	3.344	-0.175	-0.842	.401
Full Working/Studying at Workplace/University	-0.426	3.054	-6.447	5.595	-0.029	-0.139	.889
Free Internet							
No*							
Yes	0.458	0.752	-1.025	1.941	0.037	0.609	.543

Note: R^2 = .322, F (15,210) = 8.14, p < .001. PHQ = Patient Health Questionnaire. *Reference Group.

Apart from the time spent online, this study estimated that about 60 percent of the participants screened positive for internet addiction symptoms. Compared to another pre-pandemic study in Malaysia, only 36.9 percent of the participants had internet addiction (Ching et al., 2016). However, the prevalence of internet addiction among Malaysian adolescents was higher, at 56.4 percent (Ooi et al., 2020). This could imply that the prevalence of internet addiction has risen among Malaysian youth. During the COVID-19 pandemic, the prevalence of at least moderate internet addiction (score 40 and above) was much lower in other countries, such as 10.6 percent in Mexico (Priego-Parra et al., 2020) and 20 percent in India (Prakash et al., 2020). This may be due to these general population studies focusing on all age groups, whereas according to Prakash et al. (2020), younger age groups had a higher likelihood of developing internet addiction. These comparisons should be taken with caution as the cohorts were different.

An interesting finding in our study was that there was no significant difference in the duration of internet usage between those with and without internet addiction symptoms. This is not consistent with Gupta, Khan, Rajoura, and Srivastava (2018), where those with internet addiction had a significantly increased duration spent online. An explanation could be that during the MCO, internet usage duration was elevated even among those who were not addicted to the internet because of having online classes and working from home. Therefore, in the future, increased hours spent online should not be automatically assumed to be indicative of internet addiction.

This study found that internet addiction was the most influential predictor of both anxiety and depression symptoms. The robust relationship between these variables has been reflected in other Malaysian studies (Othman & Lee, 2017; Ismail et al., 2020; Radeef & Faisal, 2018), and in international studies during the COVID-19 pandemic (Elhai et al., 2020; Priego-Parra et al., 2020). A possible reason could be people who are anxious and depressed used the internet as a coping mechanism, leading to internet addiction (Hasan & Abu Jaber, 2019). This could be especially relevant currently as the MCO may have disrupted other healthier coping mechanisms, such as seeking social support and the curtailing of normal activities like walking and exercising (Giuntella, Hyde, Saccardo, & Sadoff, 2020).

This study also revealed that those who slept late (1.00 am and after) were more likely to be addicted to the internet. Consistent with past studies, internet use after 12.00am has increased during the pandemic (Dong et al., 2020), and those with internet addiction had disturbed sleep (Karimy et al., 2020), perhaps as a result of staying up late to engage in online activities. Sleeping late among young adults is a problem as it potentially disturbs the circadian rhythm, and is associated with a number of health problems such as the development of chronic diseases in the long run (Von Ruesten, Weikert, Fietze, & Boeing, 2012).

In conclusion, this study revealed that the prevalence of positive screen for internet addiction among the study sample was nearly 60 percent. In addition, internet addiction was related to sleeping later, depression, and anxiety. The results of this study contribute to the literature by highlighting the long duration of internet use among young adults (more than half of their waking hours), and the deleterious association between internet addiction symptoms with poor mental health. Therefore, young adults with internet addiction symptoms should be screened for depression and anxiety symptoms, and be encouraged to seek professional help.

As this was a cross-sectional survey, we could not infer that depression and anxiety were caused by internet addiction symptoms, but merely that the variables were associated. In addition, the study has limited generalizability due to the low number of young adults who are working or unemployed. Future studies could employ a prospective longitudinal study design to prevent self-recall bias.

Conflicts of Interest

There is no conflict of interest.

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