



Addictive behaviours among university students in Malaysia during COVID-19 pandemic

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ABSTRACT

Introduction: Preventative measures to stop the spread of the COVID-19 have affected university students in an unprecedented manner. During the pandemic, their well-being and mental health are being shaped by online learning, home confinement, and uncertainty about their future. The overall aim of this study was to examine the frequency of three addictive-like behaviors (i.e., eating, social media, and online gaming) among university students, and their associations with mental health and self-regulation.

Methods: This study was an online-based cross-sectional study involving 178 students from a public university in Sarawak. They were asked to complete a set of questionnaires that were used to measure substance, cigarette, and alcohol use, psychological distress, anxiety towards COVID-19, self-regulation, as well as food, online gaming, and social media addiction.

Results: There was a significant increment in the duration of time spent on online gaming and social media during the COVID-19 pandemic. The prevalence of substance use was low, with 3.9% and 12% of the students reported using cigarettes and alcohol, respectively in the last 30 days. Significant positive correlations were found between the three addictive-like behaviors (food, gaming, and social media addiction) and psychological distress. Significant negative correlations were found between self-regulation and the three addictive-like behaviors as well as psychological distress.

Conclusion: Multidisciplinary efforts are needed to mitigate potential pre-existing and potential worsening addictive behaviors among university students during the COVID-19 pandemic and future pandemics and natural disasters.

1. Introduction

Since the outbreak of coronavirus disease 2019 (COVID-19), the global healthcare system has focused primarily on the physical impact of this pandemic on humans. Inevitably, this global public health emergency had also triggered significant impacts on mental health (Brooks et al., 2020; Torales et al., 2020). A nationwide survey of 52,730 respondents in China revealed about one-third of them experienced some form of psychological distress, particularly among young adults (18–30 years old) (Qiu et al., 2020). Another study reported about half of the respondents had moderate to severe psychological impacts such as stress, anxiety, and depression during the outbreak (Wang et al., 2020). These negative emotions are likely associated with home quarantine and social distancing (Brooks et al., 2020; Qiu et al., 2020; Wang et al., 2020) (see Table 1).

As the COVID-19 outbreak causes prolonged disruptions of the normal routine, it was predicted the several mental health problems such as anxiety, acute stress, posttraumatic stress symptoms, depression, suicidality, and addictive behaviors would surface (Polizzi et al., 2020). Based on the self-medication theory (Khantzian, 1997), people who experienced psychological suffering may resort to abuse substances if they lack adaptive coping skills or low self-esteem. It was believed that the use of substances could ameliorate psychological pain, thereby temporarily improve mood. The preferred choice of a substance depends on its effects to regulate one's difficult emotions. In the early phase of the COVID-19 pandemic, numerous authors had anticipated and warned the authorities of the potential surge of substance misuse (Clay & Parker, 2020; Dubey et al., 2020).

Apart from substance misuse, there was also an increased risk of developing bad habits such as spending time excessively on watching

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television, online gaming, or social media, especially prolonged indoor isolation (Lippi et al., 2020). Maraz et al. (2021) in their study, reported there was a significant rise in the frequency of several addictive-related behaviors such as compulsive shopping, substance usage, gambling, gaming, and eating excessively, in the first few months of the COVID-19 pandemic. Another survey done in China showed increased dependence on internet usage as well as alcohol drinking and smoking (Sun et al., 2020). In India, there was a notable rise in social media usage during the COVID-19 lockdown as it was the preferred medium to contact the outside world (Gupta, 2020). A similar finding of high consumption of social networks was observed in a cross-sectional study involving students from 14 Spanish universities (Gómez-Galán et al., 2020). Håkansson et al. (2020) observed increasing online gambling activities during the lockdown period most likely as a way to cope with financial and mental health concerns such as fear of the disease. Besides, some individuals tend to cope with the stress, boredom, and feeling of emptiness by emotional binge eating during quarantine, increasing the likelihood of becoming obese (Cherikh et al., 2020).

Many nations had adopted the lockdown policy, Movement Control Order (MCO) in Malaysia, to contain the spread of the COVID-19, including the closure of educational institutions (Mohammed et al., 2020). As a result, university students were advised to return home while some of them may be stranded in the university residencies due to limited operating flights or other means of public transportation (Abdullah, 2020). Fear of infection, inadequate health information, feeling trapped and bored during social isolation, and inadequate basic supplies such as food and accommodation were likely contributed to the psychological distress during the lockdown period (Brooks et al., 2020). Tang et al. (2020) observed that feeling extreme fear was a major predictor of psychological stress among college students. A recent Malaysian online qualitative survey (Mohammed et al., 2020) revealed that university students displayed negative emotions during self-quarantine. They expressed frustration with a poor internet connection, limited freedom of movement, cannot enjoy favorite food, difficulty in focusing on their assignments, limited choices of physical activities, lack of human touch, and so forth. Some of them coped with the situation by spending more time watching drama series, while others tried to learn new skills such as cooking, did more exercise, and remained in touch with their friends and family. Differences in coping strategies may be related to one's sense of self-control. As reported in numerous studies, greater self-regulation skills predicted better self-control in alcohol misuse and other addictive behaviors (Baumeister & Vonasch, 2015; Carey et al., 2004).

The studies reviewed above showed excessive drinking, eating, and screen time were common ways to cope with the lockdown. However, the extent to which these findings could be replicated to university students in Sarawak, Malaysia is unknown. Thus, this preliminary study was to investigate the presence of addictive-like behaviors among university students as coping ways during the COVID-19 pandemic. Our objectives were: 1) to determine the levels of addictive-like eating, social media, and online gaming behaviors during the pandemic, 2) to identify the psychological impact of COVID-19 pandemic on students, 3) to examine the association between addictive-like behaviors, and psychological distress and self-regulation. The findings of this study would help the university authority to understand the psychological impacts of the unprecedented crisis towards university students, specifically the addictive behaviors, and serves as a reference for local authorities to formulate and strategize policy to mitigate the mental health of students during the present and future crisis.

2. Methods and materials

2.1. Participants and procedure

The respondents were recruited using snowballing sampling method, through email with an attached link to the questionnaire on Google Form, sent through the university internal mailing system to all students, and distributed through other commonly used social media platforms i. e., Facebook and WhatsApp, with the assistance of the student council. The data collection was conducted between 4 September 2020 and 15 October 2020. The identity of the respondents was kept anonymous to ensure confidentiality. The respondents were asked to fill in an online informed consent after reading the online participant information sheet, followed by answering the online questionnaires. The study protocol was approved by the Medical Ethics Committee of the Faculty of Medicine and Health Sciences (Ref. No: FME/20/02).

The inclusion criteria of respondents in this study included being university students (undergraduate or postgraduate) from a public university in the state of Sarawak. The study was conducted in English as all students have met the required English proficiency before they can be enrolled in a program. Data of 178 participants were included in the analyses. No missing values or outliers were noted. Of these individuals, 82% (N = 146) were females, age ranged from 18 to 54 ($M = 22.56$, $SD = 2.93$). There were only 11 (6.2%) postgraduate students, and of the 167 undergraduate students, 20 (11.2%) in year 1, 38 (21.3%) in year 2, 48 (27.0%) in year 3, 46 (25.8%) in year 4, and 15 (8.4%) in year 5. All of them were Malaysians.

2.2. Measures

The participants completed a set of questionnaires:

Socio-demographic Scale was used to collect information on age, gender, ethnicity, religion, place of origin, current program status, place of stay during the lockdown.

Time spent on games and social media. This scale was developed by the authors specifically for the present study to measure the daily time spent (hours per day) on common games among university students (for example, Witch, Minecraft, Nintendo, Candy Crush, Mobile Legends) and social media platforms (for example, Facebook, YouTube, WhatsApp, Facebook messenger, WeChat, Google +, Line, Instagram, Skype, Twitter, Yahoo! Messenger, Viber, LinkedIn, Tumblr, and Snapchat) before and during the lockdown period.

Gaming Addiction Scale (GAS) (Lemmens et al., 2009) was used to measure computer and video game addiction. It consists of seven items which can be rated on a 5-point Likert scale, ranging from 1 (never) to 5 (very often), over the last six months. These items were used to measure 7 criteria (salience, tolerance, mood modification, withdrawal, relapse, conflict, and problems) for pathological gambling as listed under DSM-IV-TR (Lemmens et al., 2009). Following Lemmens et al. (2009), those who scored at least 3 ("sometimes") on all seven items were defined as monothetic gamers ("pathological gaming"). The original version of the GAS had been reported to have good internal reliability with Cronbach's alpha of 0.86 and had good concurrent and construct validity. The internal reliability of GAS in this study was good (Cronbach $\alpha = 0.90$).

Social Media Addiction Scale Student Form (SMAS-SF) (Şahin, 2018) was used to measure social media addiction. The 29-item questionnaire can be rated on a 5-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). It has good internal reliability with Cronbach alpha, varying between 0.81 and 0.86 (Şahin, 2018). The total score can be obtained by adding all the items, with high scores being indicative of excessive use of social media which was described by

(Şahin, 2018) as having “social media addiction”. The internal reliability of the SMAS-SF in this study was excellent with Cronbach α being 0.94.

Frequency of food and beverages consumption was used to measure the frequency (times per week) of taking a wide range of food and beverages, before and during the lockdown period. The scale was specifically developed for this study, which included a list of common local food and beverages. The list includes *teh tarik*, carbonated drinks, ice cream, *keropoks & kerepeks*, bubble milk tea, *nasi lemak*, cheese naan, *roti canai*, instant noodles, curry laksa, banana fritters, fried chicken, and fast food.

Modified Yale Food Addiction Scale Version 2.0 (mYFAS 2.0) (Schulte & Gearhardt, 2017) was used to measure addictive-like eating behavior. It contains 13 items; of these 11 items were based on the diagnostic criteria of substance use disorders in DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, fifth edition) and two items were used to determine the significant clinical distress and impairment. This scale can be scored in two ways: (a) For a continuous scoring method, the number of the 11 SUD criteria which the participants endorsed can be added up, with the higher numbers being indicative of more addictive-like eating behavior. (b) To assess the scale based on a ‘diagnostic’ threshold, two or more symptoms must be endorsed plus impairment of distress. For participants who met a ‘diagnosis’ of food addiction, severity thresholds were specified as follows: mild = 2–3 symptoms plus impairment or distress, moderate = 4–5 symptoms plus impairment or distress, severe = 6 or more symptoms plus impairment or distress. The mYFAS 2.0 exhibited good internal reliability, as measured by Kuder–Richardson alpha = 0.86 (Schulte & Gearhardt, 2017). It also showed good convergent and discriminant validity. Good internal reliability was reported in the present study (Cronbach α = 0.75).

Substance Use Scale adapted from the Malaysia–Global School-based Student Health Survey (GSHS) 2012 was used to measure the frequency of substance (e-cigarettes, alcohol, and substances particularly marijuana and stimulants) usage in their lifetime and the past 30 days.

Short Self-Regulation Questionnaire (SSRQ) (Carey, Neal, & Collins (2004) was used to assess the general ability to regulate behavior that helps to achieve goal-directed outcomes. It contains 31 items that can be scored on a 5-point scale, ranging from “strongly disagree” (1) to “strongly agree” (5). The higher the score, the better the person in self-regulation. It has a good overall internal consistency (Cronbach α = 0.92) (Carey et al., 2004). In the present study, the internal reliability of SSRQ was good (Cronbach α = 0.78).

Fear of COVID-19 Scale (FCV-19S) (Ahorsu et al., 2020) was used to measure anxiety towards COVID-19. It contains seven items that can be rated on a 5-point Likert-type scale, ranging from “strongly disagree” (1) to “strongly agree” (5). A total score could be calculated by adding up each item score (range from 7 to 35). It has good internal consistency (Cronbach α = 0.82) and acceptable test–retest reliability (ICC = 0.72) (Ahorsu et al., 2020). Good internal consistency was found in this study (Cronbach α = 0.85).

Kessler Distress Scale (K6) (Kessler et al., 2002) was used to measure general distress over the past 30 days before administration of the test. It contains six items that can be rated on a 5-point Likert-type scale, ranging from “None of the time” (1) to “All of the time” (5). The six items are summed, with higher scores being indicative of more psychological stress. It had great internal consistency reliability (Cronbach α = 0.89) in the original study. In this study, the internal reliability of K6 was excellent (Cronbach α = 0.93).

3. Results

3.1. Gaming and social media use

Changes from before and during the pandemic on the number of hours spent on the internet were examined using paired t-tests (Table 2).

The total hours spent on gaming increased significantly from before the pandemic ($M = 0.95, SD = 2.2$) to during the pandemic ($M = 1.33, SD = 2.8$), ($t(177) = -2.97, p < .001$). When analysing the specific types of gaming behavior, a significant increase was found for Twitch and Minecraft (Table 2). Our result on the Gaming Addiction Scale showed that only 4.5% ($N = 8$) of the participants could be defined as monothetic gamers (i.e., “pathological gaming”). On the Gaming Addiction Scale (GAS) scores, male ($M = 15.19, SD = 4.9$) had significantly higher scores compared to females ($M = 12.78, SD = 6.3$), ($F(177) = 4.13, p < .05$). Participants in the younger age group (23 years and younger) ($M = 13.77, SD = 6.2$) had higher GAS scores than older age group (24 years and older) ($M = 11.56, SD = 5.5$), ($F(177) = 4.51, p < .05$).

The number of hours spent on social media also showed a significant increase from before the pandemic ($M = 15.36, SD = 12.7$) to during the pandemic ($M = 20.26, SD = 16.2$), ($t(177) = -8.87, p < .001$). Within the social media platforms, significant increments in usage were found on the following five platforms: Facebook, YouTube, WhatsApp, Instagram, and Twitter (Table 2). Significantly, more females ($M = 21.49, SD = 17.3$) spent longer hours on social media than males ($M = 14.62, SD = 8.2$) during the pandemic ($F(177) = 4.84, p < .05$). Participants in the younger age group (23 years and younger) ($M = 21.72, SD = 17.2$) spent longer time on social media than older group (24 years and older) ($M = 15.92, SD = 12.0$) on social media ($F(177) = 4.41, p < .05$).

3.2. Food consumption

Table 3 shows the frequency (i.e., times per week) of different food and beverages consumed by the participants. Paired t-test revealed a statistically significant reduction (time/week) in consumption of the food and beverage for *teh tarik*, bubble milk tea, *nasi lemak*, fried chicken, and fast food during the lockdown (Table 3). By contrast, there was a significant increase in the consumption of noodles.

Based on the ‘diagnostic’ threshold of the Modified Yales Food Addiction Scale 2.0 (mYFAS 2.0), the majority of the respondents (83.7%) did not fulfill the criteria for food addiction. Of these who fulfilled the criteria of food addiction, 4.5% ($n = 8$) of them had mild food addiction, 5.1% ($n = 9$) had moderate food addiction, and 6.7% ($n = 12$) had severe food addiction. When using the continuous scoring method, significant differences were found by gender, age groups, and residency during the lockdown. Specifically, females had significantly higher addictive-like eating behavior than males, ($F(1, 177) = 7.13, p < .01$). Participants in the younger (23 years and below) than older (24

Table 1
Sociodemographic characteristics of the respondents ($N = 178$).

	N	%	χ^2
Ethnic			
Malay	77	43.3	
Chinese	48	27.0	
Bumiputera Sarawak ⁺	35	19.7	
Other ^a	18	9.0	41.82**
Place of origin			
Sarawak	87	48.9	
Sabah	11	6.2	
Peninsular Malaysia	80	44.9	59.47**
Religion			
Islam	88	49.4	
Christian	48	27.0	
Other ^b	42	23.6	71.26**
Place of stay during the lockdown			
Residential college	32	18.0	
Staying with family	122	68.5	
Other ^c	24	13.5	99.82**

Note. ^a Indian, Bumiputera Sabah, and mixed parentage; ^b Hindu and atheists; ^c Staying out of college, intern place, staying alone; + Bumiputera means “indigenous peoples” of Malaysia; ** $p < .01$.

Table 2
Duration (in hours) spent on specific games and social media before and during COVID-related lockdown.

	Before the pandemic Mean (SD)	During the pandemic Mean (SD)	T tests
Games			
Twitch	0.67 (0.4)	0.14 (0.7)	-2.14*
Minecraft	0.09 (0.6)	0.19 (1.0)	-2.29*
Nintendo	0.07 (0.4)	0.17 (1.0)	-1.73
Candy Crash	0.35 (1.5)	0.36 (1.4)	-0.08
Mobile Legends	0.38 (1.0)	0.49 (1.3)	-1.8
Social media use			
Facebook	1.81 (2.3)	3.03 (3.6)	-7.15**
YouTube	2.87 (2.6)	4.59 (3.5)	-10.07**
WhatsApp	3.93 (4.1)	4.32 (4.8)	-2.47*
Facebook Messenger	0.38 (1.0)	0.49 (1.3)	-1.79
WeChat	0.16 (0.7)	0.27 (1.2)	-1.78
Google +	1.22 (2.5)	1.16 (2.3)	0.70
Line	0.05 (0.3)	0.03 (2.6)	0.58
Instagram	3.03 (3.5)	3.59 (4.0)	-3.83**
Skype	0.05 (0.4)	0.11 (0.5)	-2.32*
Twitter	1.54 (2.9)	2.10 (3.5)	-4.44**
Yahoo!	0.03 (0.2)	0.04 (0.2)	-0.45
Viber	0.00 (0.0)	0.01 (0.1)	-1.00
LinkedIn	0.06 (0.3)	0.09 (0.4)	-1.85
Tumblr	0.05 (0.3)	0.10 (0.8)	-1.25
Snapchat	0.19 (0.6)	0.32 (1.4)	-1.65

* $p < .05$; ** $p < .01$.

years and above) age groups ($F(1, 177) = 4.58, p < .05$), as well as those who lived outside of college compared to those who lived in a residential college or with the family ($F(1, 177) = 3.17, p < .05$) had significantly higher scores on mYFAS 2.0.

Table 3
Frequency (times per week) of different food and beverages consumption.

	Before the pandemic Mean (SD)	During the pandemic Mean (SD)	T Tests
Teh Tarik	1.12 (1.7)	0.67 (1.7)	4.34**
Carbonated drinks (e.g., Seven-up, Coke, Sprite)	1.36 (1.9)	1.51 (2.7)	-1.01
Ice cream	1.37 (1.9)	1.38 (1.7)	-0.08
Keropoks & kerepeks	2.10 (2.17)	2.12 (2.5)	-0.15
Bubble milk tea	1.19 (1.9)	0.66 (1.2)	4.14**
Nasi Lemak	1.63 (1.3)	0.81 (1.3)	2.59*
Cheese Naan	0.21 (0.7)	0.16 (0.6)	1.08
Roti canai	0.77 (1.3)	0.66(1.4)	1.37
Instant noodles	2.31 (2.0)	2.67 (2.6)	-2.14*
Curry laksa	0.45 (0.93)	0.38 (0.9)	1.10
Banana fritters/kuih	0.7 (1.3)	0.78 (1.5)	-0.63
Fried chicken	2.87 (2.4)	0.25 (2.1)	2.57*
Fast food (e.g., McDonald, Kentucky Fried Chicken, etc)	1.84 (1.9)	1.49 (1.8)	2.60*

Note: * $p < .05$; ** $p < .01$.

Table 4
Correlations between psychological responses, level of self-regulation, and addictive behaviors during the lockdown.

	Covid Fear	Psychological distress	Game addiction	Social media addiction	Eating behavior
Covid Fear					
Psychological distress	0.35**				
Game addiction	0.15*	0.36**			
Social media addiction	0.26**	0.29**	0.34**		
Eating behavior	0.26**	0.47**	0.29**	0.47**	
Self-regulation	-0.14	-0.41**	-0.29**	-0.36**	-0.32**

Note. Game addiction = Measured using Game Addiction Scale (GAS); Eating behavior = Measured using the Modified Yale Food Addiction Scale 2.0; Social media addiction = Measured using the Social Media Addiction Scale - Student Form (SMAS-SF); Self-regulation = Measured using the Short Self-regulation Questionnaire; Covid Fear = Fear of COVID-19 Scale; Psychological distress = Measured using the Kessler-6 Scale.

* $p < .05$, ** $p < .01$.

3.3. Substance use

Almost all the participants did not smoke cigarettes (96.1%) or e-cigarettes (96%) or drink any alcoholic beverages (87.6%). Four (2.2%) respondents reported a history of cannabis use, however not in the past 30 days. All of them first used cannabis when they were 16 years old or older. Among those who had consumed alcohol, 1 % had reported drinking alcohol as early as 8 or 9 years old, and 12.4 % drank at least one day in the past 30 days. Among them, 50% ($n = 11$) were Chinese and 31.8% ($n = 7$) were Bumiputera Sarawak. 14.6 % ($n = 26$) of the respondents got really drunk at least once in their lifetime and 1.1 % of them got into trouble with their family or friends, missed school, or got into fights, due to drinking alcohol.

3.4. Psychological distress

Psychological distress and anxiety towards COVID-19 showed significant differences by residency. Specifically, participants who stayed with the family during the lockdown compared to those who stayed in a residential college or outside of college had significantly higher scores on Kessler 6, ($F(1, 177) = 3.16, p < .05$), and the Fear of COVID-19 scales, ($F(1, 177) = 4.75, p < .01$). No significant differences in psychological distress were found for gender and age groups.

3.5. Correlations between addictive behaviors, self-regulation, and psychological distress during the lockdown

Table 4 shows the correlations between the three types of addictive behaviors (social media, and online gaming, and eating behavior), self-regulation, and psychological distress. There were significant positive correlations between social media addiction, online gaming, and food addiction. All these three behavioral addictions were significantly and positively associated with psychological distress, suggesting that students who had high psychological distress and feeling anxious towards

COVID-19, also reported high levels of addictive behaviors. Further analyses showed that self-regulation was negatively correlated with all the study variables.

4. Discussion

The overall aim of this study was to examine the frequency of addictive-like behaviors (i.e., eating, social media, online gaming behavior) among university students in Sarawak, Malaysia, and their associations with mental health and self-regulation. To our knowledge, this is the first study to have examined changes in the types of common and local food and beverages that the participants consumed, as well as identified common social media platforms and online gaming behaviors that students were engaged in during the lockdown for the pandemic.

In line with previous studies, time spent on online gaming and social media had increased during the lockdown period (Fernandes et al., 2020; Sun et al., 2020). In the present study, commonly used social media applications were YouTube, Facebook, Instagram, Twitter, and WhatsApp. Consistent with previous studies (Rahman et al., 2020), students tended to use Facebook and Instagram as social networking agents, while WhatsApp became the primary tool for social communication during the lockdown period. YouTube was highly used, possibly as a medium for distance learning (Kapahi et al., 2013) as the students were not able to return to the university for face-to-face teaching. The “virtual” teachers could be very eye-catching and students had more choices than sticking to just their lecturers in the classroom. Thus, having innovative devices such as smartphones and tablets with their ubiquitous nature, allowed the students to indulge themselves more in these applications.

Our result on the Gaming Addiction Scale showed that only 4.5% ($N = 8$) of the participants could be defined as monothetic gamers (i.e., “pathological gaming”). A similar prevalence rate was reported by Rahman et al. (2020) which found that students less frequently used the internet for online gaming in comparison with social media. A study by Lemmens et al. (2009) also using the 7-item Game Addiction Scale reported that 2% of Dutch adolescent gamers met the gaming addiction criteria (Lemmens et al., 2009). National surveys reported a prevalence rate ranges from 10 to 15% among youths in Asian several countries (Saunders et al., 2017). A meta-analysis on gaming disorder in Southeast Asia had reported a pooled prevalence was 10.1%, however, there was no data from Malaysia (Chia et al., 2020). Gaming disorder was not the main focus of research in Malaysia and even globally, probably due to inconsistent and different consensus among experts on the delineation of this issue with concerns of stigma and wastage of public health resources onto healthy gamers around the world (Aarseth et al., 2017).

In the present study, 16.3% of students met the food addiction criteria, with different severity levels. This finding is much higher than the prevalence of 5.0% presented in another Malaysian study (Nanthaa et al., 2016). It should be noted that our result showed a significant reduction in the intake of comfort food and beverage such as bubble milk tea, nasi lemak, and fried chicken, likely due to the lockdown measures and limited delivery services. This implied that there were potential pre-existing food addiction issues among university students even before the COVID-19 pandemic and there worth a more comprehensive study to investigate this issue.

In the Malaysian Adolescent Health Survey (MOH, 2017), the prevalence of alcohol use and tobacco use among adolescents was 10.2% and 13.8% respectively. Commonly, consuming alcohol and smoking co-occur among adolescents (Matuszka et al., 2017). E-cigarette/vaping seems to be more favored compared with conventional cigarettes. This was probably driven by the perception that vaping is less dangerous and addictive, and they could eventually successfully quit smoking (Abdul Rahman, Ganasegeran, Loon, & Rashid, 2020). As for alcohol consumption, it was probably more prevalent due to its cultural norm and more socially acceptable in specific ethnic groups (Yi et al., 2017).

Our finding showed a significant negative correlation between self-

regulation and the three addictive-like behaviors (i.e., food, social media, and online gaming), suggesting that participants with little self-control tended to have elevated addictive-like eating behavior, social media, and online gaming. Indeed previous studies had emphasized self-regulation as a key predictor in controlling emotional and addictive behaviors (LaRose et al., 2003; Van Deursen et al., 2015). Bandura (1991) illustrated the framework of the social cognitive theory of self-regulation. He believed the self-regulatory process includes “self-monitoring of one’s behavior, its determinants, and its effects; judgment of one’s behavior in relation to personal standards and environmental circumstances; and affective self-reaction.” In other words, it involves good self-control (behavior) and adequate adaptive ability to external changes be it cognition or emotion.

It is interesting to note that the score for the Fear of the COVID-19 scale is higher among those who stayed with family compared to those who stayed in the residential college or outside of college. This could be due to the longer time spent on social media while staying at home with a better internet connection during the lockdown period. The surge of rumors and misleading information might hinder people from proper social practice (Tasnim et al., 2020). This could most likely plant the seed of fears and worries especially when we were still having limited literacy about this outbreak. Social media users frequently experienced information overload as the digital transition of news spread rapidly around the globe (Bawden & Robinson, 2009). They highlighted the feeling of overload often brings the sense of losing control over situations, especially people focused to be in touch (continuous partial attention), being distractible due to overt mental stimulus (attention deficit trait), and being disruptive on top of multi-tasking (cognitive overload). Also, the media frequently sensationalize the current situation, specifically about the number of confirmed COVID-19 cases increased exponentially in a particular area, economic downturn, financial struggles, and fears of the unknown, which contributed to the depressed and powerless (Gómez-Galán et al., 2020). It is possible that having uncertainties about their tertiary studies as a result of this difficult-to-control pandemic and unprecedented university policy changes following the pandemic could also contribute to the fears and restlessness among students.

Psychological distress, measured using Kessler 6, was also significantly higher among participants who stayed with their families during the lockdown compared to those who lived in the residential college or outside of college. In a recent study done by Sundarasan et al. (2020), there were about 30% of university students with different levels of anxiety, which has been described as being caused by prolonged lockdown. In another study done on college students in China that comprised 7143 responses revealed 0.9% of respondents were experiencing severe anxiety, while 2.7% and 21.3% had moderate and mild anxiety, respectively (Cao et al., 2020). They typically experienced the so-called “cabin fever” which refers to a “combination of irritability, moodiness, boredom, depression, or feeling of dissatisfaction in response to confinement, bad weather, isolation or lack of stimulation” (Rosenblatt et al., 1984). Sundarasan et al. (2020) highlighted potential difficulties faced by the students as a result of the lockdown. Issues like poor internet connection especially when the students were expected to do online classes, unable to predict their examinations and graduation time, being socially isolated from their peers, and so forth might be overwhelming to the university students.

There is limited information about how the university students were coping with the outbreak and massive lockdown. The current study could serve as a driving force for future research with more focus on behavioral addictions in Malaysia. However, one should interpret the data carefully as the sample was limited to a small fraction of university students in Malaysia. Having a study like this would offer insight to the stakeholders such as the Ministry of Health, tertiary educational institutions, and even parents to come together and develop effective interventions to address these unspoken public health issues.

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CRediT authorship contribution statement

Ting Chuong Hock: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Project administration. **Cecilia Essau:** Conceptualization, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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