

# The impact of COVID-19 lockdown on internet use and escapism in adolescents

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## Abstract

The COVID-19 pandemic has had a significant impact on everyday functioning, considerable measures being taken to reduce the spread of the virus. Schools and social avenues have been placed on prolonged lockdowns, with people continuing to maintain physical distance. Adolescents and young people have had to endure significant stress alongside dealing with developmental characteristics. Amidst all of this, studies report an increase in gaming addiction and internet use with detrimental impact on psychosocial well-being. The aim of the present study was to examine the impact of lockdown on internet use in adolescents, comparing their habits from before the pandemic. Furthermore, this research aimed to investigate the relationship between gaming addiction, internet use and COVID-19 worries. Adolescents from several countries (e.g., India, Malaysia, Mexico and the UK) completed online questionnaires, shared via social media and youth networks. These measures included questions on internet, social media, gaming, depression, loneliness, escapism and COVID-19. Results show that adolescents generally have increased their use of social media sites and streaming services. Further, those who scored highly on gaming addiction, compulsive internet use and social media use also reported high scores of depression, loneliness, escapism, poor sleep quality and anxiety related to the pandemic. Our findings indicate that, regardless of country of residence, the COVID-19 outbreak has had a significant effect on adolescent internet use and psychosocial well-being. The need to address pandemic related distress to reduce the effect of maladaptive coping strategies is highlighted.

*Keywords: Internet use, gaming addiction, social media, depression, adolescents, COVID-19.*

## Resumen

*El impacto del confinamiento por el COVID-19 en el uso de internet y la evasión en los adolescentes.* La pandemia del COVID-19 ha tenido un impacto significativo en el funcionamiento diario, tomándose medidas importantes para reducir la propagación del virus. Las escuelas y los espacios públicos se han cerrado durante largos periodos, y la distancia física se ha impuesto. Los adolescentes y jóvenes han tenido que soportar un estrés significativo al tiempo que lidiar con las situaciones propias de su desarrollo. Los estudios informan de un aumento en la adicción al juego y al uso de Internet con un impacto perjudicial en el bienestar psicosocial. El objetivo del presente estudio fue examinar el impacto del confinamiento en el uso de Internet en los adolescentes, comparando sus hábitos con antes de la pandemia. Además, se estudia la relación entre la adicción al juego, el uso de Internet y las preocupaciones por el COVID-19. Adolescentes de varios países (India, Malasia, México y Reino Unido) completaron los cuestionarios online, que se distribuyeron a través de redes sociales y redes de jóvenes. Se incluyeron preguntas sobre Internet, redes sociales, juego, depresión, soledad, aversión y COVID-19. Los resultados muestran que los adolescentes en general han aumentado el uso de redes sociales y de servicios de transmisión. Además, los que obtuvieron puntuaciones altas en adicción al juego, uso compulsivo de Internet y uso de redes sociales también informaron de puntuaciones altas en depresión, soledad, aversión, mala calidad del sueño y ansiedad relacionada con la pandemia. Nuestros hallazgos indican que, independientemente del país de residencia, el confinamiento por COVID-19 ha tenido un efecto significativo en el uso de Internet y en el bienestar psicosocial de los adolescentes. Se destaca la necesidad de abordar el distrés relacionado con la pandemia para reducir el efecto de las estrategias de afrontamiento desadaptativas.

*Palabras clave: uso de internet, adicción al juego, redes sociales, depresión, adolescentes, COVID-19.*

In response to the COVID-19 outbreak, government in many countries have imposed a lockdown to contain the spread of COVID-

19. This lockdown involved closure of educational institutions and social establishments to limit movement. Isolation and contact

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restriction enforce a significant change to children and adolescent's daily routine and psychological well-being (Fegert et al., 2020).

The full impact of this preventative measure is yet to be known, however studies are only now beginning to highlight the consequences of this on adolescents mental health (Fegert, Vitiello, Plener, & Clemens, 2020). Hence concerns are now rising of psychological adjustment linked to increased internet usage. Studies from Wuhan (China), where the virus emerged, show that children and adolescents are therefore facing the consequences of lockdown, one of which is being sedentary (Xiang, Zhang, & Kuwahara, 2020) and engaging in problematic internet use as a method of coping and escapism (Király et al., 2020).

Even before the government imposed on the lockdown to contain the spread of COVID-19, studies have reported high use of social media and internet among adolescents (Kirkaburun & Griffiths, 2018), which are to cope with low mood and difficult thoughts as a form of escapism (Király et al., 2020). Escapism refers to a form of avoidant coping aimed at dealing with stress by escaping unsatisfying life circumstances (Henning & Voderer, 2001). Studies like this report using social media platforms such as Instagram as a form of escapism. Moreover, recent studies have shown an increase in nomophobia in Turkish youths (Durak, 2019; Gurbuz & Ozkan, 2020), which is referred to as fear of being without a mobile phone, a term coined by YouGov UK (2008, 2017) following increased reports of anxiety disorders as a result of smartphone overuse in the UK. Gao and colleagues (2017) report that escapism is linked with social media addiction. In the United States of America (US), media companies note an increase in social media, gaming and TV use (Wiederhold, 2020) and these young consumers in both the US and the United Kingdom (UK) are showing increasing concerns about current political affairs (Globalwide Index, 2020).

The affordability and ease of internet access across the globe, is associated with several health issues. Pathological use of internet, or internet addiction is shown to affect quality of sleep, with dependence on internet being significantly associated with sleep deprivation (Xanidis & Brignell, 2016). This finding is supported by a meta-analysis of studies consistently reporting that addiction to the internet is linked with sleep deprivation and further poor quality of sleep (Alimoradi et al., 2019). In particular, it appears social media addiction and gaming addiction is linked with sleep deprivation and emotional problems, such as anxiety, depression and stress (Wong et al., 2020).

Anxiety and depression is consistently linked to internet addiction, for example internet addiction in adolescents predicted social anxiety and depression, but also self-esteem (Tian, Qin, Cao, & Gao, 2020). This unhealthy internet use in adolescents is shown to increase loneliness over time (Yao & Zhong, 2014). Yao and Zhong (2014) claim that internet addiction is a mechanism to reduce loneliness, social anxiety and depression, whereby pathological internet use is manifested as a result of depression. This is supported by results showing loneliness and social media predicting internet addiction in young Indian students (Singh, Khes, KJ, Ali, & Gujar, 2020). Similarly among young Bangladeshi and Iranian students, loneliness, depression, anxiety and stress was significantly correlated with internet addiction (Mamun et al., 2020; Ostovar et al., 2016). Moreover, a recent study conducted among adolescents in Italy and the US showed that internet addiction is significantly associated with decreased low self-esteem and life satisfaction (Błachnio, Przepiorka, Benvenuti, Mazzoni, & Seidman, 2019).

More recently, findings from China during the COVID-19 pandemic reported that alongside increased pathological internet use

among adolescents, there is also an increase in alcohol and substance misuse (Sun et al., 2020). Sun and colleagues (2020) further found that the pandemic not only exacerbated symptoms of anxiety and depression but also influenced relapse from abstinence from various substances. Regardless of the pandemic, an earlier study in US shows that internet addiction and alcohol misuse is particularly prevalent among school aged adolescents (Ko et al., 2008).

These studies show that young adults are susceptible to internet addiction across different parts of the globe (Tang et al., 2017). However, the impact of COVID-19 on online behaviours and mental health is yet unclear. Gao et al. (2017) suggest that investigating such escapism from one country alone is limiting when generalising results, thus we aim to focus on the impact of social media usage in developing countries such as India, Mexico, Philippines and Malaysia where growing economies and increased smartphone usage are associated with emotional problems (Nayak, 2018; Ayandele et al., 2020). Moreover, there are reports of an increase in the use of social media to acquire further information about the pandemic, for medical advice and news (Olapegba et al., 2020). This study will therefore focus on online and smartphone use and its links to mental health among youth UK, India, Mexico, the Philippines, and Malaysia. More specifically, the current project will aim to compare addictive internet / smartphone related behaviours before and during the coronavirus pandemic.

## Method

### Participants

A total of 192 youth used the link, out of which 188 agreed to participate and continued to complete the survey. A further 3 had significantly missed completing the questionnaire, therefore the sample consisted of 185 adolescents, with a mean age 21.59 years ( $SD = 2.60$ ). The participants were from largely Mexico, India, Philippines, Malay-

Table 1. Demographic characteristics of the sample

	Frequency	%	$X^2$
Gender (% females)	121	65.76	13.37
Country of Residence			
India	38	20.65	
Indonesia	6	3.26	
Malaysia	25	13.59	
Mexico	14	7.61	
Philippines	20	10.87	
UK	40	21.74	
Unknown	41	22.28	
Education level			85.65**
School	42	22.70	
College	45	24.30	
University	75	40.76	
Other/prefer not to say	23	12.24	
Employment status			80.62**
Full - time	25	13.52	
Part - time	4	2.16	
Student	128	69.19	
Unemployed	2	1.08	
Prefer not to say/other	26	14.05	
Live with			97.11*
Family members	112	60.54	
Non-family members	73	39.46	

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

sia and the UK (Table 1). The majority of the participants were college and university students and primarily lived with their families. The results from the Chi-square statistic in table 1 shows that education, employment and living arrangements were significantly related to the country of residence.

## Instruments

Participants were asked about how often they use certain applications (apps) on their devices. These apps were grouped in categories of streaming services (e.g., Netflix, Amazon Prime), shopping apps (e.g., Wish, Amazon), social media apps (e.g., Instagram, Snapchat), gaming (e.g., Minecraft, Nintendo) and well-being (e.g., Headspace, MyFitnessPal). The use of frequency was stated in hours before and now during the pandemic (see table 4). We also asked participants questions about their concerns over coronavirus and the pandemic (see table 2). Similar to the items used by Kim et al. (2016), these were 4 items and set on a 5-point Likert scale ranging from 1 = 'never thought about it' to 5 = 'worried about it all the time'. Alongside this, the following measures were used.

The Compulsive Internet Use Scale (CIUS) (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009) was used to measure internet addiction. Internet addiction is often seen as addiction to certain online activities rather than addiction to internet itself (Meerkerk et al., 2009). This scale is made up of 14 items with a 5-point Likert scale (ranging from 0 = 'never', to 4 = 'very often'). Results from reliability analysis show strong Cronbach's alpha ( $\alpha = .91$ ) for this measure in this study.

Kessler Psychological Distress scale (K10; Kessler et al., 2002) was used to measure depression in young people. The scale which was initially developed to assess psychological distress is also considered a measure of depression (Fassaert et al., 2009). The measure which consists of 10 items is based on a 5-point Likert scale (ranging from 1 = 'a little of the time', to 5 = 'all of the time'). Strong internal reliability was found in this study for this scale ( $\alpha = .91$ ).

Social Media Use Questionnaire (SMUQ; Xanidis & Brignell, 2015) measures pathological use of social media and its impact on emotional well-being. This scale is based on 9 items set on a 5-point Likert scale (ranging from 0 = 'never', to 5 = 'always'). The internal reliability of SMUQ in this study was good ( $\alpha = .86$ ).

Escapism Scale (Gao et al.2017) was adapted to measure escapism from the real-world using internet services or apps on individual devices (see appendix). This short scale consists of four items and is based on a 4-point Likert scale (ranging from 1 = 'Strongly disagree, to 4 = 'Strongly agree'). Strong internal reliability was found in this study for this scale ( $\alpha = .92$ ).

A short-form UCLA Loneliness scale (ULS-8) was used to assess loneliness in young people. It contains the 8 items selected from the revised UCLA Loneliness Scale of Hays and DiMatteo (1987). The scale utilised a 4-point Likert scale with values ranging from 1 = 'never' to 4 = 'always'. In this study, the internal reliability of the ULS-8 was  $\alpha = .69$ .

A 7-item Game Addiction Scale (GAS; Lemmens, Valkenburg, & Peter, 2009) was used to measure gaming in adolescents. As the title suggest the scale has 7 items and is based on a 5-point Likert scale (ranging from 0 = 'never', to 5 = 'often'). In this study good internal reliability scores were found for this measure ( $\alpha = .89$ ).

A short version of the Rosenberg Self-esteem Scale was used to measure self-esteem (Lewinsohn, Hoberman, & Rosenberg, 1988). The 3 items were extracted from the original Rosenberg Self-Esteem

Scale (RSE; Rosenberg, 1965); this is the most commonly used and well-validated measure of global self-esteem. This scale is set on a 4-point scale ranging from 1 = 'strongly disagree' to 4 = 'strongly agree'. We found modest reliability scores for this measure in this study ( $\alpha = .70$ ).

## Procedure

The study was approved by Durham University's Psychology ethics committee and was carried out in accordance with the 1975 Helsinki declaration. The questionnaire was published online in Qualtrics, a platform which allows questionnaire data to be collected online using an anonymous link. Participants were recruited online and the link to complete the questionnaire was shared on various social media networks and student groups (e.g., Twitter, Facebook). All the participants voluntarily consented to completing the questionnaire; they were aware that their participation was completely anonymous as no personally identifying information was collected.

## Statistical analysis

In order to analyse the data, preliminary analyses involved looking at the descriptive statistics (including mean, standard deviations, frequencies and percentages) and the Shapiro-Wilk test of normality. The output from this shows that the data violated norms of assumption for most variables, this also was found for questions related to COVID-19 directly. Therefore, Mann Whitney U tests were used to compare mean differences between gender and age groups. Wilcoxon Signed rank test was used to measure statistical differences in internet use and well-being. Further Spearman's rho correlation tests were conducted using SPSS 27.0. A multiple regression analysis assessed the relative impact of social media use and compulsive internet use variables as predictors of escapism and other problem behaviours after controlling for age and sex.

Table 2. Mean differences (standard deviations) for COVID-19 related questions based on gender

	Overall	Female	Male	z
COVID-19 Q1	2.48 (1.12)	2.41 (1.10)	2.75 (1.16)	-1.08
COVID-19 Q2	2.63 (1.69)	2.63 (1.16)	2.75 (1.16)	-.23
COVID-19 Q3	2.99 (1.10)	2.92 (1.11)	3.21 (.98)	-.99
COVID-19 Q4	2.60 (1.16)	2.55 (1.16)	2.41 (1.10)	-.53

### Note:

COVID-19 Q1= Did you worry about being infected with COVID-19 when the first patient with COVID-19 had a definitive diagnosis?

COVID-19 Q2= Did you worry about being infected with COVID-19 when the first patient with COVID-19 died?

COVID-19 Q3= If you have not contracted coronavirus, do you worry about being infected with COVID-19 when the number of patients continued to rise?

COVID-19 Q4= Do you worry about being infected with COVID-19 even if the COVID-19 outbreak ends?

## Results

Table 2 shows the percentages of participants who reported worry related to COVID-19. The most common worry was related to being infected with COVID-19 as number of cases continued to rise compared to when the first few cases were diagnosed. There were no further differences between gender and age groups. The mean scores

show that for depression (Table 6) fall within the mild category of having depressive symptoms. Table 4 shows the difference in internet use before and during the COVID-19 pandemic. These results show that use of social media, streaming services and gaming sites and apps significantly increased during lockdown and can be further seen in Figure 1. On the contrary, sites and apps related to online shopping were significantly decreased amongst adolescents. There was no significant increase in the use of well-being sites.

Our analyses on substance use showed that during lockdown adolescents smoked significantly increased (see table 5). The number of times that adolescents consumed alcohol and other substances (including marijuana) also showed some increase during compared to before COVID-19, however this comparison did not show any significant differences.

Table 3. Mean differences (standard deviations) for COVID-19 related questions based on age groups

	Overall	16-20 years	21-25 years	z
COVID-19 Q1	2.48 (1.12)	2.59 (1.23)	2.29 (1.02)	-.78
COVID-19 Q2	2.63 (1.69)	2.59 (1.12)	2.46 (1.12)	-.50
COVID-19 Q3	2.99 (1.10)	3.06 (1.20)	2.94 (1.01)	-.29
COVID-19 Q4	2.60 (1.16)	2.94 (1.20)	2.48 (1.18)	-1.34

Note:

COVID-19 Q1= Did you worry about being infected with COVID-19 when the first patient with COVID-19 had a definitive diagnosis?

COVID-19 Q2= Did you worry about being infected with COVID-19 when the first patient with COVID-19 died?

COVID-19 Q3= If you have not contracted coronavirus, do you worry about being infected with COVID-19 when the number of patients continued to rise?

COVID-19 Q4= Do you worry about being infected with COVID-19 even if the COVID-19 outbreak ends?

Table 4. Duration (in hours) spent on specific online websites before and during COVID-19 related lockdown (N = 185)

	Before COVID-19 M(SD)	During COVID-19 M(SD)	Positive Rank	Negative Rank	z
Social media sites	5.37 (3.72)	7.81 (6.86)	17.23	10.06	-2.75*
Gaming	.73 (6.86)	1.54 (2.13)	10.00	.00	-3.87**
Streaming services	5.07 (5.54)	6.09 (5.38)	11.21	10.13	-2.61*
Shopping sites	1.08 (4.70)	.69 (1.17)	2.00	8.43	-3.30**
Well-being sites	.46 (1.16)	.53 (1.18)	4.50	9.00	-1.61

Note: \*\*p < .001; \*p < .01

Table 5 shows the correlations between internet use and well-being during lockdown. The results revealed a significant relationship between compulsive internet use, social media use and gaming addiction. These variables also showed significant positively correlation with scores of loneliness and depression. Sleep quality was significantly negatively associated with compulsive internet use, social media use, gaming addiction and loneliness. This finding suggested that adolescents who reported having a good quality sleep spent less time on internet/social media and were also feeling less lonely. Sleep quality was also negatively related to higher scores of escapism. High scores of loneliness and depression were also negatively correlated with self-esteem. An interesting finding was that worries about COVID-19 were significantly positively related to scores of compulsive internet use, social media use, gaming addiction, escapism, loneliness and depression. These results also show that high scores of COVID-related worry was significantly related to poor sleep quality in adolescents.

The next step of the analysis involved multiple linear regression, to examine the impact of COVID-19 and compulsive internet use on adolescent mood. The results from this analysis show that COVID related worries, alongside compulsive internet use, social media use and gaming addiction, together predicted scores of escapism ( $F(7,57) = 10.32, p < .001, R^2 = .59$ ), depression ( $F(5,57) = 8.89, p < .001, R^2 = .60$ ) and loneliness ( $F(7,56) = 6.18, p < .001, R^2 = .69$ ) in adolescents. More specifically gaming addiction significantly contributed further to scores of escapism ( $\beta = .47, p < .001$ ), loneliness ( $\beta = .33, p < .01$ ) and depression ( $\beta = .41, p < .01$ ). Taken together these findings highlight the increasing use of social media in the lives of adolescent, and its detrimental impact on their well-being.

Table 5. Substance use before and during lockdown (N = 185)

	Before COVID-19 M(SD)	During COVID-19 M(SD)	Positive Rank	Negative Rank	z
Alcohol use	1.20 (.47)	1.22 (.48)	11.00	13.56	-.54
Smoking/ Nicotine	1.19 (.59)	1.53 (.86)	23.70	28.50	-3.84**
Other Substances (Inc. Marijuana)	1.08 (.35)	1.13 (.48)	5.29	4.00	-1.81

Note: \*\*p < .001

## Discussion

The aim of our study was to examine the impact of COVID-19 pandemic on adolescents' online behaviours. More generally the objective was to explore differences in online habits before and since the government issued lockdown to control the spread of the coronavirus. These results show a significant increase in social media and streaming services during the pandemic. Given that adolescents usually place elevated value on peer interactions (Blakemore, 2008), there is a far greater need to maintain social connections despite the COVID-19 lockdown. They are far more susceptible to peer influence and peer expectation, which often heightens their risk taking behaviours, however these behaviours are only exacerbated in stressful times (Andrews, Foulkes, & Blakemore, 2020; Wetherill & Tapert, 2013). The results from this study showed that adolescents increased their use of social media contact across different parts of the globe, with many teens reporting use of social media (Instagram, Snapchat and TikTok) to stay in touch with their peers. This could likely help adolescents and young people stay connected and cope with the pandemic (Ellis, Dumas, & Forbes, 2020).

In line with previous studies, these findings also revealed a strong relationship between compulsive online behaviours, symptoms of depression and loneliness. For example, a study looking at psychosocial factors of internet addiction in Iran found internet addiction to be co-morbid with depression and loneliness (Mamun et al., 2020). Mamun et al. (2020) suggests that being addicted to the internet increases the likelihood of anxious and depressive symptoms. Likewise, Blachnio and colleagues (2019) reported that regardless of country of residence, addiction to the internet and social media in particular is associated with depression and lower life satisfaction. Nonetheless the coronavirus epidemic caused social isolation is more likely associated with smartphone and internet addiction, which further heightens anxiety and depressive symptoms in adolescents (Duan et al., 2020).

Our results also showed that concerns over the COVID pandemic and compulsive internet use significantly predicted high scores of

Table 6. Correlations between internet use and well-being during lockdown

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1 CIU	26.80 (3.33)	-											
2 Social media Use	12.97 (7.05)	.78**	-										
3 Gaming addiction	12.98 (6.04)	.40**	.41**	-									
4 Escapism	9.27 (3.33)	.44**	.40**	.41**	-								
5 Loneliness	18.00 (4.31)	.25*	.26**	.40**	.43**	-							
6 Depression	24.23 (8.11)	.45**	.46**	.28**	.38**	.26**	-						
7 Self - esteem	8.93 (1.87)	.03	.07	-.14	-.17	-.23**	-.21*	-					
8 Sleep quality	3.48 (1.03)	-.29**	-.21*	-.29**	-.29**	-.29**	-.14	.11	-				
9 COVID-19 Q1	2.48 (1.12)	.29*	.26*	.22*	.27*	.44	.24*	.06	-.24*	-			
10 COVID-19 Q2	2.63 (1.69)	.33**	.32**	.26*	.34**	.08	.29**	-.02	-.18	.84**	-		
11 COVID-19 Q3	2.99 (1.10)	.38**	.34**	.32**	.40**	.22*	.48**	-.07	-.36**	.56**	.65**	-	
12 COVID-19 Q4	2.60 (1.16)	.39**	.29**	.19	.40**	.30**	.40	-.14	-.29**	.52**	.61**	.71**	-

Note. \*\* $p < .001$ ; \* $p < .05$ ; CIU = Compulsive Internet Use

COVID-19 Q1= Did you worry about being infected with COVID-19 when the first patient with COVID-19 had a definitive diagnosis?

COVID-19 Q2= Did you worry about being infected with COVID-19 when the first patient with COVID-19 died?

COVID-19 Q3= If you have not contracted coronavirus, do you worry about being infected with COVID-19 when the number of patients continued to rise?

COVID-19 Q4= Do you worry about being infected with COVID-19 even if the COVID-19 outbreak ends?

depression, loneliness and escapism. The average scores of depression suggests that adolescents are experiencing mild symptoms which maybe directly linked with the lockdown (Király et al., 2020), in combination with increased internet and social media use. According to Duan et al. (2020) adolescents in Hubei province of China, where the population experienced the first outbreak of COVID-19, adolescent depressive symptoms were directly linked with anxiety which stems from fear of outbreak and fear of infection. This offers further support to our finding of COVID-19 worries strongly correlating with symptoms of depression.

Furthermore, high scores of gaming addiction also contributed towards escapism, loneliness, and symptoms of depression. Supporting the findings of Wong et al. (2020), these results suggest that increased use of internet gaming is linked with poor psychological adjustment, and also quality of sleep. Increase in gaming has been observed in Europe and the United States of America, with adolescents using this to cope with the psychological distress of the pandemic (Ko & Yen, 2020). Escapism is closely correlated with gaming addiction, which suggests that escapism acts as a coping mechanism for gaming behaviour (Yee, 2006) and something that may further relieve stress for a short period (Balhara, Kattula, Singh, Chukkali, & Bhargava, 2020); this may be relevant particularly during the COVID-19 pandemic (Király et al., 2020).

Despite highlighting some important findings regarding the implication of pandemic on internet use, this study does have limitations. Firstly, the response rate for completing the questionnaire was lower than expected, with delays in completing the questionnaire. There could be several reasons for this, including difficulties gaining access to individuals from this age group. However, according to Wright (2005) invitation emails to participate in the study may be rejected if the site is not trusted by participants, with researchers significantly experiencing this. Secondly, as the study did not assess any pre-existing conditions within the adolescent participants, considering the pandemic, the impact of this needs to be examined further and should be considered in future studies. In particular, gaming and internet addictions which may exacerbate during times of increased

distress (Ko & Yen, 2020). Studies show that peer interaction is highly valued amongst adolescents (Andrews et al., 2020), particularly when considering their engagement with online activities and social media to maintain interaction (Ellis et al., 2020). Finally, this study did not examine peer relationships specifically, considering this alongside internet and gaming addiction could provide a glimpse into the relationship between these two factors. The COVID-19 pandemic may have a significant impact on adolescent wellbeing and internet use; however, these behaviours may impact further by their evolving relationship with their peers.

To conclude, the main objective of this study was to examine the impact of COVID-19 lockdown on online behaviours and how this may have changed from before the pandemic in adolescents. As adolescents have been susceptible to internet addiction before lockdown was reported (Ko et al., 2008), we wanted to examine whether the pandemic would have a detrimental effect on this. Further we wanted to explore the relationship between these online behaviours and psychological well-being. Given the ongoing pandemic, these findings revealed a greater increase in social media use and streaming services. Moreover, these results showed that compulsive internet use and increased social media use was strongly associated with worries of COVID-19 and symptoms of depression. Those scoring high on gaming addiction also reported increased symptoms of depression, loneliness and escapism. Taken together these results highlight that adolescents who rely on maladaptive coping strategies, such as gaming and compulsive use internet, to manage distress and anxiety are likely to have a negative effect on their mental health and even quality of sleep.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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