

# The Effect of Internet Addiction on Well-Being among University Students in Hong Kong

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## Abstract

This paper aims to enrich the public understanding of multiple factors that lead to Internet addiction by investigating the impact of Internet Addiction on the well-being of university students, with a particular focus on the roles of parental strain, study strain, and self-identity. The research framework is grounded in the Conservation of Resources (COR) theory. A sample of 74 university students from Hong Kong was analyzed to test the proposed model. The findings indicate that both parental strain and study strain are positively associated with Internet Addiction. Moreover, parental strain was found to have a significant negative correlation with students' well-being, and resources can significantly predict well-being. These results underscore the complex interplay between parental strain, study strain, Internet Addiction, and the well-being of university students.

## Keywords

Conservation of Resources (COR) Theory, Parental Strain, Study Strain, Self-Identity, Resources, Well-Being

## 1. Introduction

With technological advancements, the Internet has made our lives easier and become a daily necessity for us. According to the data provided by the Census and Statistics Department of Hong Kong (Census and Statistics Department, 2023), in 2022, among all the households in Hong Kong, 96.1% of them have access to the Internet at home, and most people use the Internet for searching information (100%), communication or interaction (99.2%) and online entertainment (94.6%). Besides, it was also found that people spend about 6.5 hours online every day, which shows the prevalence of Internet use in Hong Kong. Indeed, the Internet is beneficial to our daily life, since it enables us to connect with friends and

family through different social media platforms without being restricted by geographical constraints. However, when the Internet plays a prominent role in our lives, the concern of Internet Addiction has also been raised. This phenomenon has been investigated by the American Psychiatric Association (APA), they further conceptualized “Internet Gaming Disorder” in the DSM-5 and confirmed to have different consequences on adolescents (APA, 2013). It was found to be more prevalent among male adolescents in Asian countries, such as China and South Korea (Liao et al., 2022). Meanwhile, the prevalence of Internet Addiction in Hong Kong SAR increased from 3.0% to around 27% in the past decade, which implies one in every five students has Internet Addiction (The Department of Health, 2018). Compared with other countries like Europe and the United States, the prevalence of Internet Addiction in Hong Kong SAR is relatively high (Chung et al., 2019). The Office of the Communication Authority (2018) claimed that the prevalence of Internet Addiction in Hong Kong SAR is the highest in the world. With different research on this topic, the overall situation has not improved or even worsened.

One of the reasons for this is that the concept of Internet addiction is far more complex than the public has been aware of. Internet Addiction could be considered as a sum of multiple problematic Internet usage, which includes social media addiction, smartphone addiction, and Internet gaming disorder. Several research gaps could be observed. Research in the past mainly focused on examining the phenomenon in the secondary school environment. Also, a comprehensive analysis of multiple causes that lead to Internet Addiction and further harm one’s well-being is lacking. Therefore, this study will examine the relationship between Internet Addiction and adolescents’ well-being in the university environment by applying the Conservation of Resources (COR) theory.

## 2. Literature Review

### 2.1. Definition

In understanding Internet Addiction, first, the definition must be identified. Although the very first definition contributed by APA (2013) has provided insights for many scholars, the definition of Internet Gaming Disorder is not the same as Internet Addiction. Internet Gaming Disorder is more like a subtype of Internet Addiction. Internet Addiction is described by Shaw and Black (2008) as “excessive or poorly controlled preoccupations, urges or behaviors regarding computer use and Internet access that lead to impairment or distress”. Griffiths (1998) viewed Internet Addiction as a subset of behavioral addictions, encompassing technological and computer addiction. Additionally, Kandell (1998) depicted Internet Addiction as “a psychological dependence on the Internet, regardless of the type of activity once logged on”. While these definitions emphasize different aspects—behavioral patterns, broader categorizations, and psychological dependence—they collectively provide a comprehensive understanding of Internet Addiction. Despite variations in their definitions, scholars generally agree on the core aspects of Internet Addiction. It involves a compulsive need to use the Internet,

leading to significant impairment or distress in daily life. This common understanding helps frame the discussion and research around Internet Addiction, facilitating better identification, prevention, and intervention strategies.

## 2.2. Causes

Of all the different causes that lead to Internet Addiction, there is no dominant factor found. Scholars studying Internet Addiction and its prevention programs usually discuss the issues in 3 domains: community, family, and school.

At the community level, when teenagers fail to build their self-identity in reality, they may turn to the Internet (Crews et al., 2007). The phenomenon may be related to sexual and ethnic minorities. Teenagers in puberty are eager to form relationships and gain acceptance from others to build a sense of belonging, but these minorities may have difficulties searching for homogeneity from others. The Internet provided a ground for them to know themselves through people with similar identity concerns. By using the Internet, they can interact with other people and share opinions, such as people of color sharing their experiences of being bullied, which helps to generate homogeneity. Those who are extremely shy or have social problems are also at high risk. They find it difficult to relate to their peers, and then they may rely on the Internet to meet this demand since they are not receiving enough emotional support in their real life.

At the family level, family stress is a common factor. Adolescents may suffer from family quarrels and family conflict, and want to escape from them (Lau et al., 2017). Also, parent divorce, impaired family relationships, and family history of Internet Addiction are reported as risk factors that can positively increase the likelihood of Internet Addiction. In addition, Leung and Lee (2012) reported that adolescents from low-income families have a higher possibility of being addicted to the Internet since they consider the Internet as a cheap and convenient entertainment tool.

At the school level, academic stress and a lack of sense of belonging in school are associated with Internet Addiction (Cheung et al., 2018). Scholars (Lavoie & Pychyl, 2001; Velezmoro et al., 2010) reported that there is a strong association between academic stress and Internet Addiction. Jun and Choi (2015) further indicated that academic stress will specifically lead to Internet Gaming Disorder, in which adolescents play games to relax but eventually become addicted to video games. Teenagers may find online gaming more alluring than offline pursuits, which could result in ignoring their commitments and experiencing a general deterioration in well-being (Kurniasanti et al., 2019). In addition, some scholars (Bernardi & Pallanti, 2009; Schraml et al., 2011; Spada et al., 2008; Wilks, 2008) pointed out that negative emotions, such as depression and anxiety, are also associated with academic stress and Internet Addiction. Students looking for academic achievement are usually found with serious depression symptoms (Kim & Park, 2013). Jun and Choi (2015) further stated that the high suicide rate is also related to it.

### 2.3. Consequences

The consequences of Internet Addiction have also been broadly discussed; however, no systemic categorization has been produced. This paper classifies consequences into two aspects, namely physical and mental related problems.

For physical health, the main issue is prolonged passive activity, which raises the risk of obesity, interferes with sleep cycles, and leads to musculoskeletal problems. Reduced physical activity and disturbed sleep have a detrimental effect on general well-being. The addictive online behaviors and sedentary lifestyles that accompany Internet Addiction pose a double threat to the health of adolescents, underscoring the urgent need for interventions to lessen these adverse health outcomes (Kurniasanti et al., 2019). Mylona et al. (2020) further reported that blurred vision at close range and dry eye syndrome are consequences of overusing the Internet. In addition, Kim et al. (2009a) discovered that some adolescents may skip meals while using the Internet.

On the other hand, scholars (Davis, 2001; Kim et al., 2009b; Schmit et al., 2011) have found that Internet Addiction may also lead to psychological effects, such as depression, anxiety, and low self-esteem. Adolescents' mental health issues are worsened by the pressure to live up to the excessive expectations mentioned above. These will aggregate their performance in different aspects, such as at the family level, their family relationship will be worsened since adolescents may focus on the virtual world and refuse to communicate with their parents (The Department of Health, 2018).

The causes and the effects of Internet Addiction are often interrelated, which means that some factors could be both the causes and the effects. For instance, it was found that students who experienced loneliness are more likely to spend more time on the Internet. At the same time, Internet Addiction could also lead to loneliness among young people. Adolescents with Internet Addiction are often immersed in the virtual world that they do not find the real world interesting, which gradually makes them isolated from the real world and decreases their real-life social interactions (Young & Abreu, 2011). They may use the Internet as a coping strategy to avoid face-to-face interactions or escape their real-life problems, such as low academic achievement and family conflict. However, Internet Addiction can lead to loneliness if the Internet has become a mental shelter for adolescents to substitute for reality. It will eventually become a vicious cycle that could only worsen the situation (Kim et al., 2009a).

### 3. Theoretical Framework

The Conservation of Resources (COR) theory was applied in this study to interpret the relationship between Internet Addiction and well-being. COR theory emphasizes several concepts, including resource gain, resource loss, and stress. Hobfoll et al. (1986) believed that stress happens in three situations, including "there was a threat of a loss of resources", "an actual loss of resources", and "a lack of gained resources following the spending of resources". And, resources, as

a tool to handle stress, are not limited to physical ones, but also mental ones, such as family support. Since COR theory has a vague definition of resources, this study identified resources that could be a sense of achievement, academic support, family support, and self-identity (ethnic identity and sexual identity). All these can help to develop mental resilience to handle stress. Not being able to maintain these resources is a “resource loss”, which would further generate stress.

COR theory also gains its ground with its unique explanation of “stress interaction”. The theory states that losing a resource is harmful and cannot be fully recovered by gaining a new resource (Hobfoll et al., 2018). This is because losing resources can also cause new stress to individuals. Given that resources can be aforementioned examples, such as family and peer support, some stressful life events can directly become the stressor, for example, parental divorce and friends passing away, in which individual may lose their support from others. Individuals have to face the impact of resource loss and stressful life events. A stressful life event can interact with another stressor, such as academic failure, to create a double impact. People trapped in the stress cycle need double resources to deal with two issues. And resource gain depends on resource expenditure, resource expenditure means one must expend their resource, as an investment, to seek more resources. Sometimes, resource expenditure may have a successful result, but sometimes it does not pay off. Also, resource gain needs time to develop, which means they cannot solve the problem in the short term (Hobfoll et al., 2018). The cycle of stress is a possible explanation for the interrelationship mentioned above between causes and effects. This explanation is hard to replace with other theories. Therefore, this paper believes that the COR theory provides a different perspective on understanding Internet-addicted youth and their well-being.

Figure 1 shows the correlation between variables and further hints at the hypothesis of this study. Multiple stressors, namely study strain, parental strain, and self-identity concern would force one to use their resources to handle them. When resources are depleted, the Internet may be one’s escapism, which may further affect one’s well-being. The hypotheses of this study are as follows:

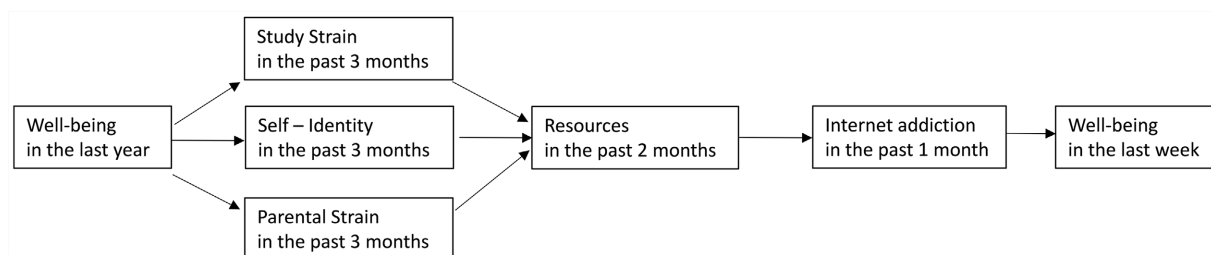


Figure 1. Theoretical framework.

Hypothesis 1: Internet Addiction has a negative effect on well-being.

Hypothesis 2: High parental strain has a positive effect on Internet Addiction.

Hypothesis 3: High study strain has a positive effect on Internet Addiction.

Hypothesis 4: Low self-identity has a positive effect on Internet Addiction.

Hypothesis 5: Resource has a positive effect on well-being.

## 4. Methodology

### 4.1. Sampling

This paper targets university students in Hong Kong. The sample size would be around 100. For the data collection method, this study used a self-administered questionnaire survey. The data collection ran from February 2024 to April 2024. All methods were carried out in accordance with relevant guidelines and regulations. All experimental protocols were approved by the Department of Social and Behavioural Sciences of the City University of Hong Kong. Informed consent was obtained.

### 4.2. Measures

#### *Internet Addiction*

This study adopted the Chen Internet Addiction Scale (CIAS) (Chen et al., 2003). Participants rated their feelings in the past 1 month from 0 to 4. The internal reliability was 0.79 (Cheung et al., 2018).

#### *Resource*

The Conservation of Resources Evaluation Questionnaire (COR-E) was applied to measure participants' resources. Because the original COR-E consists of 74 items, some of which are not the focus of this topic, it was modified into 14 items. Participants rated their feelings in the past 2 months from 0 to 4. Questions, such as "Feeling that I am successful" and "Sense of pride in myself" were asked. The internal reliability of modified COR-E is .85 in this study.

#### *Parental Strain*

Jang et al. (2014)'s Parental Strain Scale was applied to measure participants' parental strain. Participants rated their feelings in the past 3 months from 0 to 4. Questions such as "I get stressed by disputes with parents" were asked. The internal reliability was .86 (Wang & Jiang, 2021).

#### *Study Strain*

Jang et al. (2014)'s Study Strain Scale was applied to measure participants' study strain. Participants rated their feelings in the past 3 months from 0 to 4. Questions such as "I get stressed by poor school grades" were asked. The internal reliability was .85 (Wang & Jiang, 2021).

#### *Self-identity*

The Social and Personal Identities Scale was applied to measure participants' self-identity. Since the questions of the personal identity subscale are not the focus of the study, this study only applied the social identity subscale and modified it from 16 to 5 items. Participants rated their feelings in the past 3 months from 0 to 4. Questions such as "my gender group" were asked. The internal reliability of the modified social identity subscale is .76 in this study.

### *Well-being*

The Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) was applied to measure participants' well-being. The scale was modified from its original version, the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS). Participants rated their feelings in the recent week and last year from 0 to 4. Questions such as "I've been feeling useful" were asked. The internal reliability was .92 (Fung, 2019).

### 4.3. Statistical Analysis

SPSS was applied in this study to analyze the data. Correlation analyses were performed to examine the hypothesis. Multiple linear regression methods were performed to identify predictors of well-being. Age and gender were entered in time 1, well-being in last year, self-identity, parental strain, and study strain were entered in time 2, resources were entered in time 3, and Internet Addiction was entered in time 4.

## 5. Result

### 5.1. Demographic Respondents

There were 74 surveys returned in this research. **Table 1** demonstrates the demographic background of participants. More than half of the respondents are female (60.8%). The ages of participants are mostly around 18 - 21, which fits the sample targeted university students. Most of the respondents are Asian (98.6%).

**Table 1.** Sociodemographic characteristics of participants at baseline.

Baseline characteristic	<i>n</i> = 74	%
Gender		
Female	45	60.8
Male	29	39.2
Age (years)		
18	13	17.6
19	13	17.6
20	9	12.2
21	18	24.3
Others	21	28.3
Ethnicity		
Asian	73	98.6
Black	1	1.4

### 5.2. Correlations

**Table 2** demonstrates the correlations between each variable. Well-being in last year was positively correlated with well-being in last week ( $r = .790, p < .01$ ), self-identity ( $r = .296, p < .05$ ), and resources ( $r = .429, p < .01$ ). Well-being in

last week was positively correlated with self-identity ( $r = .475, p < .01$ ) and resources ( $r = .518, p < .01$ ), and negatively correlated with study strain ( $r = -.277, p < .05$ ) and parental strain ( $r = -.243, p < .05$ ). Self-identity was positively correlated with resources ( $r = .370, p < .01$ ). Study strain was positively correlated with parental strain ( $r = .362, p < .01$ ) and Internet Addiction ( $r = .281, p < .05$ ) and negatively correlated with resources ( $r = -.280, p < .05$ ). Finally, parental strain is positively correlated with Internet Addiction ( $r = .346, p < .01$ ). The remaining variables are not significant.

**Table 2.** Correlations for study variables.

Variable	1	2	3	4	5	6	7
1. Well-being in last year	—						
2. Well-being in last week	.790**	—					
3. Self-identity	.296*	.475**	—				
4. Study strain	-.173	-.277*	-.137	—			
5. Parental strain	-.217	-.243*	-.039	.362**	—		
6. Resource	.429**	.518**	.370**	-.280*	-.049	—	
7. Internet addiction	-.200	-.206	-.082	.281*	.346**	.131	—

Note: \*\* $p < .01$  level, \* $p < .05$  level.

### 5.3. Regression

Multiple linear regression analyses were performed to identify predictors of well-being in last week. **Table 3** demonstrates the results of four multiple linear regression analyses.

#### *Model 1: Well-being in last week regressed on age and gender*

Age did not significantly predict well-being in last week,  $\beta = .084, t = .530, p = .60$ . Gender (female = 1) also did not significantly predict well-being in last week,  $\beta = .058, t = .531, p = .60$ .

#### *Model 2: Well-being in last week regressed on well-being in last year, parental strain, study strain, and self-identity*

Well-being in last year significantly predicted well-being in last week,  $\beta = .686, t = 9.738, p < .001$ . Self-identity also significantly predicted well-being in last week,  $\beta = .256, t = 3.712, p < .001$ . Parental strain did not significantly predict well-being in last week,  $\beta = -.046, t = -.646, p = .52$ . Study strain also did not significantly predict well-being in last week,  $\beta = -.106, t = -.1496, p = .14$ .

#### *Model 3: Well-being in last week regressed on resources*

Resources significantly predicted well-being in last week,  $\beta = .518, t = 5.140, p < .001$ .

#### *Model 4: Well-being in last week regressed on Internet Addiction*

Internet Addiction did not significantly predict well-being in last week,  $\beta = -.206, t = -1.787, p = .08$ .



**Table 3.** Predictors of well-being in last week.

	B	SE	$\beta$	t	Sig.
Model 1					
Age	.303	.573	.084	.530	.598
Gender	.654	1.230	.058	.531	.597
Model 2					
Well-being in last year	.537	.055	.686***	9.738	<.001
Parental strain	-.078	.120	-.046	-.646	.520
Study strain	-.195	.130	-.106	-.1496	.139
Self-identity	.379	.102	.256***	3.712	<.001
Model 3					
Resources	.344	.067	.518***	5.140	<.001
Model 4					
Internet addiction	-.291	.163	-.206	-1.787	.078

Note: \*\*\* $p < .001$  level.

## 6. Discussion

This paper investigates the effect of Internet Addiction on well-being among university students in Hong Kong. Internet Addiction is a complex issue that involves multiple factors. Different causes can lead to different subtypes of Internet Addiction. The explanation of females addicted to the Internet shall be different from males. Females are more likely to be addicted to social media, whereas males are more likely to be addicted to Internet gaming.

### 6.1. The Correlation between Parental Strain, Internet Addiction, and Well-Being among Females

The present study shows that well-being is positively correlated with gender, but negatively correlated with Internet Addiction, which implies well-being among female university students is affected by Internet Addiction. One of the possible explanations is related to the concept of body dissatisfaction. It is reported that body dissatisfaction is strongly associated with eating disorders (Stice & Whitten-ton, 2002), which can lead to serious physical consequences, such as gastrointestinal diseases and Cardiovascular complications. As for mental effects, it is pointed out that depression symptoms are often related to eating disorders (Stice et al., 2000). These all indicate that one's well-being can be influenced by eating disorders that are generated by body dissatisfaction.

The relationship between body dissatisfaction and well-being can further be explained by Internet Addiction. With the rapid development of the Internet, researchers found that body dissatisfaction less appeared in traditional forms of media but has developed in the virtual world. Compared with males, females are more frequently engaging in body image comparisons with others (Leahey et al.,

2007). Young women with body image concerns tend to spend more time on social media (Yurdagül et al., 2021). As a result, they may be addicted to the Internet since they actively compare themselves with others, and their anxiety about their body image will result in eating disorders, which further harm their well-being.

Parental strain could be one of the main causes of body dissatisfaction among adolescents. Although as mentioned before, the media is the main source leading to adolescents' concern about their body image, there are other stressors. Adolescents can perceive pressures in multiple ways, such as from friends, dating partners, and family. Stice and Whitenton (2002) explained that parents urging their daughters to diet is a common example of parental strain causing adolescents' body dissatisfaction, which aligns with the results of the present study—parental strain is significantly negatively correlated with well-being in last week. On the other hand, the present study shows that resources can significantly predict well-being. If a girl receives adequate parental support, she may have greater body satisfaction (Barker & Galambos, 2003). These findings may shed light on the correlation between parental strain, Internet Addiction, parental support, and well-being among females.

## **6.2. The Correlation between Study Strain, Internet Addiction, and Well-Being among Males**

On the other hand, the well-being of male university students is also negatively affected by Internet Addiction. Males tend to use the Internet as entertainment to relieve themselves from stress. She et al. (2021) discovered that Hong Kong males had a higher prevalence of Internet Gaming Disorder than females, which aligns with others' findings (Hankin et al., 2007; Wu et al., 2016). Chung et al. (2019) indicated that males play online games, namely battle royale games, more than females. These games involve competitive elements, in which the game atmosphere urges players to find ways to improve themselves. The rewards or successes can be shared immediately with others through social media. These elements contribute to stimulating males' masculine gaming behavior and developing their sense of achievement, which further motivates them to play the games continually. Succeeding in games can further bring admiration and respect from other players, which in turn strengthens their sense of achievement and gives more motivation to them to divide into the virtual world. As a result, Internet Gaming Disorder would be developed among them if they are addicted to online games.

Playing online games not only provides a sense of achievement but also relieves adolescents from study strain. Gu and Mao (2023) examined the relationship between academic stress and Internet Gaming Disorder in the post-pandemic era in China, they pointed out that university students in China have to put extra effort into dealing with examinations after a long period of school closure. Also, the increased graduation requirement puts pressure on these university students. Therefore, an increasing phenomenon of Internet Gaming Disorder has been observed in China, in which university students escape from the high level of

academic stress through playing online games. This finding can explain the results of the present study—study strain is significantly negatively correlated with well-being in last week, but significantly positively correlated with Internet Addiction.

However, the effect of playing online games on one's well-being may be arguable. [She et al. \(2021\)](#) stated that playing online games may have positive effects on one's well-being since it can reduce academic stress. Other positive effects, such as increasing one's social capital, reducing one's loneliness level, and developing one's communication skills, have been reported ([Raith et al., 2021](#)), which reflect playing online games can also bring benefits. The key point of whether playing online games is negative or not depends on whether one is addicted to it or not, which implies one's self-control determines whether the effect of playing online games is positive or negative on one's well-being. If one tries to relieve their stress by playing games, then the effect shall be positive; but if one tries to escape from reality by playing games for a long period, then the effect shall be negative. As most of the variables discussed in this paper, things can be resources to cope with stress if one manages them well, but can aggravate the problem if one does not manage them well.

### 6.3. General Discussion—Internet Addiction in the Post-Pandemic Era

The most important findings of this paper are parental strain and study strain positively related to Internet Addiction. The results align with others' findings ([Jun & Choi, 2015](#); [Suh & Lee, 2007](#)). Previous studies on Internet Addiction mainly focused on examining the prevalence of Internet Addiction among secondary school students. A related follow-up investigation on the university students is lacking. The results of this paper show that the parental strain and study strain that lead to Internet Addiction can also affect university students' well-being.

As aforementioned, the COVID-19 pandemic also affected the situation. The stress interaction concept and the resources loss spiral concept in COR theory can be applied to explain how two strains react with each other and create a stress cycle. [She et al. \(2021\)](#) explored the relationship between COVID-19 stress and Internet Gaming Disorder with COR theory, they argued that the COVID-19 pandemic is a huge threat to individuals' resources, which causes resource depletion among adolescents. At the same time, the COVID-19 stress also generated parental strain and study strain on adolescents.

At the school level, school closure has a notable effect on adolescents' interactions with both peers and teachers, leading to a decrease in social support ([Duan et al., 2020](#)). School closure can further affect their family since it brings substantial changes, including changes in household responsibilities, increased caregiver stress, and the need to redefine rules regarding home confinement ([Prime et al., 2020](#)). These disruptions have potentially heightened family tension and generated interparental conflicts. The COVID-19 stress experienced by parents may further trickle down to their children, which implies the chain effect of COVID-19

stress not only depleted their parental support but also generated their parental strain. As a result, displaced aggression may happen within the family, which can further harm one's well-being. Furthermore, restricted access to academic resources, such as closed libraries and limited support from teachers, coupled with challenges in online teaching, may significantly elevate students' academic stress levels. It is reported that 29% of university students were not satisfied with online learning during the COVID-19 pandemic (Lingnan University, 2020). Moawad (2020) also indicated that the uncertainties regarding exams and the dates of assessments increased students' study strain. When Hong Kong has a relatively stressful academic atmosphere, an absence of academic support, as a resource loss, is harmful to these university students. Additionally, numerous studies (Jeong et al., 2019; Schraml et al., 2011; Plante et al., 2018) conducted before the COVID-19 outbreak have demonstrated that academic stress and lack of social support are significant risk factors for depression and Internet Gaming Disorder among adolescents. Therefore, it is believed that stress related to schooling and online learning is correlated with heightened academic stress and reduced social support, consequently increasing the risk of depression and Internet Gaming Disorder among adolescents.

In understanding why the Internet is adolescents' escapism, the COR theory would be a good entry point. Given that students not only lost academic support and parental support during the pandemic but also needed to face study strain and parental strain, their stress levels were doubled. When COR theory suggests resource loss cannot be recovered in the short term since resource gain takes time to develop, adolescents may feel it is difficult to find a new resource to solve the problem, which further generates negative emotions, such as anxiety and depression that would damage their mental. Once they lose these resources, they may adopt a more negative coping strategy to deal with the issues. And as aforementioned, the Internet provided a shelter for adolescents to escape from reality. If they overuse the Internet, Internet Addiction symptoms will be discovered among them.

#### **6.4. Parenting Style and Parental Strain**

Another explanation for parental strain leading to Internet Addiction would be related to parenting styles. Among different types of parenting styles, Huang et al. (2010) reported that rejecting, neglectful, and overprotective parenting styles are associated with Internet Addiction. Sun and Wilkinson (2020) explained that rejecting parenting style involves refusing to affirm their children's achievement, a neglectful parenting style involves not fulfilling the needs of their children, and an overprotective parenting style involves too much protection for their children, these are all harmful to the relationship between the parents and the children or the children's personal development. As a result, children with these parenting styles would have a higher chance of being addicted to the Internet. In addition, authoritarian parenting is also discussed. It is argued that since authoritarian parents establish their authority through restriction and punishment on

children, children with such parents usually have high levels of depression. However, children with adequate parental support are less likely to be addicted to the Internet (Siomos et al., 2012), which implies that parental strain is only related to several types of parenting styles. While parenting style can have a long-term effect on children's personal development, it is possible to affect children throughout their entire puberty and young adulthood, which may also help explain how improper parenting style could slowly develop parental strain on adolescents.

### 6.5. Self-Identity and Self-Identity Confusion

The present study also shows that self-identity can significantly predict one's well-being, which aligns with Hsieh et al.'s (2019) finding. However, self-identity is negatively correlated with Internet Addiction, which is different from others' findings. The inconsistent results can be explained by the concept itself. The concept of self-identity can be divided into two types, normative and diffuse-avoidant. The former refers to a relatively stable, confirmed self-identity which can work as a protective factor against Internet Addiction, whereas the latter involves self-identity confusion, which is positively correlated with Internet Addiction. Some of the research on self-identity-related topics confused these two concepts or simply mixed up these two into one, which further caused results inconsistent findings. This paper, as stated in the theoretical framework, considers self-identity as a resource; therefore, self-identity should reduce the risk of Internet Addiction.

Regarding self-identity confusion, scholars (Israelashvili et al., 2012; Mazalin & Moore, 2004) indicated that the Internet not only provides grounds for adolescents to share their self-identity concerns but also works as their escapism to not facing the difficulties in reality, such as racial discrimination. They may find peer support from others on the Internet since adolescents may discuss similar concerns on forums. Making discussion is healthy, but overusing the Internet to express ideas and being addicted to the Internet eventually would harm one's well-being.

However, the participants of this study mainly consist of Asians and the gender binary, which does not explore the part that the literature review mentioned, which is ethnic and sexual minorities may have difficulties searching for homogeneity from others. Although the result reflects the positive correlation between self-identity and well-being, a limitation, the lack of ethnic and gender diversity in this study, must be pointed out here. Future research shall explore the effect of Internet Addiction on ethnic and sexual minorities' well-being.

## 7. Implication

The current measures in handling Internet Addiction have much room to improve. The actions done by the government or NGOs are usually outreach promotional services, anti-Internet Addiction programs, hotline services, and consultations. The effectiveness of these approaches is questionable since the preva-

lence of Internet Addiction increased in the past decade. One of the possible explanations is that these approaches are not proactive. Taking action before youths addicted to the Internet would be more effective (Jun & Choi, 2015). Most programs targeting Internet Addiction serve the purpose of raising awareness rather than proactively intervening. Youths obsessing with the Internet may not have the impetus to seek help and even isolate themselves from the community, which caused these programs not to truly target these addicts. Also, the fact that most NGOs receive funding from charity donations destabilizes their services in terms of availability and quality since funding can be suspended at any time. The discontinuation of the P.A.T.H.S. program (Busiol & Lee, 2015) is an example. The P.A.T.H. program was a longitudinal study that focused on Internet Addiction among secondary school students that suspended in recent years. After that, no other local study kept tracking the phenomenon. To tackle the high prevalence of Internet Addiction in Hong Kong, this paper suggests the Department of Health should include screening for Internet Addiction. CIAS can be used as a questionnaire to identify potential Internet-addicted students. Once the Internet Addiction symptoms are identified, the student should be referred to suitable services. Through this measure, addicted youths can be identified in an early phase and receive services not until the problem becomes serious.

Another issue that could be observed is the lack of follow-up research. The failure to keep track of the prevalence of Internet Addiction and delineate which factor is precisely the main cause of such problems that adversely influence the device of effective strategies. Although this paper has categorized factors into 3 domains, what must be admitted is that the categorization in this paper may not be the best way to understand the issue fully, since other factors, such as social media influence and online gaming (Cheung et al., 2018), are not examined in this paper. To remedy this flaw, a suggestion is proposed here that the government can take the initiative in conducting mass data collection every year to normalize longitudinal studies. Surveys can be administered in sync with the outreach activities mentioned above and become part of the educational material. Official research papers should be published regularly to ensure the persistent monitoring of local situations and the effectiveness of services for the reference of policymakers and service providers. The public awareness will also be strengthened.

In terms of prevention, South Korean scholars, Jun and Choi (2015), suggested sports activities as an alternative entertainment to prevent adolescents addicted to the Internet. They discussed academic stress as the main cause of Internet Addiction and further argued that Korean teenagers allocate their time to studying, thus lacking sufficient leisure opportunities, which causes establishing a unique leisure culture and fostering leisure activities for Korean adolescents to become challenging. In their study, they found that adolescents who engaged in sports activities or who had multiple hobbies were more likely to have low levels of academic stress, which implies sports activities are a possible solution to prevent Internet Addiction. In other words, the absence of interest in sports activi-

ties may lead adolescents to divide into the virtual world more frequently. Future research can investigate the effectiveness of sports activities in reducing adolescents' level of Internet Addiction and as a support to implement related action into education policy, such as more P.E. lessons at primary and secondary levels of education.

## 8. Limitations

One significant limitation of this study is the small sample size. With only 74 university students from Hong Kong participating, the generalizability of the findings is limited. A larger sample size would provide more robust and reliable results, offering a more comprehensive understanding of the effects of Internet Addiction on university students' well-being. The small sample size also increases the margin of error and may not adequately capture the diversity of the student population, including variations in background, socioeconomic status, and academic disciplines. Furthermore, the limited sample size restricts the ability to perform more complex statistical analyses, such as structural equation modeling or multi-group comparisons, which could provide deeper insights into the relationships between parental strain, study strain, self-identity, and Internet Addiction. Future research should aim to include a larger, more diverse sample to validate the findings of this study and enhance the generalizability and applicability of the results across different contexts and populations.

## 9. Conclusion

In conclusion, this paper demonstrated the relationship between Internet Addiction and well-being among university students and discussed related factors, such as parental strain, study strain, self-identity, and resources. The Conservation of Resources theory, as one of the two leading theories in the aspect of stress, has been applied to this topic as a very first attempt. Numerous limitations and suggestions are stated.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- American Psychiatric Association (APA) (2013). *Internet Gaming Disorder*. [https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/DSM/APA\\_DSM-5-Internet-Gaming-Disorder.pdf](https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/DSM/APA_DSM-5-Internet-Gaming-Disorder.pdf)
- Barker, E. T., & Galambos, N. L. (2003). Body Dissatisfaction of Adolescent Girls and Boys: Risk and Resources Factors. *The Journal of Early Adolescence*, 23, 141-165. <https://doi.org/10.1177/0272431603023002002>
- Bernardi, S., & Pallanti, S. (2009). Internet Addiction: A Descriptive Clinical Study Focusing on Comorbidities and Dissociative Symptoms. *Comprehensive Psychiatry*, 50, 510-516. <https://doi.org/10.1016/j.comppsy.2008.11.011>



- Busiol, D., & Lee, T. Y. (2015). Prevention of Internet Addiction: The P.A.T.H.S. Program. In T. Y. Lee, D. T. L. Shek, & R. C. F. Sun (Eds.), *Student Well-Being in Chinese Adolescents in Hong Kong: Theory, Intervention and Research* (pp. 185-193). Springer. [https://doi.org/10.1007/978-981-287-582-2\\_14](https://doi.org/10.1007/978-981-287-582-2_14)
- Census and Statistics Department (2023). *Thematic Household Survey Report—Report No. 77—Information Technology Usage and Penetration*. Census and Statistics Department, the Government of the Hong Kong Special Administrative Region.
- Chen, S., Weng, L., Su, Y., Wu, H., & Yang, P. (2003). Development of a Chinese Internet Addiction Scale and Its Psychometric Study. *Chinese Journal of Psychology*, 45, 279-294.
- Cheung, J. C., Chan, K. H., Lui, Y., Tsui, M., & Chan, C. (2018). Psychological Well-Being and Adolescents' Internet Addiction: A School-Based Cross-Sectional Study in Hong Kong. *Child and Adolescent Social Work Journal*, 35, 477-487. <https://doi.org/10.1007/s10560-018-0543-7>
- Chung, T. W. H., Sum, S. M. Y., & Chan, M. W. L. (2019). Adolescent Internet Addiction in Hong Kong: Prevalence, Psychosocial Correlates, and Prevention. *Journal of Adolescent Health*, 64, S34-S43. <https://doi.org/10.1016/j.jadohealth.2018.12.016>
- Crews, F., He, J., & Hodge, C. (2007). Adolescent Cortical Development: A Critical Period of Vulnerability for Addiction. *Pharmacology Biochemistry and Behavior*, 86, 189-199. <https://doi.org/10.1016/j.pbb.2006.12.001>
- Davis, R. A. (2001). A Cognitive-Behavioral Model of Pathological Internet Use. *Computers in Human Behavior*, 17, 187-195. [https://doi.org/10.1016/s0747-5632\(00\)00041-8](https://doi.org/10.1016/s0747-5632(00)00041-8)
- Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X. et al. (2020). An Investigation of Mental Health Status of Children and Adolescents in China during the Outbreak of COVID-19. *Journal of Affective Disorders*, 275, 112-118. <https://doi.org/10.1016/j.jad.2020.06.029>
- Fung, S. (2019). Psychometric Evaluation of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) with Chinese University Students. *Health and Quality of Life Outcomes*, 17, Article No. 46. <https://doi.org/10.1186/s12955-019-1113-1>
- Griffiths, M. D. (1998). Internet Addiction: Does It Really Exist? In J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications* (pp. 61-75). Academic Press.
- Gu, X., & Mao, E. (2023). The Impacts of Academic Stress on College Students' Problematic Smartphone Use and Internet Gaming Disorder under the Background of Neijuan: Hierarchical Regressions with Mediation Analysis on Escape and Coping Motives. *Frontiers in Psychiatry*, 13, Article 1032700. <https://doi.org/10.3389/fpsy.2022.1032700>
- Hankin, B. L., Mermelstein, R., & Roesch, L. (2007). Sex Differences in Adolescent Depression: Stress Exposure and Reactivity Models. *Child Development*, 78, 279-295. <https://doi.org/10.1111/j.1467-8624.2007.00997.x>
- Hobfoll, S. E., Halbesleben, J., Neveu, J., & Westman, M. (2018). Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 103-128. <https://doi.org/10.1146/annurev-orgpsych-032117-104640>
- Hobfoll, S. E., Nadler, A., & Leiberman, J. (1986). Satisfaction with Social Support during Crisis: Intimacy and Self-Esteem as Critical Determinants. *Journal of Personality and Social Psychology*, 51, 296-304. <https://doi.org/10.1037/0022-3514.51.2.296>
- Hsieh, K., Hsiao, R. C., Yang, Y., Lee, K., & Yen, C. (2019). Relationship between Self-Identity Confusion and Internet Addiction among College Students: The Mediating Effects of Psychological Inflexibility and Experiential Avoidance. *International Journal of Envi-*



- ronmental Research and Public Health*, 16, Article 3225.  
<https://doi.org/10.3390/ijerph16173225>
- Huang, X., Zhang, H., Li, M., Wang, J., Zhang, Y., & Tao, R. (2010). Mental Health, Personality, and Parental Rearing Styles of Adolescents with Internet Addiction Disorder. *Cyberpsychology, Behavior, and Social Networking*, 13, 401-406.  
<https://doi.org/10.1089/cyber.2009.0222>
- Israelashvili, M., Kim, T., & Bukobza, G. (2012). Adolescents' Over-Use of the Cyber World—Internet Addiction or Identity Exploration? *Journal of Adolescence*, 35, 417-424.  
<https://doi.org/10.1016/j.adolescence.2011.07.015>
- Jang, H., Song, J., & Kim, R. (2014). Does the Offline Bully-Victimization Influence Cyberbullying Behavior among Youths? Application of General Strain Theory. *Computers in Human Behavior*, 31, 85-93. <https://doi.org/10.1016/j.chb.2013.10.007>
- Jeong, E. J., Ferguson, C. J., & Lee, S. J. (2019). Pathological Gaming in Young Adolescents: A Longitudinal Study Focused on Academic Stress and Self-Control in South Korea. *Journal of Youth and Adolescence*, 48, 2333-2342.  
<https://doi.org/10.1007/s10964-019-01065-4>
- Jun, S., & Choi, E. (2015). Academic Stress and Internet Addiction from General Strain Theory Framework. *Computers in Human Behavior*, 49, 282-287.  
<https://doi.org/10.1016/j.chb.2015.03.001>
- Kandell, J. J. (1998). Internet Addiction on Campus: The Vulnerability of College Students. *CyberPsychology & Behavior*, 1, 11-17. <https://doi.org/10.1089/cpb.1998.1.11>
- Kim, B., & Park, J. (2013). The Effects of Academic Stress on Depression in Adolescents: The Moderating Role of Response Styles. *Korean Journal of Child Studies*, 34, 113-128.
- Kim, J. H., Lau, C. H., Cheuk, K., Kan, P., Hui, H. L. C., & Griffiths, S. M. (2009a). Brief Report: Predictors of Heavy Internet Use and Associations with Health-Promoting and Health Risk Behaviors among Hong Kong University Students. *Journal of Adolescence*, 33, 215-220. <https://doi.org/10.1016/j.adolescence.2009.03.012>
- Kim, J., LaRose, R., & Peng, W. (2009b). Loneliness as the Cause and the Effect of Problematic Internet Use: The Relationship between Internet Use and Psychological Well-Being. *CyberPsychology & Behavior*, 12, 451-455. <https://doi.org/10.1089/cpb.2008.0327>
- Kurniasanti, K. S., Assandi, P., Ismail, R. I., Nasrun, M. W. S., & Wiguna, T. (2019). Internet Addiction: A New Addiction? *Medical Journal of Indonesia*, 28, 82-91.  
<https://doi.org/10.13181/mji.v28i1.2752>
- Lau, J. T. F., Gross, D. L., Wu, A. M. S., Cheng, K., & Lau, M. M. C. (2017). Incidence and Predictive Factors of Internet Addiction among Chinese Secondary School Students in Hong Kong: A Longitudinal Study. *Social Psychiatry and Psychiatric Epidemiology*, 52, 657-667. <https://doi.org/10.1007/s00127-017-1356-2>
- Lavoie, J. A. A., & Pychyl, T. A. (2001). Cyberslacking and the Procrastination Superhighway: A Web-Based Survey of Online Procrastination, Attitudes, and Emotion. *Social Science Computer Review*, 19, 431-444. <https://doi.org/10.1177/089443930101900403>
- Leahey, T. M., Crowther, J. H., & Mickelson, K. D. (2007). The Frequency, Nature, and Effects of Naturally Occurring Appearance-Focused Social Comparisons. *Behavior Therapy*, 38, 132-143. <https://doi.org/10.1016/j.beth.2006.06.004>
- Leung, L., & Lee, P. S. N. (2012). Impact of Internet Literacy, Internet Addiction Symptoms, and Internet Activities on Academic Performance. *Social Science Computer Review*, 30, 403-418. <https://doi.org/10.1177/0894439311435217>
- Liao, Z., Chen, X., Huang, Q., & Shen, H. (2022). Prevalence of Gaming Disorder in East Asia: A Comprehensive Meta-analysis. *Journal of Behavioral Addictions*, 11, 727-738.

- <https://doi.org/10.1556/2006.2022.00050>
- Lingnan University (2020). *LU Study Reveals over 60% of Hong Kong University Students Have Found Online Learning Not as Effective as Face-to-Face Teaching during COVID-19 Pandemic*.  
<https://www.ln.edu.hk/sgs/news/lu-study-reveals-over-60-of-hong-kong-university-students-have-found-online-learning-not-as-effective-as-face-to-face-teaching-during-covid-19-pandemic>
- Mazalin, D., & Moore, S. (2004). Internet Use, Identity Development and Social Anxiety among Young Adults. *Behaviour Change*, 21, 90-102.  
<https://doi.org/10.1375/bech.21.2.90.55425>
- Moawad, R. A. (2020). Online Learning during the COVID-19 Pandemic and Academic Stress in University Students. *Revista Romaneasca pentru Educatie Multidimensionala*, 12, 100-107. <https://doi.org/10.18662/rrem/12.1sup2/252>
- Mylona, I., Deres, E. S., Dere, G. S., Tsinopoulos, I., & Glynatsis, M. (2020). The Impact of Internet and Videogaming Addiction on Adolescent Vision: A Review of the Literature. *Frontiers in Public Health*, 8, Article 63.  
<https://doi.org/10.3389/fpubh.2020.00063>
- Plante, C., Gentile, D., Groves, C., Modlin, A., & Blanco-Herrera, J. (2018). Video Games as Coping Mechanisms in the Etiology of Video Game Addiction. *Psychology of Popular Media Culture*, 8, 385-394.
- Prime, H., Wade, M., & Browne, D. T. (2020). Risk and Resilience in Family Well-Being during the COVID-19 Pandemic. *American Psychologist*, 75, 631-643.  
<https://doi.org/10.1037/amp0000660>
- Raith, L., Bignill, J., Stavropoulos, V., Millea, P., Allen, A., Stallman, H. M. et al. (2021). Massively Multiplayer Online Games and Well-Being: A Systematic Literature Review. *Frontiers in Psychology*, 12, Article 698799. <https://doi.org/10.3389/fpsyg.2021.698799>
- Schmit, S., Chauchard, E., Chabrol, H., & Sejourne, N. (2011). Évaluation des caractéristiques sociales, des stratégies de coping, de l'estime de soi et de la symptomatologie dépressive en relation avec la dépendance aux jeux vidéo en ligne chez les adolescents et les jeunes adultes. *L'Encéphale*, 37, 217-223.  
<https://doi.org/10.1016/j.encep.2010.06.006>
- Schraml, K., Perski, A., Grossi, G., & Simonsson-Sarnecki, M. (2011). Stress Symptoms among Adolescents: The Role of Subjective Psychosocial Conditions, Lifestyle, and Self-Esteem. *Journal of Adolescence*, 34, 987-996.  
<https://doi.org/10.1016/j.adolescence.2010.11.010>
- Shaw, M., & Black, D. W. (2008). Internet Addiction: Definition, Assessment, Epidemiology and Clinical Management. *CNS Drugs*, 22, 353-365.  
<https://doi.org/10.2165/00023210-200822050-00001>
- She, R., Wong, K., Lin, J., Leung, K., Zhang, Y., & Yang, X. (2021). How COVID-19 Stress Related to Schooling and Online Learning Affects Adolescent Depression and Internet Gaming Disorder: Testing Conservation of Resources Theory with Sex Difference. *Journal of Behavioral Addictions*, 10, 953-966.
- Siomos, K., Floros, G., Fisoun, V., Evaggelia, D., Farkonas, N., Sergeantani, E. et al. (2012). Evolution of Internet Addiction in Greek Adolescent Students over a Two-Year Period: The Impact of Parental Bonding. *European Child & Adolescent Psychiatry*, 21, 211-219.  
<https://doi.org/10.1007/s00787-012-0254-0>
- Spada, M. M., Nikčević, A. V., Moneta, G. B., & Wells, A. (2008). Metacognition, Perceived Stress, and Negative Emotion. *Personality and Individual Differences*, 44, 1172-1181.  
<https://doi.org/10.1016/j.paid.2007.11.010>

- Stice, E., & Whitenton, K. (2002). Risk Factors for Body Dissatisfaction in Adolescent Girls: A Longitudinal Investigation. *Developmental Psychology, 38*, 669-678. <https://doi.org/10.1037/0012-1649.38.5.669>
- Stice, E., Hayward, C., Cameron, R. P., Killen, J. D., & Taylor, C. B. (2000). Body-Image and Eating Disturbances Predict Onset of Depression among Female Adolescents: A Longitudinal Study. *Journal of Abnormal Psychology, 109*, 438-444. <https://doi.org/10.1037/0021-843x.109.3.438>
- Suh, S. U., & Lee, Y. H. (2007). The Relationships between Daily Hassles, Social Support, Absorption Trait and Internet Addiction. *Korean Journal of Clinical Psychology, 26*, 391-405. <https://doi.org/10.15842/kjcp.2007.26.1.022>
- Sun, Y., & Wilkinson, J. S. (2020). Parenting Style, Personality Traits, and Interpersonal Relationships: A Model of Prediction of Internet Addiction. *International Journal of Communication, 14*, 23.
- The Department of Health (2018). *General Situation of Use of Internet and Electronic Screen Products among Hong Kong Students and the World Health Organization's Suggestion on "Gaming Disorder"*. The Government of the Hong Kong Special Administrative Region. [http://www.studenthealth.gov.hk/tc\\_chi/internet/files/healthy\\_use\\_of\\_internet\\_ppt\\_8\\_feb\\_2018.pdf](http://www.studenthealth.gov.hk/tc_chi/internet/files/healthy_use_of_internet_ppt_8_feb_2018.pdf)
- The Office of the Communication Authority (2018). *The Facts: Telecommunications*. The Government of the Hong Kong Special Administrative Region. <https://www.ofca.gov.hk/filemanager/ofca/en/>
- Velezmore, R., Lacefield, K., & Roberti, J. W. (2010). Perceived Stress, Sensation Seeking, and College Students' Abuse of the Internet. *Computers in Human Behavior, 26*, 1526-1530. <https://doi.org/10.1016/j.chb.2010.05.020>
- Wang, L., & Jiang, S. (2021). The Effects of Strain and Negative Emotions on Adolescent Cyberbullying Perpetration: An Empirical Test of General Strain Theory. *Current Psychology, 42*, 11439-11449. <https://doi.org/10.1007/s12144-021-02426-8>
- Wilks, S. E. (2008). Resilience amid Academic Stress: The Moderating Impact of Social Support among Social Work Students. *Advances in Social Work, 9*, 106-125. <https://doi.org/10.18060/51>
- Wu, A. M. S., Li, J., Lau, J. T. F., Mo, P. K. H., & Lau, M. M. C. (2016). Potential Impact of Internet Addiction and Protective Psychosocial Factors onto Depression among Hong Kong Chinese Adolescents—Direct, Mediation and Moderation Effects. *Comprehensive Psychiatry, 70*, 41-52. <https://doi.org/10.1016/j.comppsy.2016.06.011>
- Young, K. S., & Abreu, C. N. (2011). *Internet Addiction: A Handbook and Guide to Evaluation and Treatment*. Wiley.
- Yurdagül, C., Kircaburun, K., Emirtekin, E., Wang, P., & Griffiths, M. D. (2021). Psychopathological Consequences Related to Problematic Instagram Use among Adolescents: The Mediating Role of Body Image Dissatisfaction and Moderating Role of Gender. *International Journal of Mental Health and Addiction, 19*, 1385-1397. <https://doi.org/10.1007/s11469-019-00071-8>