Internet Addiction amongst University Students under COVID-19:

Prevalence and Correlates

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Photo: https://i1.wp.com/international-education.blog/wp-content/uploads/2019/11/mobile-phone-1087845_1920.jpg?resize=1200%2C675&ssl=1

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Introduction

Background of the Study

Photo: https://www.claytonbehavioral.com/internet-problems

Internet addiction (IA)

- Psychological, social, academic, and occupational problems
- Young people are the most vulnerable to IA
- Hong Kong had the highest number of electronic devices owned by students
- High prevalence of IA in university students
- Few studies to understand IA in college students under the pandemic

→**To understand (1) prevalence, (2) socio-demographic correlates, and (3) risk and protective factors for IA**

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Introduction

Risk and Protective Factors of Internet Addiction

Risk Factors

- Boredom
- Emotional distress (Depression, anxiety, stress)
- PTSD
- Hopelessness
- Suicidal ideation & behavior
- Psychological needs satisfaction
- Interpersonal difficulties

Protective Factors

- Life satisfaction
- Resilience
- Beliefs about adversity
- Emotional competence
- Self-control
- Self-esteem
- Family relationship quality and functioning

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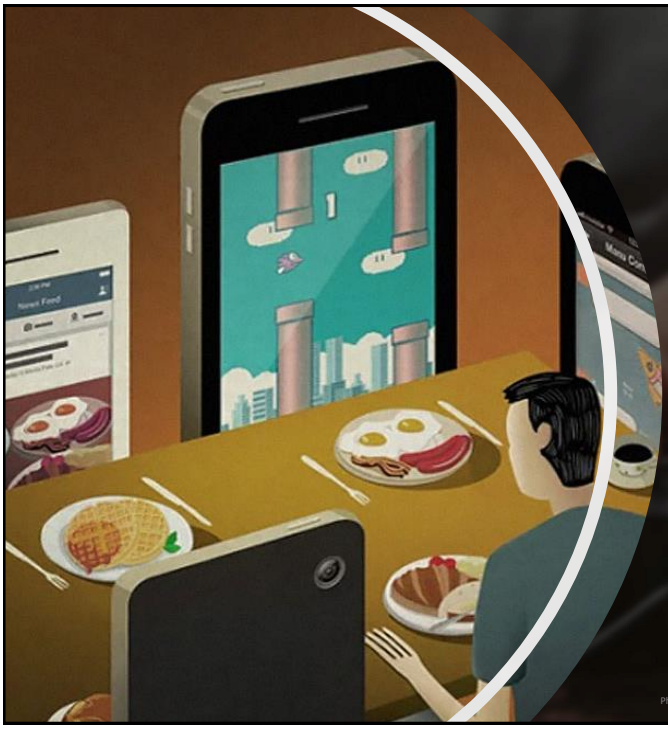

Research Questions and Method

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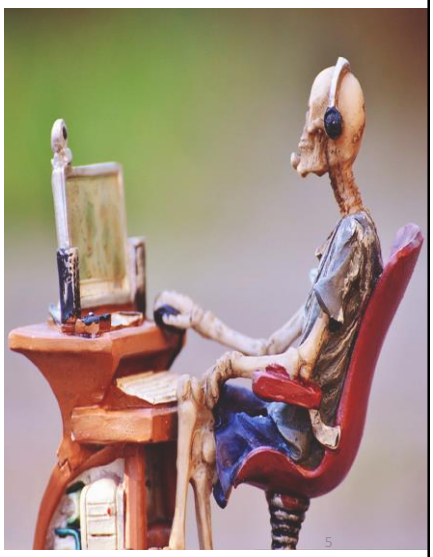
Photo: https://cdn.architecturendesign.net/wp-content/uploads/2016/01/AD-Satirical-Illustrations-Show-Our-Addiction-To-Technology-57.jpg
https://technofaq.org/wp-content/uploads/2020/03/video-game-addiction-1024x682.jpg

RQs & Method

Research Questions

1. **Extent of the IA problem** in Hong Kong university students under the pandemic?
2. **Sociodemographic factors** related to IA in university students in Hong Kong?
3. What are the **relationships between IA and other mental health problems** indexed by mental health problems, unmet needs and difficulties encountered?
4. What are the **relationships between difficulties encountered, stress and IA**?
5. **IA related to positive psychological constructs** (e.g., beliefs about adversity and psychosocial competence)?



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RQs & Method

Research Questions

- **H1:** IA prevalence would be pervasive
- **H2a:** Age would be negatively related to IA
  H2b: Financial strain would be positively related to IA
- **H3:** IA would be positively related to different measures of psychological morbidity, unmet psychosocial needs and challenges encountered
- **H4 & H5:** Difficulties encountered would be positively related to stress and IA, with stress serving as a mediating factor
- **H6:** IA would be negatively related to positive psychological constructs

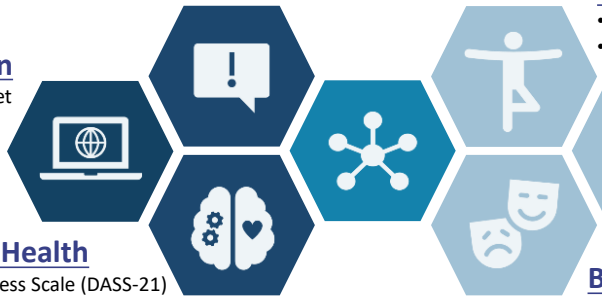
RQs & Method

Instruments

Needs Unmet and Difficulties Encountered
- Needs Unmet During COVID-19
- Difficulties Encountered Under COVID-19

Positive Well-being
- The Satisfaction With Life Scale (SWLS)
- Flourishing Scale (FS)

Internet Addiction
- Young's 10-item Internet Addiction Test (IAT-10)



Family functioning
- Chinese Family Assessment Instrument (C-FAI)

Negative Mental Health
- Depression Anxiety Stress Scale (DASS-21)
- Post-Traumatic Stress Disorder (TSQ)
- Centre for Epidemiological Studies Depression Scale Revised (CESD-R)
- Suicidal Ideation and Suicidal Behaviour
- Beck Hopelessness Scale

Sociodemographic
- Age, gender, year of study, etc.
- Financial status

Belief of Adversity, Resilience & Emotional Competence
- Chinese Cultural Beliefs of Adversity (CBA)
- Chinese Positive Youth Development Scale (CPYDS)

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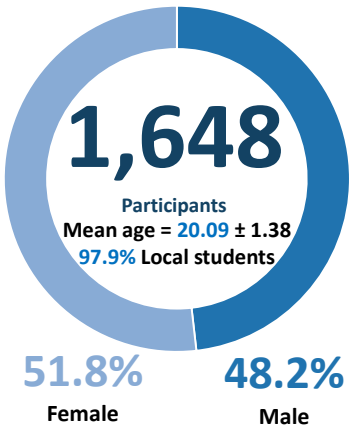
RQs & Method

Participants and Procedures



Procedures
- Quota sampling
- Online survey via Qualtrics XM
- From January to March 2021

Financial Status of Participants
- **21.3%** of participants' families were experiencing financial difficulties
- **29.2%** of participants were experiencing personal financial difficulties
- 96.8% of participants' families were not receivers of the CSSA

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Results

Descriptive Statistics (measures were reliable)

Table 1 | Descriptive Statistics of the Major Variables

Variables	Mean (SD)	Cronbach's a (Mean inter-item correlation)
Internet Addiction	3.78 (2.61)	0.75 (0.23)
Risk Factors		
DASS-Depression	5.91 (4.43)	0.88 (0.52)
DASS-Anxiety	5.39 (4.15)	0.86 (0.47)
DASS-Stress	6.27 (4.46)	0.89 (0.55)
PTSD	3.63 (2.62)	0.75 (0.23)
CESD	18.82 (15.21)	0.96 (0.52)
Hopelessness	3.41 (0.85)	0.83 (0.49)
Suicidal Ideation	0.99 (1.64)	0.81 (0.68)
Suicidal Behaviour	0.07 (0.18)	0.57 (0.36)
Needs Unmet	3.22 (0.73)	0.89 (0.34)
Difficulties Encountered	3.10 (0.60)	0.91 (0.30)
Protective Factors		
Life Satisfaction	2.56 (0.56)	0.87 (0.58)
Flourishing	4.50 (1.01)	0.91 (0.57)
Beliefs of Adversity	3.89 (0.65)	0.79 (0.30)
Resilience	4.03 (0.82)	0.78 (0.55)
Emotional Competence	3.97 (0.89)	0.81 (0.59)
Family Functioning	3.31 (0.58)	0.77 (0.28)

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Results

Prevalence of Internet Addiction and Responses to the Items in the Internet Addiction Test

Table 2 | Prevalence of Internet Addiction and Participants' Responses to The Items in The Internet Addiction Test

Items in The Internet Addiction Test (Internet use behaviours in the past 12 months)	Yes		No	
	N	%	N	%
1. Do you feel preoccupied with the Internet or online services and think about it while offline?	761	46.2	887	53.8
2. Do you feel a need to spend more and more time online to achieve satisfaction?	795	48.2	853	51.8
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?	675	41.0	973	59.0
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?	622	37.7	1026	62.3
5. Do you stay online longer than originally intended?	953	57.8	695	42.2
6. Have you jeopardized or risked the loss of a significant relationship, job, educational or career opportunity because of the Internet?	413	25.1	1235	74.9
7. Have you lied to family members, teachers, social workers, or others to conceal the extent of involvement with the Internet?	416	25.2	1232	74.8
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?	761	46.2	887	53.8
9. Do you keep returning even after spending too much money on online fees?	361	21.9	1287	78.1
10. Do you feel depressed, irritable, moody, or anxious when you are offline?	475	28.8	1173	71.2
Participants can be classified as having internet addiction (Young's criteria: A person is classified as "internet addiction" if he/she shows 4 or more of the listed behaviours.)	856	51.9	792	48.1

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Results

Demographic Correlates

Table 3 | Demographic Correlates of Internet Addiction

Demographic Variables	Internet Addiction
Age	-0.07**
Gender	0.01
Year of Study	-0.05*
Local or International Student	0.04
Family receiving CSSA or not	0.02
Family experiencing financial difficulties at the present time	0.01
Personal experiencing financial difficulties at the present time	-0.08[a]

Note. *$p < .05$; **$p < .01$; [a]$p = 0.001$

Significant correlates but with low effect size

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Results

Correlation of Internet Addiction and Risk Factors

Table 4 | Correlation of Internet Addiction and Risk Factors (DASS, PTSD, CESD, Suicidal Ideation, Suicidal Behaviour, Hopelessness, Needs Unmet and Difficulties Encountered)

	1	2	3	4	5	6	7	8	9	10
1. Internet Addiction	-									
2. DASS-Depression	0.33***	-								
3. DASS-Anxiety	0.29***	0.79***	-							
4. DASS-Stress	0.35***	0.85***	0.86***	-						
5. PTSD	0.53***	0.36***	0.36***	0.40***	-					
6. CESD	0.39***	0.76***	0.73***	0.76***	0.43***	-				
7. Suicidal Ideation	0.20***	0.47***	0.48***	0.47***	0.22***	0.68***	-			
8. Suicidal Behaviour	0.21***	0.29***	0.26***	0.28***	0.16***	0.33***	0.37***	-		
9. Hopelessness	0.24***	0.43***	0.36***	0.36***	0.23***	0.38***	0.21***	0.10***	-	
10. Needs Unmet	0.19***	0.22***	0.13***	0.18***	0.24***	0.26***	0.20***	0.12***	0.18***	-
11. Difficulties Encountered	0.34***	0.44***	0.41***	0.46***	0.35***	0.40***	0.07***	0.08***	0.27***	0.15***

*Note. *p < .05; **p < .01; ***p < 0.001*

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Results

Predicting Effects of Risk Factors

Table 5 | Hierarchical Multiple Regression Results on Predicting Effects of Risk Factors on Internet Addiction

Predictors	**Internet Addiction**		
Step 1	**β**	**t**	**Cohen's f^2**
Age	-0.076	-2.124*	0.003
Gender	0.014	0.557	0.000
Year of Study	-0.004	-0.117	0.000
Local or International Students	0.048	1.908	0.002
Family Receiving CSSA	0.029	1.181	0.001
Family Experiencing Financial Difficulty	0.047	1.759	0.002
Personal Experiencing Financial Difficulty	-0.105	-3.918***	0.009
R2	0.018		
F	4.223***		
Step 2	**β**	**t**	**Cohen's f^2**
PTSD	0.400	17.461***	0.185
CESD	0.163	4.867***	0.014
Suicidal Ideation	-0.056	-1.914	0.002
Suicidal Behaviour	0.089	4.087***	0.009
Hopelessness	0.054	2.465*	0.003
Needs Unmet	0.043	2.031*	0.002
Difficulties Encountered	0.103	4.403***	0.011
R2	0.353		
R2 Change	0.336		
F	63.714***		

*Note. *p < .05; **p < .01; ***p < 0.001*

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Results

Predicting Effects of Risk Factors - DASS

Table 6 | Hierarchical Multiple Regression Results on Predicting Effects of Risk Factors on Internet Addiction

Predictors	**Internet Addiction**		
Step 1	**β**	**t**	**Cohen's *f*²**
Age	-0.076	-2.124*	0.003
Gender	0.014	0.557	0.000
Year of Study	-0.004	-0.117	0.000
Local or International Students	0.048	1.908	0.002
Family Receiving CSSA	0.029	1.181	0.001
Family Experiencing Financial Difficulty	0.047	1.759	0.002
Personal Experiencing Financial Difficulty	-0.105	-3.918***	0.009
R2	0.018		
F	4.223***		
Step 2	**β**	**t**	**Cohen's *f*²**
DASS-Depression	0.162	3.633***	0.008
DASS-Anxiety	-0.045	-0.993	0.001
DASS-Stress	0.252	4.676***	0.014
R2	0.145		
R2 Change	0.127		
F	27.708***		

*Note. *p < .05; **p < .01; ***p < 0.001*

Results

Mediating Effect of DASS-Stress and Difficulties Encountered

Table 7 | Mediating Effect Analyses of DASS-Stress (The Mediator) on The Effect of Difficulties Encountered on Internet Addiction

Regression model for Internet addiction (DV)	Difficulties encountered (IV)		
	β	*SE*	*t*
Total effect of IV on DV	0.34	0.10	14.58***
IV to Mediator (DASS-Stress)	0.46	0.16	20.81***
Mediator to DV	0.24	0.01	9.53***
Direct effect of IV on DV	0.23	0.11	8.97***
Mediating effect	Point estimate	Bootstrapping (BC 95% CI)	
		Lower	Upper
	0.11	0.09	0.13

*Note. *** p < 0.001*

Results

Correlation of Internet Addiction and Protective Factors

Table 8 | Correlation of Internet Addiction and Protective Factors (Life Satisfaction, Flourishing, Beliefs of Adversity, Resilience, Emotional Competence, and Family Functioning)

	1	2	3	4	5	6	7
1. Internet Addiction	-						
2. Life Satisfaction	-0.11***	-					
3. Flourishing	-0.20***	0.43***	-				
4. Beliefs of Adversity	-0.12***	0.23***	0.53***	-			
5. Resilience	-0.15***	0.36***	0.65***	0.54***	-		
6. Emotional Competence	-0.18***	0.37***	0.62***	0.51***	0.67***	-	
7. Family Functioning	-0.08**	0.23***	0.40***	0.31***	0.30***	0.30***	-

*Note. *p < .05; **p < .01; ***p < 0.001*

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Results

Predicting Effects of Protective Factors

Table 9 | Hierarchical Multiple Regression Results on Predicting Effects of Protective Factors on Internet Addiction

Predictors	**Internet Addiction**		
Step 1	**β**	**t**	**Cohen's f^2**
Age	-0.076	-2.124*	0.003
Gender	0.014	0.557	0.000
Year of Study	-0.004	-0.117	0.000
Local or International Students	0.048	1.908	0.002
Family Receiving CSSA	0.029	1.181	0.001
Family Experiencing Financial Difficulty	0.047	1.759	0.002
Personal Experiencing Financial Difficulty	-0.105	-3.918***	0.009
R2	0.018		
F	4.223***		
Step 2	**β**	**t**	**Cohen's f^2**
Life Satisfaction	-0.020	-0.725	0.001
Flourishing	-0.131	-3.637***	0.009
Beliefs of Adversity	-0.014	-0.450	0.001
Resilience	0.008	0.217	0.000
Emotional Competence	-0.097	-2.767**	0.005
Family Functioning	-0.009	-0.336	0.001
R2	0.066		
R2 Change	0.048		
F	8.813***		

*Note. *p < .05; **p < .01; ***p < 0.001*

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Discussion and Conclusion

https://policyoptions.irpp.org/wp-content/uploads/sites/2/2020/01/Facebook-Technology-isn%E2%80%99t-shaping-work-the-way-we-think.jpg

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Discussion

Prevalence of IA

- High prevalence during the pandemic (similar to other studies)

Sociodemographic correlates

- Age is a potential factor correlated with IA
  - Weaker emotional management and self-regulation in younger age
- No gender difference in scores of IA
  - Inconsistent with existing literature; more studies should be conducted
- Personal financial difficulty is a risk factor to IA

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Discussion

Comorbidity and Risk Factors

- **Depression, stress, PTSD, suicidal behaviour, and hopelessness** are potential comorbidity and risk factors to IA during the pandemic (consistent with and extending existing literature)
- **Needs dissatisfaction and difficulties encountered** are potential risk factors to IA during the pandemic (novel in existing literature)
- **Stress could serve as a mediating mechanism underlying** the relationship between difficulties encountered and IA

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Discussion

Protective Factors

- **Flourishing and emotional competence** might be two unique protective factors of IA during the pandemic
- **No significant predicting effect of family functioning on IA**
  - Inconsistent with existing studies
  - Further research should be conducted
  - Possible explanation:
    a) The protective role of family relationship might be weaker during stage of late adolescence
    b) Unmet of other needs might not be compensated by family relationship

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Discussion

Implications

Theoretical Implication

- **Compensatory Internet use theory** (the Internet as a compensation for unsatisfied needs) (Kardefelt-Winther, 2014), and **cognitive behavioural model** (people go online to escape real-life issues) (Davis, 2001)
- **Healthy functioning (e.g., flourishing and emotional competence) plays important role in reducing IA** (Dou & Shek, 2021)

Practical Implication

- Pay particular attention to **several unique risk and protective factors** of IA during the pandemic in intervention or prevention

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Discussion

Limitations

- Cross-sectional data
- Participants were from one university in Hong Kong (although large sample size)
- Short version of IAT

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Photo: https://www.polyu.edu.hk/photo-gallery/S0156