

## **Appendix S1: The Methods and Results of this Study**

### **Methods**

#### **Data Collection**

During the COVID-19 pandemic crisis, classes of all schools were suspended, and social distancing measures were implemented in Hong Kong. It is challenging to coordinate different schools and organizations to collect a representative community sample to study student mental health during this period. Snowball sampling was adopted in this research to identify the student participants. Snowball sampling is a type of non-probability sampling technique that is used to identify potential participants where they are hard to locate. In this study, some students were initially invited to fill out a questionnaire and they were asked to spread the questionnaire to their schoolmates and friends who were studying in local secondary schools. The questionnaire was administrated using digital survey to minimize personal contact. The questionnaire was disseminated by the student participants through various social media platforms, including WhatsApp, Instagram, and Facebook. The survey was conducted between April and May 2020. All parents and students were informed about the voluntary basis of participation and gave informed consent. None of the participants received any remuneration for participating. The study was approved by the Research Ethics Committee of Hong Kong Baptist University.

#### **Measures**

Demographic characteristics included age, gender, and grade (Form 1-6 in the Hong Kong education system) of the participants was collected to provide a basic background information of the participants in the research.

The Kessler Psychological Distress Scale (K6) is an abbreviated version of the distress scale K10, which is broadly used to screen for serious mental illness.<sup>1</sup> There are six items to measure whether a respondent felt (1) nervous, (2) hopeless, (3) restless or fidgety, (4) depressed, (5) that everything was an effort, and (6) worthless in the past month. Each item of K6 is quantified using a 5-point Likert scale (0 = *none of the time*; 1 = *a little of the time*; 2 = *some of the time*; 3 = *most of the time*; 4 = *all of the time*). The total score ranges from 0-24. The scoring rule used is to classify respondents with scores of 13–24 as having probable serious mental illness and those with scores of 0–12 as not having serious mental illness. The psychometric properties of the K6 was evaluated in the Chinese student population.<sup>2</sup> The test-retest reliability of the K6 scale was 0.79, the Cronbach's alpha was 0.84, and its area under the receiver operating curve for diagnosing serious mental illness was 0.85 (95% CI = 0.80–0.90). In the current study, the Cronbach's alpha was 0.89.

There were self-constructed items to investigate participants' help-seeking behaviors, intention to use online counselling, perceived benefits of online counselling, preferred channels, and past counselling experience. To identify participant's help-seeking behavior in response to mental distress, a question was self-constructed with four items asking if a respondent seeks help from the four common sources including: (1) talking to friends, (2) talking to family, (3) seeking help from a professional counsellor, and (4) using crisis line services. The items were measured using a yes/no checklist format.

Based on a recent study that investigated the relationship between students' intention to use online counselling and previous counselling experience. Related questions were self-constructed to fit the situation in the current study.<sup>3</sup> A question examined students' likely intentions to use online counselling: "If online counselling service is available, and you are feeling distressed, would you use the service?" with two available responses of yes/no. Three questions were constructed to explore the participants' previous counselling experience. The

three questions ascertained the participants whether they have previous counselling experience in yes/no format and explore their feeling and the effectiveness of the counselling experience by rating from 1 to 10.

The literature shows that there are at least three possible benefits of using online platform for counselling namely convenient access, confidentiality and anonymity, and high level of security.<sup>4,5</sup> Three yes/no questions were asked to understand the participants' perceived benefits of online counselling. There were also three items to explore the preference of the participants on using which online platforms to have online counselling, including email, instant message, and video chat. The items were measured using a yes/no checklist format.

### **Statistical Analysis**

Descriptive statistics for categorical variables were shown by numbers and percentages, and descriptive statistics for continuous variables were shown by means and standard deviations. Gender, age, and grade differences were investigated by Chi-square test. Multiple binary logistic regression analyses were conducted to demonstrate the associations of participants' mental distress with (1) their demographic characteristics and (2) help-seeking behaviors. The participants without mental distress served as the reference group in the logistic regression analyses. Multiple binary logistic regression analyses were also conducted to demonstrate the associations of participants' intention to use online counselling with (1) their perceived benefits of online counselling, (2) preferred channels, and (3) past counselling experience. The participants who did not intend to use online counselling served as the reference group in the logistic regression analyses. Participants' mental distress is the moderator variable. The odds ratio and 95% confidence interval (CI) was presented. The analyses were adjusted by gender,

age, and grade. All statistical computations were performed by using statistical software R (R for Windows, V.3.6.3).

## Results

300 participants were recruited in the study. There were significant differences in terms of gender, age, and grade ( $p < .001$ ). Among the participants, 64% ( $n = 192$ ) were female, 58% ( $n = 174$ ) aged between 15 and 17 years old, and 26% ( $n = 78$ ) were in Form 4. There were 36% of participants ( $n = 109$ ) suffered from mental distress. The associations of mental distress with demographic characteristics and help-seeking behaviors are shown in Table 1. Participants in Form 6 were eight times more likely to exhibit mental distress than those in Form 1. Participants who would seek help from friends and family were associated with a decreased likelihood of exhibiting mental distress. There were no other significant associations.

45% of participants without mental distress ( $n = 86$ ) intended to use online counselling. Table 2 shows the associations of intention to use online counseling with benefits of online counselling, preferred channels, and past counselling experience in participants without mental distress. For participants who did not have mental distress, those in Form 4 were five times more likely to utilize online counselling than those in Form 1. Participants who considered online counselling as secure were associated with an increased likelihood of utilizing online counselling. Participants who preferred using instant chat and video chat for counselling were more intending to use online counselling. There were no other significant associations.

42% of participants without mental distress ( $n = 46$ ) intended to use online counselling. Table 3 shows the associations of intention to use online counseling with benefits of online counselling, preferred channels, and past counselling experience in participants with mental distress. For participants who had mental distress, those with higher level of perceived

effectiveness of their previous counselling sessions were more intending to use online counselling. There were no other significant associations.

## References

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2. Kang YK, Guo WJ, Xu H *et al.* The 6-item Kessler psychological distress scale to survey serious mental illness among Chinese undergraduates: Psychometric properties and prevalence estimate. *Compr. Psychiatry.* 2015; **63**: 105-112.
3. Glasheen KJ, Shochet I, Campbell MA. Online counselling in secondary schools: would students seek help by this medium?. *Br. J. Guid. Counc.* 2016; **44**: 108-122.
4. Hanley T, Ersahin Z, Sefi A, Hebron J. Comparing online and face-to-face student counselling: what therapeutic goals are identified and what are the implications for educational providers?. *J. Psychol. Couns. Sch.* 2017; **27**: 37-54.
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## Tables

Table 1. Associations of mental distress with demographic characteristics and help-seeking behaviors

	Exhibiting mental distress		OR (95% CI)	p
	No n (%)	Yes n (%)		
<b>Baseline model</b>				
<b>Gender</b>				
Male	67 (35)	41 (38)	1	
Female	124 (65)	68 (62)	0.85 (0.50, 1.45)	.558
<b>Age</b>				
18 years old or Above	16 (8)	26 (24)	1	
15-17 years old	111 (58)	63 (58)	0.90 (0.34, 2.44)	.826
11-14 years old	64 (34)	20 (18)	1.36 (0.31, 6.44)	.688
<b>Grade</b>				
Form 1	25 (13)	8 (7)	1	
Form 2	31 (16)	5 (5)	0.55 (0.15, 1.90)	.353
Form 3	22 (12)	10 (9)	1.83 (0.53, 6.39)	.334
Form 4	52 (27)	26 (24)	2.44 (0.57, 11.30)	.238
Form 5	42 (22)	25 (23)	2.90 (0.65, 13.89)	.169
Form 6	19 (10)	35 (32)	8.48 (1.70, 45.99) *	.011
<b>Help-seeking behaviors</b>				
<b>Talking to friends</b>				
No	42 (22)	46 (42)	1	
Yes	149 (78)	63 (58)	0.36 (0.18, 0.69) **	.003
<b>Talking to family</b>				
No	124 (65)	92 (84)	1	
Yes	67 (35)	17 (16)	0.36 (0.17, 0.71) **	.004
<b>Seeking professional help</b>				
No	160 (84)	92 (84)	1	
Yes	31 (16)	17 (16)	1.15 (0.55, 2.35)	.714
<b>Using crisis line service</b>				
No	188 (98)	106 (97)	1	
Yes	3 (2)	3 (3)	1.46 (0.24, 9.04)	.673

\*p < .05.

\*\*p < .01.

Table 2. Associations of intention to use online counselling with benefits of online counselling, preferred channels, and past counselling experience in participants without mental distress

	Having intention to use online counselling		OR (95% CI)	p
	No	Yes		
	n (%)	n (%)		
<b>Baseline model</b>				
Gender				
Male	35 (33)	32 (37)	1	
Female	70 (67)	54 (63)	0.84 (0.44, 1.58)	.589
Age				
18 years old or Above	9 (9)	7 (8)	1	
15-17 years old	63 (60)	48 (56)	0.95 (0.23, 3.90)	.945
11-14 years old	33 (31)	31 (36)	3.46 (0.52, 25.07)	.205
Grade				
Form 1	15 (14)	10 (12)	1	
Form 2	17 (16)	14 (16)	1.54 (0.51, 4.77)	.450
Form 3	12 (11)	10 (12)	2.72 (0.68, 11.82)	.165
Form 4	27 (26)	25 (29)	5.07 (1.06, 27.97) *	.049
Form 5	23 (22)	19 (22)	4.71 (0.93, 27.11)	.069
Form 6	11 (10)	8 (9)	3.99 (0.55, 31.06)	.175
<b>Perceived benefits of online counselling</b>				
Convenient access				
No	42 (40)	23 (27)	1	
Yes	63 (60)	63 (73)	1.85 (0.98, 3.56)	.060
Confidentiality and anonymity				
No	34 (32)	25 (29)	1	
Yes	71 (68)	61 (71)	0.92 (0.47, 1.82)	.814
High level of security				
No	65 (62)	36 (42)	1	
Yes	40 (38)	50 (58)	2.47 (1.32, 4.71) **	.005
<b>Preferred online channels</b>				
Email				
No	92 (88)	73 (85)	1	
Yes	13 (12)	13 (15)	1.16 (0.48, 2.83)	.745
Instant message				
No	15 (14)	2 (2)	1	
Yes	90 (86)	84 (98)	5.48 (1.38, 36.85) *	.033
Video chat				
No	88 (84)	58 (67)	1	
Yes	17 (16)	28 (33)	2.52 (1.23, 5.34) *	.013
<b>Past counselling experience</b>				
Having counselling experience				
No	82 (78)	62 (72)	1	
Yes	23 (22)	24 (28)	1.79 (0.32, 10.92)	.505



	Mean (SD)	Mean (SD)		
Feeling of the counselling experience	6.6 (2.0)	6.6 (1.6)	0.88 (0.50, 1.46)	.617
Perceived effectiveness of the counselling experience	5.7 (2.1)	6.2 (2.3)	1.27 (0.84, 2.01)	.267

\*p < .05.

\*\*p < .01.

Table 3. Associations of intention to use online counselling with benefits of online counselling, preferred channels, and past counselling experience in participants with mental distress

	Having intention to use online counselling		OR (95% CI)	p
	No	Yes		
	n (%)	n (%)		
<b>Baseline model</b>				
Gender				
Male	21 (33)	20 (43)	1	
Female	42 (67)	26 (57)	0.74 (0.32, 1.73)	.489
Age				
18 years old or Above	13 (21)	13 (28)	1	
15-17 years old	41 (65)	22 (48)	0.32 (0.06, 1.30)	.132
11-14 years old	9 (14)	11 (24)	0.29 (0.02, 4.08)	.364
Grade				
Form 1	2 (3)	6 (13)	1	
Form 2	2 (3)	3 (7)	0.48 (0.04, 5.78)	.554
Form 3	7 (11)	3 (7)	0.14 (0.01, 1.20)	.091
Form 4	17 (27)	9 (20)	0.16 (0.01, 3.29)	.241
Form 5	14 (22)	11 (24)	0.22 (0.01, 4.32)	.321
Form 6	21 (33)	14 (30)	0.09 (0.00, 1.83)	.130
<b>Perceived benefits of online counselling</b>				
Convenient access				
No	39 (62)	24 (52)	1	
Yes	24 (38)	22 (48)	1.47 (0.65, 3.36)	.358
Confidentiality and anonymity				
No	20 (32)	11 (24)	1	
Yes	43 (68)	35 (76)	1.35 (0.52, 3.65)	.539
High level of security				
No	38 (60)	23 (50)	1	
Yes	25 (40)	23 (50)	1.34 (0.56, 3.23)	.512
<b>Preferred online channels</b>				
Email				
No	52 (83)	36 (78)	1	
Yes	11 (17)	10 (22)	1.85 (0.65, 5.26)	.244
Instant message				
No	6 (10)	4 (9)	1	
Yes	57 (90)	42 (91)	1.17 (0.26, 5.51)	.838
Video chat				
No	51 (81)	32 (70)	1	
Yes	12 (19)	14 (30)	1.77 (0.67, 4.77)	.252
<b>Past counselling experience</b>				
Having counselling experience				
No	42 (67)	29 (63)	1	
Yes	21 (33)	17 (37)	4.81 (0.85, 40.71)	.099

	Mean (SD)	Mean (SD)		
Feeling of the counselling experience	5.2 (2.2)	6.1 (2.9)	0.45 (0.16, 1.02)	.084
Perceived effectiveness of the counselling experience	4.3 (2.2)	5.5 (2.6)	3.12 (1.24, 10.48) *	.032

\*p < .05.

\*\*p < .01.