



Short Communication

Mental health crisis under COVID-19 pandemic in Hong Kong, China



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ABSTRACT

Objectives: To compare the mental health burden before and during the COVID-19 outbreak and identify the vulnerable groups by sociodemographic factors.

Methods: We analyzed repeated cross-sectional data from the Hong Kong Family and Health Information Trend Survey (FHInTS) in 2016 (N = 4036) and 2017 (N = 4051) and the COVID-19 Health Information Survey (CoVHInS) in April 9–23, 2020 (N = 1501) using population-based random samples of general adults by landline telephone and online panel. Stress (Perceived Stress Scale 4), anxiety symptoms (General Anxiety Disorders 2), depression symptoms (Patient Health Questionnaire-2), subjective happiness (4-point Likert item), and sociodemographic factors were collected.

Results: Compared with 2016 and 2017, the stress level increased by 28.3%, prevalence of anxiety increased by 42.3%, and the depression symptoms and unhappiness have doubled (all P for trends <0.001) during the COVID-19 outbreak. The increases in stress levels were significantly larger among older and less educated respondents (P for interactions <0.001).

Conclusion: Hong Kong had a mental health emergency even with no lockdown and well-managed outbreaks. Older and under-privileged people will suffer most. Public mental health interventions are urgently needed particularly for the older adults and individuals with primary or lower education attainment.

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Introduction

Globally, mental health crises are emerging under the COVID-19 pandemic. Monitoring the population mental health burden and identifying vulnerable groups for targeted assistance is a public health priority (Wang et al., 2020a).

In Hong Kong, the first COVID-19 was reported on January 18, 2020. The outbreak peaked in late March with 1035 confirmed cases by April 23, 2020 (Leung et al., 2020). Hong Kong has been praised as a model of successful control of the outbreak without enforced lockdown, but with high compliance of social distancing and voluntary mass masking in the population since the end of January (Cowling et al., 2020). By combining data from two past population-based surveys conducted in 2016 and 2017, and a new

survey in April 2020, we compared the population mental health symptoms before and during the outbreak and identified vulnerable groups by sociodemographic factors.

Methods

We analyzed repeated cross-sectional data from the Hong Kong Family and Health Information Trend Survey (FHInTS) (Zhao et al., 2019) in 2016 (N = 4036) and 2017 (N = 4051) and the COVID-19 Health Information Survey (CoVHInS) in April 2020 (N = 1501) with response rates of 74.4%, 70.2%, and 61.3%, respectively. We used random digital dialing by landline telephone to sample Chinese-speaking adults aged 18+ years. CoVHInS additionally sampled respondents from a population-representative mobile online panel for rapid recruitment (response rate 61.7%). Respondents sampled from landline numbers were interviewed via telephone, whereas those from the mobile panel self-administered the survey online.

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Table 1
Trends of mental health symptoms in Hong Kong adult population.

	2016 (N = 4036)	2017 (N = 4054)	April 2020 (N = 1501)	P for trend
Stress level				
Mean (SD)	5.61 (2.86)	5.85 (2.90)	7.20 (2.12)	
Crude β (95% CI)	0 [reference]	-0.03 (-0.25, 0.18)	1.80 (1.59, 2.01) ^b	<0.001
Adjusted β (95% CI) ^a	0 [reference]	0.48 (0.16, 0.74)	1.72 (1.52, 1.92) ^b	<0.001
Anxiety				
No. (%)	456 (11.3)	377 (9.3)	237 (15.8)	
Crude OR (95% CI)	1 [reference]	0.92 (0.80, 1.07)	1.45 (1.21, 1.72) ^b	<0.001
Adjusted OR (95% CI) ^a	1 [reference]	1.17 (0.96, 1.44)	1.42 (1.19, 1.70) ^b	<0.001
Depression				
No. (%)	291 (7.2)	255 (6.3)	221 (14.8)	
Crude OR (95% CI)	1 [reference]	0.95 (0.80, 1.13)	2.13 (1.76, 2.57) ^b	<0.001
Adjusted OR (95% CI) ^a	1 [reference]	1.20 (0.94, 1.53)	2.07 (1.71, 2.51) ^b	<0.001
Unhappiness				
No. (%)	476 (11.8)	469 (11.6)	354 (23.6)	
Crude OR (95% CI)	1 [reference]	0.98 (0.86, 1.12)	2.32 (2.00, 2.70) ^b	<0.001
Adjusted OR (95% CI) ^a	1 [reference]	1.14 (0.94, 1.38)	2.27 (1.95, 2.65) ^b	<0.001

Abbreviations: β , regression coefficient; OR, odds ratio.^a Adjusting for sex, age, marital status and education attainment.^b $P < 0.001$.

Stress was measured by Perceived Stress Scale-4 (PSS-4); the score ranged from 0 to 16 with higher scores indicating higher stress levels (Cohen et al., 1983). Anxiety and depression symptoms were measured by the General Anxiety Disorders-2 (GAD-2) and the Patient Health Questionnaire-2 (PHQ-2), both ranging from 0 to 6 and a score of ≥ 3 indicates anxiety or depression symptom, respectively (Kroenke et al., 2009). Subjective happiness was assessed on a 4-point Likert item rated from “very happy” to “not happy at all” (Oswald and Wu, 2010). Sociodemographic factors were collected. Data were weighted by sex, age, and education

distributions in the general adult population. We used multivariable regressions to examine population changes in mental health symptoms by survey year, adjusting for sociodemographic factors. Analyses were performed using STATA 15.1 (StataCorp., USA). The Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster approved the studies, and informed consent was obtained.

Table 2
Trends of mental health symptoms by sex, age, and education in Hong Kong adult population.

	Adjusted OR/ β (95% CI) ^a						
	Sex		Age groups		Education attainment		
	Male	Female	18–59 years	60+ years	Primary or below	Secondary	Tertiary
Stress level							
2016	0 [reference]	0 [reference]	0 [reference]	0 [reference]	0 [reference]	0 [reference]	0 [reference]
2017	0.07 (-0.27, 0.41)	0.11 (-0.15, 0.37)	-0.44 (-0.85, -0.02) ^a	0.03 (-0.27, 0.32)	-0.07 (-0.58, 0.43)	-0.10 (-0.47, 0.26)	-0.29 (-0.72, 0.14)
2020	1.53 (1.21, 1.85) ^d	1.77 (1.51, 2.04) ^d	0.84 (0.54, 1.14) ^d	2.40 (2.12, 2.67) ^d	2.78 (2.28, 3.27) ^d	1.83 (1.54, 2.12) ^d	0.82 (0.46, 1.18) ^d
Interaction	0.54		<0.001		<0.001		
Anxiety							
2016	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
2017	0.95 (0.74, 1.22)	1.01 (0.84, 1.21)	0.76 (0.57, 1.00)	1.06 (0.84, 1.33)	1.13 (0.79, 1.61)	0.85 (0.64, 1.13)	0.80 (0.59, 1.10)
2020	1.44 (1.09, 1.90) ^b	1.36 (1.08, 1.72) ^c	1.09 (0.77, 1.39)	1.88 (1.46, 2.45) ^d	1.58 (1.00, 2.49) ^b	1.39 (1.08, 1.78) ^c	1.28 (0.93, 1.76)
Interaction	0.79		0.006		0.99		
Depression							
2016	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
2017	0.95 (0.71, 1.26)	1.06 (0.85, 1.33)	0.73 (0.53, 1.01)	1.25 (0.95, 1.65)	1.08 (0.72, 1.62)	1.00 (0.72, 1.38)	0.87 (0.59, 1.28)
2020	1.88 (1.39, 2.53) ^d	2.13 (1.65, 2.74) ^d	1.68 (1.30, 2.18) ^d	2.54 (1.90, 3.40) ^d	1.97 (1.23, 3.18) ^d	1.92 (1.46, 2.53) ^d	2.09 (1.47, 2.95) ^d
Interaction	0.72		0.12		0.92		
Unhappiness							
2016	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
2017	1.01 (0.81, 1.25)	1.01 (0.85, 1.20)	0.92 (0.69, 1.21)	1.05 (0.86, 1.28)	0.99 (0.74, 1.33)	1.05 (0.82, 1.35)	0.90 (0.66, 1.24)
2020	2.18 (1.73, 2.74) ^d	2.31 (1.88, 2.83) ^d	2.09 (1.67, 2.62) ^d	2.47 (2.00, 3.04) ^d	2.09 (1.48, 2.97) ^d	2.20 (1.78, 2.73) ^d	2.44 (1.82, 3.28) ^d
Interaction	0.94		0.086		0.85		

Abbreviations: β , regression coefficient; OR, odds ratio.^a Adjusting for sex, age, education level, and marital status.^b $P < 0.05$.^c $P < 0.01$.^d $P < 0.001$.

Results

The stress level and prevalence of anxiety and depressive symptoms and subjective unhappiness were similar between 2016 and 2017 but greatly increased during the COVID-19 outbreak (Table 1). Compared with 2016, the proportion of unhappiness and depressive symptoms doubled; the mean score of PSS-4 increased by 23.1% and proportion of anxiety symptom increased by 39.8% (all *P* for trends <0.001). Subgroup analyses by sex, age, and education showed that respondents who were older (aged 60+) tend to show a larger increase in all mental health outcomes. The increases in stress level were significantly larger among older and less educated respondents (*P* for interactions <0.001) (Table 2).

Discussion

This is the first report showing alarming increases in mental health symptoms after a long period of social distancing and severe disruption of daily life (about 10–12 weeks) under COVID-19 in an overcrowded city, where people were free to go out anytime and restaurants and shops remained open. Our results show that Hong Kong had a mental health emergency even with no lockdown, and suggest the magnitude of mental health crisis would be greater in countries with more severe outbreak and more stringent containment policies. During the initial phase of the outbreak in China, moderate-to-severe anxiety and depression symptoms were reported by 28.8% and 16.5% respondents, respectively (Wang et al., 2020b). Mental health burden in other epicenters warrants further investigation. We have shown that older and under-privileged people will suffer most. Targeted public health interventions are urgently needed particularly for the older adults and individuals with primary or lower education attainment. Health information and communication should be accessible and suitable for community practice, especially for those who are not comfortable in seeking and processing online information. As face-to-face social interactions and center-based activities are not practicable, the use of social media and urgent mobilization of voluntary community social support and emergency remedy are needed to reduce the harms from mental ill-health especially in the most vulnerable.

This study has several limitations. Data on mental health burden in 2018 and 2019 (with major social unrest since June 2019) are unavailable; however, the prevalence of depression remains higher in April 2020 (14.8%) than in fall of 2019 (11.2%), as reported in another survey (Ni et al., 2020). A cross-sectional design restricted the causal interpretation. The simple measures we used for mental health symptoms have limited the clinical implications and more rigorous measurements were warranted (Hao et al., 2020). Personality traits and pre-existing psychological problems were not controlled.

Author contributions

SZZ, JYHW, and MPW conceived and designed the study. SZZ and MPW did the statistical analysis and wrote the first draft of the manuscript. All authors interpreted the data, participated in the critical review of the report, and provided final approval for publication submission. SZZ and MPW are accountable for the accuracy and integrity of the study.

Conflict of interest

All authors declared that they have no conflict of interest in this study.

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