

COVID-19 pandemic impact on mental and professional cognition: A questionnaire survey on a sample of GP trainees and GPs

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ABSTRACT

Background: Since the outbreak of 2019 coronavirus disease (COVID-19), general practitioners (GPs) have been working in the frontline under psychological and physical pressure. This study aims to evaluate the psychological health, career prospective, attitudes toward educational mode changes, and knowledge about COVID-19. **Methods:** An online anonymous questionnaire survey was carried out on GP trainees and GPs from June 2022 to September 2022. The survey mainly consisted of four parts: 1) general information; 2) level of knowledge about COVID-19; 3) psychological and physical health impact; and 4) changes in professional perception. **Results:** The total knowledge score of 43 GP trainees and 38 GPs was 334 and 283, respectively, without significant difference ($z = -0.839, P = 0.402$). There was no statistical difference between the scores of GP trainees and GPs for each subindicator of mental and physical disorders. Eleven GP trainees and four GPs had severe psychological disorder subindexes. Severe somatization disorder subindexes were found in eight GP trainees and five GPs. Also, 67.44% of GP trainees and 52.63% of GPs had a positive attitude toward GP career. Moreover, 62.79% of GP trainees and 52.63% of GPs considered the epidemic had no impact on their professional cognition. Among GP trainees, 62.8% and 32.6% considered the epidemic had no or slight impact on their academic activities, respectively. Also, 53.5% and 44.2% of GP trainees partially and fully approved online teaching, respectively. The most popular forms were live and recorded courses. **Conclusions:** COVID-19 pandemic had no noticeable impact on their physical and mental health and their attitude toward GP career.

Keywords: Career prospective, China, COVID-19, general practitioners, knowledge, mental health

Introduction

Coronavirus disease 2019 (COVID-19) places a huge burden on health services and the national economy.^[1,2] In the prevention and control of the epidemic, the effect of community, street, and village management is obvious, which indicated that general

practitioners (GPs) play a key role.^[3] Working in the frontline of epidemic prevention and control, GPs are involved in all aspects of controlling the virus.^[4,5] They are mainly responsible for nucleic acid testing, preventing the transmission of the virus, and for the physical and mental health of patients. This high-stress work environment can affect their physical and mental health and career recognition.^[6-8] As the GP of the future, GP trainees also had an important role during the epidemic.

Few studies have analyzed the impact of the epidemic on GP trainees. We carried out a survey to assess GPs' basic understanding of the virus, their mental status, the acceptance level of online

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education, and their attitude to their future career. Furthermore, this study indirectly assessed whether the epidemic affected the professional attitude and job competency (psychological and public health ability/disease prevention and control ability) of GP trainees to become general primary care providers and increased the professional confidence of general primary care providers and family physicians.

Methods

A self-administered electronic version of the questionnaire was sent to WeChat group of the GPs and GP trainees from June 2022 to September 2022, and everyone voluntarily and truthfully filled out the contents. The survey was anonymous. The first section of the questionnaire investigated the general aspects of the GPs and GP trainees, such as gender, age, marital status, working time or length of schooling, community work experience, the highest degree of qualification, etc., The second section investigated the GPs' and GP trainees' general knowledge of COVID-19 with nine items; they could get 1 point for each correct answer and the total score was 10 points. The third part assessed the mental impact of the epidemic on the GPs and GP trainees, mainly including eight items (anxiety, depression, hypochondriasis, feeling of loneliness, anger, fear, attentional bias, negative thought), and somatization symptoms with seven items (insomnia, fatigue and tiredness, loss of appetite, chest tightness and shortness of breath, dizziness and headache, excessive attention to physical discomfort, behavioral abnormality). The mental status was graded in the form of "How often in the past 1/2 weeks or longer did you feel?" with answers such as "none of the time" to "longer than 2 weeks," and the items were rated on a scale of 0–5 correspondingly. Eventually, total scores were calculated for every respondent. The fourth section was the GP trainees' and GPs' attitudes to career prospectives that was graded with three items. In addition, they were investigated the most evident mood disorders occurred in which time epidemic outbreak and how far away from their own residences. The impact of the epidemic on the students' study and their preferred online teaching methods were investigated.

Statistical analysis

Numerical data was expressed as mean (M) and standard deviation (SD) ($M \pm SD$). Chisquare association test was done to compare the proportions. For numerical data, *t*-test or *z*-test was performed to compare the means. Descriptive statistics like number and percentage were used for categorical data. The Statistical Package for Social Sciences 20.0 was used to carry out statistical analyses. In all instances, $P < 0.05$ was considered statistically significant.

Results

General information about the respondents

Forty-three GP trainees and 38 GPs participated in the survey of this study. Thirty-one GP trainees were graduated with a Bachelor's degree, and 28 GPs held a Master's degree. Also, 48.84% of GP trainees and 92.11% of GPs had rotation

experience of emergency department, infectious department, or intensive care unit. Sixteen GPs had more than 3 years of experience in general practice. The demographics of 81 participants are presented in Table 1.

Level of knowledge of COVID-19

There was no statistical difference in knowledge about COVID-19 between GP trainees and GPs [Table 2]. The accuracy of transmission routes, clinical symptoms, disease classification, and incubation period were less than 85% and still need to be strengthened [Table 3].

Mental and physical health

There was no statistical difference in the psychological scores for each subitem between GP trainees and GPs [Table 4]. Eleven

Table 1: General information of respondents

	GP trainees		GPs	
	n	%	n	%
Sex				
Male	17	39.53	15	39.47
Female	26	60.47	23	60.53
Age (years)				
20–30	33	76.74	7	18.42
30–35	6	13.95	12	31.58
35–40	1	2.33	12	31.58
40	3	6.98	7	18.42
Education				
Undergraduate	31	72.09	28	73.68
Master	5	11.63	10	26.32
Junior	0	0.00	0	0.00
Postgraduate student	7	16.28	0	0.00
Marriage				
Married	34	79.07	31	81.58
Unmarried	9	20.93	7	18.42
Divorced	0	0.00	0	0.00
Years of work in GP (years)				
1	21	48.84	22	57.89
2	11	25.58		
3	11	25.58		
3–5	0	0.00	5	13.16
5–10	0	0.00	5	13.16
10	0	0.00	6	15.79
Experience in the emergency, ICU, or infectious department rotation				
Yes	21	48.84	35	92.11
No	22	51.16	3	7.89
Whether to support the epidemic work				
Yes	43	100.00	38	100.00
No	0	0.00	0	0.00

GP=General practitioner, ICU=Intensive care unit

Table 2: Overall knowledge about COVID-19 between GP trainees and GPs

	Score	M±SD	Z	P-score
GP trainees	334	7.77±1.32	-0.839	0.402
GPs	283	7.45±1.66		

COVID-19=Coronavirus disease 2019, GP=General practitioner, SD=Standard deviation

cases of GP trainees and four GPs had severe psychological disorder subindexes. Eighteen GP trainees and nine GPs had moderate mood disorder subindexes. There was no statistical difference in the somatic scores for each subitem between GP trainees and GPs [Table 5]. Severe somatization disorder subindexes were found in eight GP trainees and five GPs. There are 13 GP trainees and five GPs who had moderate somatization disorder subindexes. Constituent ratios of graded psychological and somatic subitems are shown in Tables 6 and 7, respectively.

Attitude toward professional career

Twenty-nine (67.44%) GP trainees and 20 (52.63%) GPs had a positive attitude toward medical practice after COVID-19. There were 62.79% GP trainees and 52.63% GPs who considered that the epidemic had no impact on their professional cognition.

Table 3: Knowledge about COVID-19 between GP trainees and GPs

	GP trainees		GPs		χ^2	P
	n	%	n	%		
Name	41	95.35	35	92.11	0.02	0.886
Conditions to destroy the virus	43	100%	38	100%		
Transmission mode	36	83.72	33	86.84	0.156	0.693
Mask usage	41	95.35	33	86.84	0.928	0.335
Clinical symptoms	31	72.09	26	68.42	0.130	0.718
Classification of infectious diseases	40	93.02	34	89.47	0.029	0.864
Disease classification	35	81.40	32	84.21	0.112	0.738
Epidemiology	37	86.05	33	86.84	0.011	0.917
Latent period	33	76.74	28	73.68	0.102	0.800

COVID-19=Coronavirus disease 2019, GP=General practitioner

Table 4: Comparison of psychological scores between GP trainees and GPs

	GP trainees	GPs	P
Anxiety disorder	0.95±0.22	0.76±0.17	0.498
Depression	0.49±0.16	0.39±0.10	0.621
Hypochondriasis	0.35±0.12	0.21±0.08	0.346
Feeling of loneliness	0.65±0.14	0.34±0.09	0.074
Anger	0.47±0.14	0.50±0.12	0.848
Fear and panic	0.51±0.15	0.29±0.10	0.221
Attentional bias	0.35±0.12	0.39±0.11	0.778
Negative thinking	0.40±0.11	0.35±0.12	0.796

GP=General practitioner

Table 5: Comparison of somatic scores between GP trainees and GPs

	GP trainees	GPs	P
Sleep disorder	0.35±0.14	0.55±0.17	0.367
Fatigue	0.91±0.19	0.79±0.21	0.685
Appetite disorder	0.35±0.10	0.29±0.11	0.691
Chest tightness and shortness of breath	0.21±0.09	0.18±0.07	0.832
Dizziness and headache	0.21±0.09	0.24±0.07	0.812
Excessive attention to physical discomfort	0.21±0.09	0.24±0.07	0.803
Behavior disorder	0.37±0.14	0.11±0.05	0.086

GP=General practitioner

The influence of epidemic on the academic activities of GP trainees

Exactly 62.8% of GP trainees believed that the epidemic had no impact on their studies, and 32.6% believed that the epidemic had a slight impact on their studies. In addition, 53.5% of the students partially approved online teaching and 44.2% of GP trainees fully approved online teaching. The most popular forms of online teaching are live and recorded courses.

Discussion

GP training includes clinical rotation in hospitals and communities and participation in a variety of teaching activities such as case discussion, clinical skills training, teaching outpatient, etc., After 3 years of standardized GP training, GPs trainees will be independently responsible for various medical activities in primary care units.

During the epidemic period, the trainees also actively participated in the prevention and control of the epidemic. This unusual experience might have affected their physical and mental health and understanding of their future career to some extent. If the work stress was beyond their tolerance, they would have experienced some negative emotions such as mental and physical disorder, cognitive bias, and so on.^[9]

During the epidemic, GPs are more or less prone to mood disorders due to changes in lifestyle and work patterns and fear of being infected.^[10] For GPs trainees, there can be also other psychological triggers, such as academic and job-seeking. Psychological disorders can have a variety of symptoms, such as anxiety, depression and other mental and behavioral disorders. Several studies had shown that general practitioners suffered from anxiety and depression.^[11-14] Hypochondriasis, feeling of loneliness, anger, fear, attentional bias, negative thought are rarely assessed.

In this study, based on self-report questionnaires, there were four GP trainees with severe anxiety and two with severe depression. As for the GP trainees, there were two GP trainees with severe anxiety and one GP trainee with severe attention bias and anger. It can be found that most GP trainees or GPs showed no emotional disorder or mild mood disorder, which is different from a previous study.^[15] This may be due to the trust of GPs in the prevention and control measures taken by the government and hospital leaders, their high level of knowledge about the virus, rich experiences from previous outbreaks, their good psychological quality, and their own ways of relieving emotions.

In this study, we also analyzed the impact of the epidemic on somatization disorders of GP trainees and GPs, which are currently less reported. Severe somatized symptoms of GPs were fatigue, sleep disorders, and appetite disorders. Severe somatization manifestations of GP trainees were fatigue, sleep

Table 6: Constituent ratio of graded psychological subitem

	GP trainees								GPs							
	Normal		Slight		Moderate		Severe		Normal		Slight		Moderate		Severe	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sleep disorder	35	81.40	5	11.63	2	4.65	1	2.33	25	65.79	10	26.32	2	5.26	1	2.63
Fatigue	20	46.51	16	37.21	4	9.30	3	6.98	21	55.26	13	34.21	1	2.63	3	7.89
Appetite disorder	32	74.42	8	18.60	2	4.65	1	2.33	30	78.95	6	15.79	1	2.63	1	2.63
Chest tightness and shortness of breath	37	86.05	4	9.30	1	2.33	1	2.33	32	84.21	5	13.16	1	2.63	0	0.00
Dizziness and headache	37	86.05	4	9.30	1	2.33	1	2.33	29	76.32	9	23.68	0	0.00	0	0.00
Excessive attention to physical discomfort	36	83.72	6	13.95	1	2.33	0	0.00	29	76.32	9	23.68	0	0.00	0	0.00
Behavior disorder	34	79.07	6	13.95	2	4.65	1	2.33	34	89.47	4	10.53	0	0.00	0	0.00

GP=General practitioner. The score is calculated according to the severity of psychological impairment (0–5 points), which is expressed by counting data, in which 0 is normal, 1 is mild, 2–3 is moderate, and 4–5 is severe

Table 7: Constituent ratio of graded somatic subitem

	GP trainees								GPs							
	Normal		Slight		Moderate		Severe		Normal		Slight		Moderate		Severe	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Anxiety disorder	21	48.84	16	37.21	2	4.65	4	9.30	18	47.37	16	42.11	2	5.26	2	5.26
Depression	32	74.42	6	13.95	3	6.98	2	4.65	25	65.79	12	31.58	1	2.63	0	0.00
Hypochondriasis	33	76.74	8	18.60	1	2.33	1	2.33	31	81.58	6	15.79	1	2.63	0	0.00
Loneliness	23	53.49	16	37.21	3	6.98	1	2.33	26	68.42	11	28.95	1	2.63	0	0.00
Anger	29	67.44	11	25.58	2	4.65	1	2.33	23	60.53	12	31.58	2	5.26	1	2.63
Fear and panic	29	67.44	10	23.26	3	6.98	1	2.33	29	76.32	8	21.05	1	2.63	0	0.00
Attentional bias	33	76.74	7	16.28	2	4.65	1	2.33	26	68.42	10	26.32	1	2.63	1	2.63
Negative thinking	30	69.77	11	25.58	2	4.65	0	0.00	11	64.71	6	35.29	0	0.00	0	0.00

GP=General practitioner. The score (0–5) is calculated according to the severity of somatization disorder and is expressed by counting data, in which 0 is normal, 1 is mild, 2–3 is moderate, and 4–5 is severe

disorders, appetite disorders, chest tightness, shortness of breath, headaches, and abnormal behavior.

The understanding of the novel coronavirus is mainly based on the naming of the virus, transmission route, clinical manifestations, clinical typing, epidemiology and proper use of masks, and so on. Management of COVID-19 is focused on preventing its spread.^[16] Transmission generally occurred within 2–10 days, but the incubation period can be as long as 14 days in some patients.^[17,18] The main transmission routes are contact transmission, aerosol transmission, and respiratory transmission.^[19] In this study, their level of knowledge about COVID-19 is acceptable. But knowledge of transmission routes, clinical symptoms, disease classification, and incubation period still need to be further improved and trained.

COVID19 pandemic has adversely effected the teaching and training work in most of the parts of world.^[20-23] This has led to discontinuation of face-to-face teaching activities, such as clinical case discussion, lectures, outpatient teaching, and appearance of online teaching.^[24] Facing COVID-19 outbreak, teachers had to adopt new teaching methods on the premise of ensuring the quality of teaching.^[20-23] After all, online teaching has certain disadvantages, such as slow network, lack of quiet environment, less interaction, and so on, which may be the reason why most students chose recorded lectures and live courses. In this study, most GP trainees considered their academic activities were not affected and accepted online teaching. This result may be related to the teachers' efficient teaching technology, strong adaptability of the students, flexibility of online teaching, etc.

Also, during COVID-19, 67.44% of GP trainees still had a positive attitude toward medicine. The career choices of GP trainees and GPs were not substantially affected; 65% of GP trainees still chose community employment. In addition, 18.6% of GP trainees and 13.16% of GPs reported an increase in professional identity.

In short, this study showed that GP trainees were not significantly affected by the epidemic, both psychologically and academically. This also indicated that they can be competent for primary health care after the training.

Limitations and implications

The limitations of our study include its small sample size, data sources obtained from one region, and using a self-report survey method. In the future, we need to comprehensively assess the impact of the epidemic on GPs' psychological and professional views by comparing data from multiple countries and regions.

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Author contributions statement

Haiyan Zhang collected and analyzed data and wrote the original draft.

Data availability

Data available on request.

Ethics statement

The study was approved by the ethics committee of the third affiliated hospital of Sun Yat-Sen University. Written informed consent was obtained from the participants to participate in this study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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