



Mental Health Outcomes Among Civil Servants Aiding in Coronavirus Disease 2019 Control

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Objective: To assess the psychiatric status of Chinese civil servants aiding in coronavirus disease 2019 (COVID-19) control.

Background: During the COVID-19 pandemic, Chinese civil servants have faced high workloads that may contribute to mental disorders. We assessed the prevalence of both depression and anxiety symptoms among civil servants in Jiangsu and surrounding provinces using the Chinese versions of the 9-item Patient Health Questionnaire (PHQ-9) and the 7-item Generalized Anxiety Disorder (GAD-7) scale.

Methods: The PHQ-9 and GAD-7 were used to assess the severity of symptoms of depression and anxiety, respectively. Multivariable logistic regression analysis was performed to identify factors associated with mental health outcomes.

Results: In total, 867 Chinese civil servants aiding in COVID-19 control were included in our study. Overall, 37.25 and 38.06% of all respondents reported having symptoms of depression and anxiety, respectively. Respondents who were younger and more educated and those who had fewer years of work experience had higher scores for both depression and anxiety. Multivariable logistic regression analysis showed that being a woman, being younger, having more education and having fewer years of work experience were associated with a higher risk of symptoms of depression and anxiety. However, whether they had experience combating infectious diseases or worked in frontline, there was no significant difference between respondents with and without experience, as well as between frontline and non-frontline workers, in both symptoms of depression and anxiety.

Conclusions: The civil servants aiding in COVID-19 control reported suffering from varying degrees of mental disorders. Therefore, more attention should be devoted to the psychological distress of these civil servants.

Keywords: depression, anxiety, psychiatry, civil servant, cross-sectional study, COVID-19

INTRODUCTION

In December 2019, an unknown coronavirus was reported in the Chinese city of Wuhan that causes a novel pneumonia, which was named coronavirus disease 2019 (COVID-19), and more than 80,000 people have been diagnosed with this disease (1). This novel coronavirus pneumonia is so severe that China considers it a level B infectious disease and has adopted strict measures as if it were a level A infectious disease to prevent and control transmission (2). Facing this critical situation, the government, including municipal, county and township governments, has mobilized a large number of officials who belong to different departments, such as public health, transportation, and community associations, to deploy and carry out numerous tasks for controlling the spread of COVID-19. Civil servants on the frontline who were directly involved in controlling the spread of COVID-19 were at risk of developing psychological problems and other mental health symptoms. The rapidly rising number of confirmed and suspected cases, overwhelming workload, shortages of personal protective equipment, and uncooperative citizens can cause psychological stress to these workers. These sudden changes can disrupt a person's daily routine, leading to negative emotions, and psychiatric disorders.

Occupational stress has been proven to cause diverse mental disorders, such as depression and anxiety (2, 3). Depression and anxiety were the third and ninth leading causes of disability in the world, respectively, and may cause a serious decline in work efficiency (4, 5). It has been reported that working long hours (6), lack of public support, high job strain level, work insecurity and an uncomfortable physical environment are risk factors for the development of symptoms of depression and anxiety in civil servants, especially in women (6–8). In addition, many civil servants experience emotional disturbances from mental disorders, including depression and anxiety, during and even after epidemics (9). Therefore, it is essential that psychological assessment and intervention for civil servants occur during large-scale epidemics, leading to the early action of psychological intervention and dramatically improved pandemic control and even rapid social recovery (10).

However, there is currently less information about the psychological impact on civil servants during the 2019 coronavirus outbreak and relatively few studies of psychological status and associated factors among civil servants, especially frontline workers, compared to other COVID-19 response workers. Thus, this study aimed to evaluate the psychological state of frontline civil servants by quantifying the magnitude of depression and anxiety symptoms and analyzing potential risk factors related to these symptoms during COVID-19. This research may provide an assessment of the mental health status of Chinese civil servants, which may provide fundamental evidence to direct the promotion of mental well-being among civil servants.

METHOD

Study Design

The study was conducted during the post-pandemic period of COVID-19, from April 9, 2020, to April 11, 2020, and was based on an online questionnaire survey. Through convenience sampling, a total of 867 frontline civil servants mainly in Jiangsu and surrounding provinces were enrolled in this survey. The inclusion criteria were as follows: adults who were proficient in operating mobile phones to fill in the questionnaire and who were informed and agreed to participate in this study. The exclusion criteria were as follows: individuals who were under the age of 18 and anyone who was not willing to participate or not familiar with cell phones to fill in the questionnaire. Approval (Number: 2020IIT 246) from the clinical research ethics committee of the First Affiliated Hospital of Zhejiang University was received before the initiation of this study. An anonymous questionnaire was structured by “WENJUANXING” (<https://www.wjx.cn/>) and made accessible to individuals via WeChat to reduce face-to-face contact and communication. In addition, we added an informed consent section on the first page of the questionnaire. If the participant disagreed with this section, the questionnaire did not proceed to the next page. Participants could terminate taking the survey at any time, and the information was kept confidential.

Demographic Data and Comparison of the Diagnosis of Measurements

Depression (PHQ-9) and Anxiety (GAD-7)

Demographic data included sex, age, job role, years of work experience, educational background, marriage status, experience, and training for COVID-19. We focused on symptoms of depression and anxiety for all participants. Accordingly, the 9-item Patient Health Questionnaire (PHQ-9; range, 0–27) (11) and the 10-item Generalized Anxiety Disorder (GAD-7) scale (range, 0–21) (12) were used to assess the severity of symptoms of depression and anxiety, respectively. The total scores of these measurement tools were interpreted as follows: PHQ-9, normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) depression; GAD-7, normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) anxiety.

Statistical Analysis

In this survey, the median and interquartile range (IQR: 25–75%) were used to describe the continuous and non-normally distributed data, whereas the Mann–Whitney *U*-test or Kruskal–Wallis *H*-test was utilized to measure group differences. Descriptive statistics involved frequencies (%) for categorical variables, and the chi-square test was used to assess group differences. Analyses were performed using SPSS version 20.0 (IBM Corp.), and the data were considered statistically significant when $P < 0.05$.

Quality Control

The Cronbach's alpha values of PHQ-9 and GAD-7 were 0.892 and 0.847, respectively. The cumulative variance contribution rate of PHQ-9 and GAD-7 reached 64.852 and 65.694%,

TABLE 1 | Sociodemographic and psychological characteristics of the study participants.

		No. (%)						P-value	
		Depression		Anxiety		Total	PHQ9	GAD7	
		Yes	No	Yes	No				
Sex	Men	258 (47.43)	139 (43.03)	244 (45.44)	153 (46.36)	397	0.209	0.79	
	Women	286 (2.57)	184 (56.97)	293 (54.56)	177 (53.64)	470			
Age	≤24	63 (19.50)	68 (12.50)	61 (18.48)	70 (13.04)	131	0.03	0.02	
	25–29	43 (13.31)	65 (11.95)	50 (15.15)	58 (10.80)	108			
	30–34	42 (13.00)	85 (15.63)	46 (13.94)	81 (15.08)	127			
	35–39	65 (20.12)	102 (18.75)	51 (15.45)	116 (21.60)	167			
	≥40	110 (34.06)	224 (41.18)	122 (36.97)	212 (39.48)	334			
Marriage	Divorced	5 (1.55)	14 (2.57)	8 (2.42)	11 (2.05)	19	2.965	0.227	
	Single	83 (25.70)	116 (21.32)	92 (27.88)	107 (19.93)	199			
	Married	235 (72.76)	414 (76.10)	230 (69.70)	419 (78.03)	649			
Educational background	Undergraduate	98 (30.34)	113 (20.77)	93 (28.18)	118 (21.97)	211	<0.01	0.21	
	Junior college	115 (35.60)	159 (29.23)	102 (30.91)	172 (32.03)	274			
	High school	105 (32.51)	266 (48.90)	131 (39.70)	240 (44.69)	371			
	Graduate	5 (1.55)	6 (1.10)	4 (1.21)	7 (1.30)	11			
Occupation	Second line	35 (10.84)	67 (12.32)	33 (10.00)	69 (12.85)	102	0.513	0.206	
	Frontline	288 (89.16)	477 (87.68)	297 (90.00)	468 (87.15)	765			
Working years	10–20 y	93 (25.91)	138 (27.17)	71 (21.52)	160 (29.80)	231	<0.01	0.04	
	5–10 y	53 (14.76)	152 (29.92)	79 (23.94)	126 (23.46)	205			
	≤5 y	141 (39.28)	105 (20.67)	106 (32.12)	140 (26.07)	246			
	≥20 y	72 (20.06)	113 (22.24)	74 (22.42)	111 (20.67)	185			
Experienced	1	36 (11.15)	49 (9.01)	35 (10.61)	50 (9.31)	85	0.58	0.76	
	≥2	28 (8.67)	50 (9.19)	31 (9.39)	47 (8.75)	78			
	None	259 (80.19)	445 (81.80)	264 (80.00)	440 (81.94)	704			
Trained or not	Yes	200 (61.92)	338 (62.13)	202 (61.21)	336 (62.57)	538	0.95	0.68	
	No	123 (38.08)	206 (37.87)	128 (38.79)	201 (37.43)	329			

respectively, which also indicates positive validity. A Spearman correlation analysis was used to determine that the correlation coefficient between the GAD-7 anxiety score and the PHQ-9 depression score was 0.374 ($P < 0.01$), indicating the correlation between depression and anxiety among anti-epidemic public servants after the peak of epidemic.

RESULTS

Demographic Characteristics and Comparison of the Diagnosis of Measurements

The comparison between groups of demographic information, exposure history, and psychiatric symptoms, including depressive mood and anxiety, is shown in **Table 1**. In the study, a total of 867 civil servants were recruited in the study, and 867 individuals (66.7%) completed the survey. Among all the respondents, 470 were women (54.2%), and 397 were men (45.8%). The number of people who were under age 24 was 131 (15.1%), 25 to 29 years, 108 (12.4%), 30 to 34 years, 127 (14.7%), 35 to 39 years, 167 (19.3%), and older than 40 years, 334 (38.5%). The number of unmarried people was 199

(22.95%); married 649 (74.86%); and widowed or divorced 19 (2.19%); the education of the individuals was junior high school, 371 (42.79%), junior college, 274 (31.6%), undergraduate, 211 (24.34%), and graduate, 11 (1.27%). Of the participants, 765 people (88.2%) worked on the frontline and had close contact with crowds, and 261 (20.8%) were administrative personnel. In terms of length of service, there were 246 employees who had worked for <5 years (28.37%), 205 employees who had worked for 5 to 10 years (23.64%), 231 employees who had worked for 10 to 20 years (26.64%), and more than 185 employees who had worked for 20 years (21.34%). Among them, 78 (9%) had prior work experience with two or more epidemics, 85 (9.8%) had experience with one epidemic, and 704 (81.2%) had no experience. There were 538 people (62.05%) who had participated in COVID-19-related training and 329 (37.95%) who had not participated in COVID-19-related training. Nearly all participants [799 (92.1%)] lived in Jiangsu Province, and 68 (7.9%) lived in the other 14 provinces. Quite a few respondents showed symptoms of depression [323 (37.25%)] and anxiety [330 (38.06%)]. Age, educational background, and years of work pointed to a significant statistical difference between symptoms of depression, whereas age and years of work experience were

TABLE 2 | Severity categories of depression and anxiety measurements in the total cohort and subgroups.

Severity category	Total No. (%)	Sex			Age					P-value
		No. (%)		P-value	No. (%)					
		Men	Women		≤24	25–29	30–34	35–39	≥40	
PHQ-9, depression symptoms										
Normal	544 (62.75)	258 (64.99)	286 (60.85)	0.241	68 (51.91)	65 (60.19)	85 (66.93)	102 (61.08)	224 (67.07)	0.019
Mild	232 (26.76)	100 (25.19)	132 (28.09)		42 (32.06)	28 (25.93)	30 (23.62)	50 (29.94)	82 (24.55)	
Moderate	66 (7.61)	24 (6.05)	42 (8.94)		17 (12.98)	7 (6.48)	11 (8.66)	13 (7.78)	18 (5.39)	
Severe	25 (2.88)	15 (3.78)	10 (2.13)		4 (3.05)	8 (7.41)	1 (0.79)	2 (1.20)	10 (3.00)	
GAD-7, anxiety										
Normal	537 (61.94)	244 (61.46)	293 (62.34)	0.676	70 (53.44)	58 (53.70)	81 (63.78)	116 (69.46)	212 (63.47)	0.02
Mild	295 (34.03)	134 (33.75)	161 (34.26)		54 (41.22)	44 (40.74)	41 (32.28)	45 (26.95)	111 (33.23)	
Moderate	23 (2.65)	11 (2.77)	12 (2.55)		5 (3.82)	3 (2.78)	5 (3.94)	5 (2.99)	5 (1.50)	
Severe	12 (1.38)	8 (2.02)	4 (0.86)		2 (1.52)	3 (2.78)	0 (0.00)	1 (0.60)	6 (1.80)	
Severity category	Total No. (%)	Educational background				P-value	Working position			P-value
		No. (%)					No. (%)			
		Bachelor degree	Junior college	Senior high school	Master degree		Second-line	Frontline		
PHQ-9, depression symptoms										
Normal	544 (62.75)	113 (53.55)	159 (58.03)	266 (71.70)	6 (54.55)	0.000	67 (65.69)	477 (62.35)	0.326	
Mild	232 (26.76)	64 (30.33)	78 (28.47)	86 (23.18)	4 (36.36)		29 (28.43)	203 (26.54)		
Moderate	66 (7.61)	28 (13.27)	22 (8.03)	15 (4.04)	1 (9.09)		6 (5.88)	60 (7.84)		
Severe	25 (2.88)	6 (2.85)	15 (5.47)	4 (1.08)	0 (0.00)		0 (0.00)	25 (3.27)		
GAD-7, anxiety										
Normal	537 (61.94)	118 (55.92)	172 (62.77)	240 (64.69)	7 (63.64)	0.156	69 (67.65)	468 (61.18)	0.125	
Mild	295 (34.03)	81 (38.39)	89 (32.48)	121 (32.61)	4 (36.36)		33 (32.35)	262 (34.25)		
Moderate	23 (2.65)	7 (3.32)	8 (2.92)	8 (2.16)	0 (0.00)		0 (0.00)	23 (3.01)		
Severe	12 (1.38)	5 (2.37)	5 (1.82)	2 (0.54)	0 (0.00)		0 (0.00)	12 (1.48)		
Severity category	Total No. (%)	Length of service				P-value	Marriage			P-value
		No. (%)					No. (%)			
		≤5y	5–10 y	10–20 y	≥20 y		Divorced	Single	Married	
PHQ-9, depression symptoms										
Normal	544 (62.75)	141 (57.32)	152 (74.15)	138 (59.74)	113 (61.08)	0.002	14 (73.68)	116 (58.29)	414 (63.79)	0.195
Mild	232 (26.76)	70 (28.46)	38 (18.54)	71 (30.74)	53 (28.65)		3 (15.79)	56 (28.14)	173 (26.66)	
Moderate	66 (7.61)	27 (10.98)	9 (4.39)	19 (8.23)	11 (5.95)		1 (5.26)	20 (10.05)	45 (6.93)	
Severe	25 (2.88)	8 (3.25)	6 (2.92)	3 (1.30)	8 (4.32)		1 (5.26)	7 (3.52)	17 (2.61)	
GAD-7, anxiety										
Normal	537 (61.94)	140 (56.91)	126 (61.46)	160 (69.26)	111 (60.00)	0.029	11 (57.89)	107 (53.77)	419 (64.56)	0.018
Mild	295 (34.03)	94 (38.21)	68 (33.17)	67 (29.00)	66 (35.68)		7 (36.84)	81 (40.70)	207 (31.90)	
Moderate	23 (2.65)	8 (3.25)	9 (4.39)	2 (0.87)	4 (2.16)		0 (0.00)	6 (3.02)	17 (2.62)	
Severe	12 (1.38)	4 (1.63)	2 (0.98)	2 (0.43)	4 (2.16)		1 (5.26)	5 (2.51)	6 (0.92)	

(Continued)

TABLE 2 | Continued

Severity category	Total No. (%)	Experiences				Trained		P-value
		No. (%)				No. (%)		
		≥2	0	1		No	Yes	
PHQ-9, depression symptoms								
Normal	544 (62.75)	50 (64.10)	445 (63.21)	49 (57.65)	206 (62.61)	338 (62.83)	0.905	
Mild	232 (26.76)	20 (25.64)	188 (26.70)	24 (28.24)	91 (27.66)	141 (26.21)		
Moderate	66 (7.61)	5 (6.41)	53 (7.53)	8 (9.41)	26 (7.90)	40 (7.43)		
Severe	25 (2.88)	3 (3.84)	18 (2.56)	4 (4.70)	6 (1.82)	11 (3.53)		
GAD-7, anxiety								
Normal	537 (61.94)	47 (60.26)	440 (62.50)	50 (58.82)	201 (61.09)	336 (62.45)	0.609	
Mild	295 (34.03)	29 (37.18)	236 (33.52)	30 (35.29)	112 (34.04)	183 (34.01)		
Moderate	23 (2.65)	1 (1.28)	20 (2.84)	2 (2.35)	13 (3.95)	10 (1.86)		
Severe	12 (1.38)	1 (1.28)	8 (1.13)	3 (3.53)	3 (0.91)	9 (1.67)		

the factors related to anxiety. Furthermore, the results showed that there was no difference between frontline and non-frontline workers, experienced and inexperienced individuals, or trained and untrained civil servants.

Comparison of the Severity of Measurements and Associated Factors

The PHQ-9 and GAD-7 scores showed a significant difference between different subgroups (Table 2). Younger individuals, well-educated workers, and those who were not middle-ranked for years of work experience reported more severe symptoms of depression, whereas younger individuals, divorced workers, and those who were not middle-ranked for years of work experience showed more severe symptoms of anxiety [e.g., severe depression among younger (25–29) vs. older individuals (≥40): 8 (7.41%) vs. 10 (3.00%); $P = 0.019$; severe anxiety among younger (25–29) vs. older individuals (≥40): 3 (2.78%) vs. 6 (1.80%); $P = 0.02$; severe depression among civil servants who were undergraduate vs. high school educated: 6 (2.85%) vs. 4 (1.08%); $P = 0.000$; severe depression among civil servants who worked ≥20 years vs. 5–10 years: 8 (4.32%) vs. 6 (2.92%); $P = 0.002$; severe anxiety among civil servants who worked ≥20 years vs. 5–10 years: 4 (2.16%) vs. 2 (0.98%); $P = 0.029$; and severe anxiety of civil servants who were divorced vs. married: 1 (5.26%) vs. 6 (0.92%); $P = 0.018$].

Comparison of the Scores of Measurements and Associated Factors

The median (IQR) scores on the PHQ-9 for depression and the GAD-7 for anxiety for all participants were 3.0 (1.0–6.0) and 4.0 (2.0–6.0), respectively. Consistently, participants who were younger, well-educated, and those who had fewer years of work experience had higher scores for both depression and anxiety [e.g., median (IQR) PHQ-9 scores among the younger (25–29) vs. the older participants (≥40): 3.0 (1.0–6.0) vs. 2.5 (0.0–6.0); $P = 0.008$; median (IQR) GAD-7 scores among the younger (25–29) vs. the older participants (≥40): 4.0 (3.0–6.0) vs. 4.0 (2.0–6.0); $P = 0.012$; median (IQR) PHQ-9 scores among civil servants who were undergraduates vs. high school educated: 4.0 (2.0–8.0) vs. 2.0 (0.0–5.0); $P = 0.000$; median (IQR) GAD-7 scores among civil servants who were undergraduate vs. high school educated: 4.0 (3.0–6.0) vs. 4.0 (2.0–6.0); $P = 0.021$; median (IQR) PHQ-9 scores among civil servants who worked ≤5 years vs. ≥20 years: 3.0 (1.0–8.0) vs. 3.0 (1.0–6.0); $P = 0.000$; and median (IQR) GAD-7 scores among civil servants who worked ≤5 years vs. ≥20 years: 4.0 (2.0–6.0) vs. 3.0 (1.0–6.0); $P = 0.041$]. However, no significant differences in working position, experience or not and training were noted for the scores of both depression and anxiety (Table 3) [e.g., median (IQR) PHQ-9 scores among experienced (≥2) vs. inexperienced (0): 3.0 (1.0–5.25) vs. 3.0 (1.0–6.0); $P = 0.857$; median (IQR) GAD-7 scores among experienced (≥2) vs. inexperienced (0): 4.0 (2.0–6.0) vs. 4.0 (2.0–6.0); $P = 0.961$; median (IQR) PHQ-9 scores among trained vs. untrained: 3.0 (0.0–6.0) vs. 3.0 (1.0–6.0); $P = 0.338$; and median (IQR) GAD-7 scores among trained vs. untrained: 4.0 (2.0–6.0) vs. 4.0 (2.0–6.0); $P = 0.478$].

TABLE 3 | Scores of depression and anxiety measurements in the total cohort and subgroups.

Scale	Total score median (IQR)	Sex			Age					
		Median (IQR)		P-value	Median (IQR)					P-value
		Men	Women		≤24	25–29	30–34	35–39	≥40	
PHQ9, depression symptoms	3.0 (1.0–6.0)	3.0 (1.0–6.0)	3.0 (1.0–6.0)	0.590	4.0 (2.0–8.0)	3.0 (1.0–6.0)	2.0 (0.0–6.0)	3.0 (1.0–6.0)	2.5 (0.0–6.0)	0.008
GAD7, anxiety symptoms	4.0 (2.0–6.0)	4.0 (2.0–6.0)	4.0 (2.0–6.0)	0.971	4.0(3.0–6.0)	4.0 (3.0–6.0)	4.0 (2.0–5.0)	3.0 (2.0–5.0)	4.0 (2.0–6.0)	0.012

Scale	Total score median (IQR)	Educational background				P-value	Working position			P-value
		Median(IQR)					Median (IQR)			
		Bachelor degree	Junior college	Senior high school	master degree	Second-Line	Frontline			
PHQ9, depression symptoms	3.0 (1.0–6.0)	4.0 (2.0–8.0)	3.0 (1.0–7.0)	2.0 (0.0–5.0)	3.0 (0.0–8.0)	0.000	3.0 (1.75–6.0)	3.0 (1.0–6.0)	0.433	
GAD7, anxiety symptoms	4.0 (2.0–6.0)	4.0 (3.0–6.0)	3.0 (1.75–6.0)	4.0 (2.0–6.0)	4.0 (2.0–6.0)	0.021	3.0 (2–5.0)	4.0 (2.0–6.0)	0.203	

Scale	Total score median (IQR)	Length of service				P-value	Marriage			P-value
		Median (IQR)					Median (IQR)			
		≤5 y	5–10 y	10–20 y	≥20 y	Divorced	Single	Married		
PHQ9, depression symptoms	3.0 (1.0–6.0)	3.0 (1.0–8.0)	2.0 (0.0–5.0)	3.0 (1.0–6.0)	3.0 (1.0–6.0)	0.000	2.0 (1.0–5.0)	3.0 (1.0–8.0)	3.0 (1.0–6.0)	0.179
GAD7, anxiety symptoms	4.0 (2.0–6.0)	4.0 (2.0–6.0)	4.0 (2.0–6.0)	3.0 (2.0–5.0)	3.0 (1.0–6.0)	0.041	3.0 (0.0–5.0)	4.0 (3.0–6.0)	4.0 (2.0–6.0)	0.029

Scale	Total score median(IQR)	Experiences				P-value	Trained		P-value
		Median (IQR)			Median (IQR)				
		≥2	0	1	No	Yes			
PHQ9, depression symptoms	3.0 (1.0–6.0)	3.0 (1.0–5.25)	3.0 (1.0–6.0)	3.0 (1.0–7.0)	0.857	3.0 (1.0–6.0)	3.0 (0.0–6.0)	0.338	
GAD7, anxiety symptoms	4.0 (2.0–6.0)	4.0 (2.0–6.0)	4.0 (2.0–6.0)	3.0 (1.5–6.0)	0.961	4.0 (2.0–6.0)	4.0 (2.0–6.0)	0.478	

TABLE 4 | Risk factors associated with depression and anxiety measurements in the total cohort and subgroups.

Variable	Adjusted OR (95%CI)		PHQ9 P-value		GAD7 P-value	
	PHQ9	GAD7	Category	Overall	Category	Overall
Sex						
Men	1 [Reference]	1 [Reference]	NA	0.031	NA	0.025
Women	1.385 (1.030–1.864)	1.014 (1.008–1.356)	0.031		0.025	
Age						
≤24	1 [Reference]	1 [Reference]		0.010	NA	0.021
25–29	0.503 (0.277–0.915)	0.740 (0.526–0.980)	0.024		0.035	
30–34	0.294 (0.142–0.611)	0.628 (0.310–0.971)	0.001		0.006	
35–39	0.323 (0.153–0.685)	0.465 (0.222–0.790)	0.003		0.001	
≥40	0.253 (0.117–0.546)	0.621 (0.298–0.998)	0.000		0.005	
Educational background						
Senior high school	1 [Reference]	1 [Reference]		0.001	NA	0.021
Junior college	1.753 (1.213–2.534)	0.790 (0.688–0.993)	0.003		0.045	
Undergraduate	2.157 (1.481–3.140)	1.432 (0.990–2.070)	0.000		0.056	
Graduate	2.064 (0.605–7.039)	1.243 (0.769–3.311)	0.247		0.327	
Working years						
≤5 y	1 [Reference]	1 [Reference]	NA	0.004	NA	0.002
5–10 y	0.616 (0.383–0.991)	1.041 (0.663–1.633)	0.046		0.063	
10–20 y	0.572 (0.266–1.257)	0.755 (0.457–0.947)	0.353		0.032	
≥20	0.411 (0.244–1.112)	0.773 (0.431–1.179)	0.292		0.314	

Risk Factors of Mental Health Outcomes

The results of the multivariable logistic regression analysis are presented in **Table 4**; after controlling for confounders, the variables of being women, being younger, having more education and having fewer years of work experience were associated with severe symptoms of depression and anxiety. In comparison with men, women were associated with more severe symptoms of depression [odds ratio (OR), 1.385; 95% confidence interval (CI), 1.030–1.864; $P = 0.031$] and anxiety (OR, 1.014; 95% CI, 1.008–1.356; $P = 0.025$). The younger participants were associated with a higher risk of feeling distressed (OR, 0.253; 95% CI, 0.117–0.546; $P = 0.000$) and anxious (OR, 0.621; 95% CI, 0.298–0.998; $P = 0.005$) than the older participants. Compared with participants with a high school diploma, those with a college degree appeared to be vulnerable to depression disorders (OR, 2.157; 95% CI, 1.481–3.140; $P = 0.000$). Compared with participants with fewer years of work experience, those with longer years of work experience were associated with severe symptoms of depression (OR, 0.616; 95% CI, 0.383–0.991; $P = 0.046$) and anxiety (OR, 0.755; 95% CI, 0.457–0.947; $P = 0.032$).

DISCUSSION

Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest (13). The exact cause of depression is unknown. It may be caused by a combination of genetic, biological, environmental, and psychological factors (13). In general, ~1 out of every 6 adults will have depression at some time in their life (14). Symptoms of depression and anxiety often co-occur in certain disorders (15). In fact, it has been

estimated that 45 percent of people with one mental health condition meet the criteria for two or more disorders (15). Since the outbreak of COVID-19, increasing studies have shown that this epidemic has a negative impact on the psychology of the general public, and anxiety and depression are the most common mental problems (16–18). In addition, according to the pharmacy benefit management organization Express Scripts, the largest spike was in prescriptions for anti-anxiety drugs, which rose 34.1 percent from mid-February to mid-March 2020, followed by prescriptions for antidepressants that ticked up by 18.6 percent, which also reflect the increase in the incidence of anxiety and depression (19). To date, there have been many reports on the mental stress of medical staff or the public, but there have been few reports on civil servants. Thus, we conducted this study to examine the impact of the COVID-19 pandemic on the prevalence of symptoms of depression and anxiety and the corresponding risk factors among public servants.

This survey enrolled 867 respondents and revealed a high prevalence of mental health symptoms among civil servants during the COVID-19 outbreak in China. Overall, 37.25 and 38.06% of all participants reported symptoms of depression and anxiety, respectively. Respondents who were younger and well-educated and those who had fewer years of work experience had higher scores for both depression and anxiety. Multivariable logistic regression analysis showed that being younger, being a woman, having more education and having fewer years of work experience were associated with severe depression and anxiety. However, the results of the study imply that there is no difference between frontline and non-frontline workers both in depression and anxiety severity among civil servants. This

finding suggests that, due to the heavy workload, a large number of civil servants were recruited to the frontline, and the ratio of frontline to second-line personnel may reach 5 to 1 or more, resulting in a reduction in the number of second-line personnel who must perform the tasks that have not been reduced. Thus, both the decreased number of staff and increased tasks caused their workload to rise sharply, leading to the development of the same level of symptoms of both depression and anxiety among frontline and non-frontline workers. These results reached the same conclusion as a previous study (17), indicating that not only frontline nurses but also non-frontline nurses suffered from mental problems. Consistently, during the 2015 MERS outbreak, a study conducted among workers in hospitals reported that not only medical staff who performed MERS-related tasks but also most hospital administrators were reported to be at risk for mental disorders, even after time had elapsed (9).

Judging from the results of whether civil servants had experience or received COVID-19-related training in combating infectious diseases, there was no significant difference between experienced and inexperienced individuals in symptoms of depression or anxiety. This finding may be associated with the fact that the spread rate and impact range of this pandemic are much greater than those of severe acute respiratory syndrome (SARS) in 2003 (20), bringing unimaginable workloads for public officials. Even for responders with experience in administering to public health emergencies, contending with COVID-19 is still a difficult endeavor. Suddenly increased work stress, countless tasks and instructions, fear about the disease, and overwhelming news reports can all cause mental illness in civil servants (21). Furthermore, it has been demonstrated that the presence of both depression and anxiety is common, and working long hours could be a risk factor for the development of depressive and anxiety symptoms, especially in women (6, 22–27). As the epidemic occurred during the Spring Festival, the migration of travelers returning home was extremely fast and widespread, which also increased the difficulty of disease control and increased the workload of civil servants. In addition, although many departments at the state and regional levels have set up COVID-19-related courses, there are few training opportunities on mental health and psychological support. Finally, all of the above factors worked together and eventually led to mental illness.

To address COVID-19, China has taken active and effective strategies to support the prevention and control of the epidemic and has adopted a strict prevention and control system, mobilizing a large number of civil servants to participate in these actions, which have been proven to be highly effective. According to the reports, no new cases in Wuhan were reported for 14 days continuously; thus, with the approval of the Hubei Provincial Government, Wuhan, which is the original place of the outbreak, the road blockade was lifted at 0:00 on April 8, 2020. Compared to many other occupations in China, civil servants are more susceptible to various psychosocial pressures, such as responsibilities, overworking, fierce competition, and complicated interpersonal relationships (28, 29). As a result, they often suffer from psychological problems under high pressure, especially young civil servants, among whom the prevalence of

psychiatric symptoms has risen markedly (28–30). Meanwhile, they are also at high risk of psychological distress when exposed to non-cooperation or even violence in the course of managing various issues and interacting with different individuals (31).

How can these workers be helped? Mental health practitioners should carry out psychiatric interventions as early and timely as possible to deal with the outbreak of these severe infectious diseases (32, 33). Prompt and continuous psychological interventions may be beneficial for the mental health of civil servants during high mortality infectious disease outbreaks (21). Civil servants should be provided with more support programs to address the subsequent impact of this severe epidemic. Those most liable to suffer from serious mental illness include women, people of younger age, individuals with more education and individuals with fewer years of job experience. Importantly, these groups require particular attention.

In summary, this study suggests that during the period of the COVID-19 pandemic spread and control, civil servants suffer from depression and anxiety according to varying levels, presenting concerns about the psychological status of civil servants involved in the recent COVID-19 outbreak in China. These findings may improve the understanding of mental health status and various stressors in civil servants and provide a theoretical basis and feasible strategy for future work. Therefore, early recognition of mental disorders and psychological stress, including depression and anxiety in civil servants, can promote the prevention, control, and treatment of COVID-19.

This study is a descriptive and cross-sectional study that is unable to explore the causal relationship between factors. Therefore, it is necessary to conduct longitudinal large-scale intervention studies and recruit more civil servants to further explore the pathogenesis, treatment strategies, and mechanisms of depression and anxiety.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the clinical research ethics committee of the First Affiliated Hospital of Zhejiang University. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements. Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

LL designed the study. QH and BZ supervised data collection and data management. QH and XH analyzed the data. QH prepared the first draft of the manuscript. All authors wrote the paper, had

access to the study data, and have reviewed and approved the final manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.601791/full#supplementary-material>

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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