The Negative Mental Health Condition among Different Occupational Group in Shaanxi Province of China during the COVID-19 Pandemic

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Abstract— During the COVID-19 pandemic in China, people with different backgrounds may have different negative mental health conditions. Pay attention to the negative mental health condition of the medical staff, college students, and industry workers are necessary during this period. This study is a cross-sectional study. Data was collected using the non-probability method through wenjuanxing to distribute questionnaires and the participants fill in the questionnaire online. This study found that there was no significant difference in depression condition among medical staff, college students, and industry workers in Shaanxi province (F = 0.143, P = 0.87); there was no significant difference in anxiety condition among medical staff, college students, and industry workers in Shaanxi province (F = 0.043, P = 0.96); there was no significant difference in stress condition among medical staff, college students, and industry workers in Shaanxi province (F = 1.48, P = 0.29); there was a significant difference between male and female depression condition (t = 6.1, p <0.01); there was a significant difference between male and female anxiety condition (t = 6.13, p <0.01); there was a significant difference between male and female stress condition (t = 6.07, p <0.01). According to this study found that men were more likely than women to experience depression, anxiety, and stress during the COVID-19 pandemic in China.

Index Terms—*COVID-19, Depression, Anxiety, Stress, China*

I. INTRODUCTION

At the end of 2019, a new type of coronavirus pneumonia (COVID-19) broke out in Wuhan city, which is the capital city of Hubei Province in China [1]. The World Health Organization (WHO) declared the COVID-19 as a "public health emergency of international concern" On January 30, 2020, [2]. Emergency events such as natural disasters include earthquakes, plagues, fires, and human-made disasters include wars and terrorism that always make people feel tension, anxiety, and other negative emotions to breed. These emergencies will have a specific impact on people's psychology. In the early stages of the SARS outbreak in 2003, many mental disorders appeared one after another, including cognitive problems such as persistent depression, anxiety, and stress [3]. The coronavirus is highly infectious and has a fatality rate of about 4% in China [4]. Because of the high risk of infection, people must have anxiety and mental distress during the COVID-19 pandemic in China.

To reduce the infection rate of the COVID-19, the Chinese government imposed shut down Wuhan city on January 23, 2020. Other Chinese cities start to implement strict personnel management on January 25, 2020, which included prohibiting people exposed in crowded places, and it effectively reduces the risk of people infected by COVID-19. Shaanxi province is the neighboring province of Hubei Province, which has convenient transportation from Hubei province. To prevent the spread of COVID-19 in Shaanxi Province, the Shaanxi Provincial Government implement a first-level emergency response to public health emergencies on January 25, 2020. During the COVID-19 pandemic in China, the Chinese government track and contacts who visited Wuhan increased people's anxiety and panic.

Different people have different educational backgrounds and professional knowledge that may have different psychological reactions during the COVID-19 pandemic in China. As the leading force in the fight against the coronavirus who takes care of patients, medical staff deserves more respect and understanding from citizens [5]. Therefore, it is necessary to pay attention to the medical staff's psychological conditions in this particular period. The group of college students is unique because they are young, healthy, and they like socializing. During the COVID-19 pandemic, college students lose face-to-face connections and traditional activities, which is a stressful phenomenon [6]. It is necessary to pay attention to college students' psychological conditions in Shaanxi Province during the COVID-19 pandemic. Simultaneously, workers in industries as an essential group in our society. During COVID -19 pandemic, industry workers return to work after three weeks self-isolation, and that makes workers face the large-scale infection events cause new work stress due to the epidemic situation [7]. Thus, industry workers may have more pressure and stress during COVID-19 pandemic in China. No study has focused on the negative mental health conditions related to medical staff, college students, and industry workers during COVID-19 pandemic in China. This study explores and analyzes the negative mental health conditions (include depression, anxiety, and stress) of medical staff, college students, and industry workers in Shaanxi Province during COVID-19 pandemic in China.

II. METHODS

Study Design

A cross-sectional study was conducted from February 23, 2020 to March 7, 2020 among medical staff, college students, and workers in industries in Shaanxi Province.

The Medical Research Ethics Committee approved this study of Jining Medical College (Ethics number: JNMC-2020-KY-001), and all respondents have written consent.

Data collection and instrument

Data was collected using the non-probability method through wenjuanxing (www.wenjuanxing.com) to distributed questionnaires to participants online, and the questionnaires were filled out by participants voluntarily. Participants must be able to speak Mandarin. All the participants were above 18 years and signed the informed consent approving the use of their data for research purposes.

The questionnaire consists of two parts. The first part is the general personal information, such as gender, ethnicity, occupation, etc.; the second part is the Chinese Simplified version of the Depression and Anxiety Scale (Chinese Short version of Depression Anxiety and Stress Scale, DASS-21) [8]. The DASS-21 includes three subscales for depression, anxiety, and stress, and each subscale contains seven questions. The 21 items included in the scale describe the participants who have had symptoms of depression, anxiety, and stress in the past week. A previous study had improved that DASS-21 had good construct validity and content validity [8–10].

Data analysis

All the responses were automatically saved in the Microsoft Excel file. The Excel data were imported to IBM SPSS 25.0 statistical software to perform statistical description and analysis. This study uses descriptive statistics, independent sample t-test, ANOVA, and correlation analysis of the mental health condition among medical staff, college students, and workers in industries in Shaanxi Province during the COVID-19 pandemic. The statistical test level is $\alpha = 0.05$, a two-sided test.

III. RESULT

Demographic characteristic

A total of 1995 questionnaires were collected in this study, and 85 invalid questionnaires were excluded. The effective rate of collected questionnaires was 95.7%. Among them, 719 were male questionnaires (37.6%), female questionnaires 1190 (62.4%); medical staff questionnaires were 280 (14.7%), college student questionnaires were 1278 (66.9%), and questionnaires from the worker in industries were 351 (18.4%). The average age of medical staff is 32.63±0.461 years, the average age of college students is 20.41±0.59 years, and the average age of workers in industries is 39.3±0.575 years.

The negative mental health condition among medical staff, college students, industry workers in Shaanxi Province

The mental health condition among medical staff, college students, workers in the industry in Shaanxi province were measured by the DASS-21 scale (as shown in Table 1). According to this research found 58 (20.7%) medical staff had depression symptoms, 57 (20.4%) medical staff had anxiety symptom, 27 (10.8%) medical staff had stress symptoms; 280 (21.9%) college students had depression symptoms, 270 (21.2%) college students had anxiety symptoms, 138 (10.8%) college students had stress symptoms; 78 (22.1%) workers in industry had depression symptoms, 74 (21.6%) workers in industry had anxiety symptoms, 40 (11.4%) workers in industry had stress symptoms,

Table 1 The mental health condition among different occupational group in Shaanxi Province.

Mental health condition		College student	Medical staff	Industry worker
		group		
Depression				
	normal	998（78.1）	222（79.3）	273（77.8）
	mild	96（7.5）	28（10.0）	35（10.0）
	moderate	123（9.6）	19（6.8）	28（8.0）
	severe	31（2.4）	7（2.5）	6（1.7）
	extremely severe	30（2.3）	4（1.4）	9（2.6）
Anxiety				
	normal	1008（78.9）	223（79.6）	276（78.6）
	mild	55（4.3）	14（5.0）	11（3.1）
	moderate	122（9.5）	26（9.3）	39（11.1）
	severe	29（2.3）	6（2.1）	12（3.4）
	extremely severe	64（5.0）	11（3.9）	13（3.7）
Stress				
	normal	1140（89.2）	253（90.4）	311（88.6）
	mild	49（3.8）	12（4.3）	14（4.0）
	moderate	47（3.7）	9（3.2）	15（4.3）
	severe	37（2.9）	5（1.8）	9（2.6）
	extremely severe	5（0.4）	1（0.4）	2（0.6）

The relationship of the negative mental health condition among medical staff, college students, the worker in industries in Shaanxi Province

The mental health condition among medical staff, college students, industry workers in Shaanxi province was analyzed by ANOVA. The analysis result was p>0.05, which means that the mental health condition among medical staff, college students, and industry workers in Shaanxi province was not statistically significant (as shown in Table 2). Therefore, there was no significant difference in mental health conditions among medical staff, college students, industry workers in Shaanxi province during the COVID-19 pandemic.

Table 2 The relationship of the negative mental health condition among medical staff, college students, industry workers in Shaanxi province.

	Group	X±SD	95%CI	F	P
Depression	College student(n=1278)	5.29±0.20	（4.89，5.67）	0.143	0.87
	Medical staff(n=280)	6.21±0.42	（4.36，5.87）		
	Industry worker (n=351)	6.25±0.39	（4.40，5.79）		
Anxiety	College student (n=1278)	6.55±0.18	（3.90，4.61）	0.043	0.96
	Medical staff (n=280)	6.15±0.37	（3.41，4.85）		
	Industry worker (n=351)	6.46±0.34	（3.57，4.92）		
Stress	College student (n=1278)	5.62±0.21	（5.21，6.02）	1.48	0.29
	Medical student (n=280)	6.21±0.42	（5.39，7.03）		
	Industry worker (n=351)	6.25±0.39	（5.46，7.03）		

The relationship between gender and mental health condition among medical staff, college students, industry workers in Shaanxi province

This study uses an independent sample t-test analysis the relationship between gender and mental health condition among medical staff, college students, industry workers in Shaanxi province. This study found males have had a higher risk had depression, anxiety, and stress symptoms than females (p<0.01) (as shown in table 3).

Table 3 Psychological symptoms of occupational groups of different genders

	Depression	Anxiety	Stress
Male	6.46±8.25	5.4±7.45	7.12±8.5
Female	4.48±5.88	3.54±5.28	5.04±6.36
t	6.1	6.13	6.07
95%CI	（1.34，2.62）	（1.26，2.51）	(1.4，2.75)
P	<0.01	<0.01	<0.01

Correlation of the negative mental health condition among medical staff, college students, industry workers in Shaanxi province

The results of the correlation analysis are shown in table 4. This study found there was a significant negative correlation between gender and groups of population in Shaanxi province (r=-0.065, p<0.001); there was negative correlation between gender and depression (r= -0.127, p <0.001); there was negative correlation between gender and anxiety (r=-0.116, p <0.001); there was negative correlation between gender and stress symptoms (r=-0.120P<0.01); there was no apparent correlation in groups of depression, anxiety and stress; there was positive correlation between depression and anxiety (r=0.779, p<0.001); there was positive correlation between depression and stress (r=0.620, p<0.01). Therefore, this study found that gender is an important factor in people's mental health conditions, and different groups have no significant difference in people's mental health conditions.

Table 4. Correlation matrix of gender and mental health condition among medical staff, college students, industry workers in Shaanxi Province.

	1	2	3	4	5
1. gender	1				
2.groups：	-.065**	1			
3.depression	-.127**	-0.008	1		
4.anxiety	-.116**	-0.002	.779**	1	
5.stress	-.120**	0	.620**	.660**	1

**p<0.01.

IV. DISCUSSION

During the COVID-19 pandemic in China, the negative mental health condition among medical staff, college students, and industry workers may be different with each other. The three diverse groups have different educational backgrounds; the different working environments may experience various mental health conditions. Due to the sudden and accidental nature of the pandemic in history, there are a few studies on the impact of negative mental health conditions caused by public health among different groups. This is the first comprehensive analyzing difference in negative mental health among medical staff, college students, and industry workers in Shaanxi province during the COVID-19 pandemic in China. The negative mental

health condition was measured by DASS-21, with results demonstrating observable differences regarding gender. We also found that the mean scores of depression, anxiety, and stress in different gender groups show that males are more likely to experience depression, anxiety, and stress symptoms than females. In previous studies had reported the prevalence of depression is higher in females than in the male. Their findings also showed the similar depression prevalence ratios of females: males in developed countries and globally suggested that the different risk may primarily stem from biological sex differences and depend less on race, culture, education, and economic factors [11]. Another study also found that females often experience too many negative emotions during their body functions become worse [12]. In contrast, this study found males are more likely to experience negative emotions than females, which may be caused by psychological and social support [7]. There is more invisible pressure on males, and they should take more responsibility in society. Male can't express their emotions as females, which has a higher risk of negative mental health than females. Therefore, people should pay more attention to the negative mental health of males during the COVID-19 pandemic.

Table 4 showed that the negative mental health conditions among medical staff, college students, and industry workers in Shaanxi province did not differ statistically. Because of the establishment of scientific prevention COVID-19 methods, people have efficient information to protect themselves during the COVID-19 pandemic in China. The negative mental health condition among medical staff, college students, and industry workers did not differ in this study. Since this study survey the negative mental health condition of people in a particular period, people have different levels of negative mental health conditions during the COVID-19 pandemic. It is necessary to implement methods to relieve people's anxiety, depression, and stress as soon as possible, such as spreading knowledge about epidemics and prevention through media science not to make people feel excessive panic.

CONCLUSION

This study found the negative mental health condition among medical staff, college students, and industry workers in Shaanxi province during the COVID-19 pandemic in China. Through this research, we find that males are more likely to experience depression, anxiety, and stress than females during the COVID-19 epidemic in China. Therefore, the male population should give more psychological guidance and mental health education.

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