



ORIGINAL ARTICLE

# Effects of the COVID-19 pandemic on acute stress disorder and career planning among healthcare students

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**ABSTRACT:** This study aimed to investigate the effects of COVID-19 on the prevalence of acute stress disorder and subsequent effects on career planning among healthcare students. A cross-sectional survey was conducted among 1158 healthcare students across five medical universities in February 2020. Acute stress disorder was assessed using the Stanford Acute Stress Response Questionnaire. Further data regarding COVID-19 knowledge, individual behaviours, occupational choices, and career planning were collected. Based on the results of the Stanford Acute Stress Response Questionnaire, the students were divided into high-risk and low-risk groups for acute stress disorder. The correlation between acute stress disorder and the impact on career planning was analysed. The high-risk group comprised 143 (12.3%) participants, while 1015 (87.7%) participants were in the low-risk group. Two factors increased the risk of acute stress disorder in the students, including 'I think the pandemic is far away from me' (B: 1.27, 95%CI: 1.60–7.87) and 'Physical contact with confirmed or suspected cases' (B: 2.49, 95%CI: 3.42–42.44). Those who obtained pandemic information from official media sources indicated a lower risk of acute stress disorder (B: –0.24, 95%CI: 0.49–1.26). The high-risk group was more likely to quit the medical profession after graduation. The COVID-19 pandemic may cause acute stress disorder among healthcare students and affect their career planning. Universities and relevant departments should provide more information and moral support for these students.

**KEY WORDS:** acute stress disorder, career planning, COVID-19, healthcare students, mental health.

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## INTRODUCTION

The coronavirus disease 2019, or COVID-19, has become a worldwide public health threat. By 13 June 2020, 7.66 million cases of COVID-19 were recorded globally (JHUM 2020). Public health emergencies, such as the severe acute respiratory syndrome outbreak in 2003 (Chowell *et al.* 2015), the Middle East respiratory syndrome epidemic in 2012 (Kucharski & Althaus 2015), the ebola epidemic in 2014 (Breban, Riou, & Fontanet 2013), and the current COVID-19 pandemic pose serious threats to human physical and mental

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health. The sudden, destructive, complex, and persistent nature of health emergencies can cause people to experience immense psychological stress, which often leads to anxiety, insomnia, and other mental disorders (Dubey, Biswas, Ghosh, Chatterjee, & Lavie 2020).

In recent years, the mental health issues experienced by college students have garnered much attention (Yang, Zhang, Sun, Sun, & Ye 2015). Additionally, previous research indicates that COVID-19 may be a significant stressor which causes physiological and psychological problems, behavioural disorders, and cognitive attitude changes (Su 2005). Recent assessments of college student mental health in China have shown an increased level of anxiety and depression in the wake of the pandemic (Chang 2020; Zhong 2020). Another cross-sectional survey in the United States found that, among the 2031 college students, 18.04% even had suicidal thoughts (Ma *et al.* 2020). Earlier studies show that the negative impact of epidemic/pandemic on the mental health is higher in healthcare workers (Lee, Kang, Cho, Kim, & Park 2018; Lu, Shu, Chang, & Lung 2006). The mental health of medical students also was found to be even poorer, when compared to general population (Bergmann *et al.* 2019). In a descriptive study conducted during COVID-19 pandemic, 44.1% of medical students showed a sense of being emotionally detached from family, friends, and fellow students (Meo, Abukhalaf, Alomar, Sattar, & Klonoff 2020). ASD is a common stress reaction occurring in the initial month following exposure to a traumatic event (Bryant 2018). A cross-sectional and nation-wide survey conducted in China among college students showed that the prevalence rates of probable acute stress was 34.9% (Ma *et al.* 2020). However, the prevalence of acute stress disorder (ASD) during COVID-19 has not been addressed among healthcare students. If ASD is not detected and treated timely, it may develop into more severe post-traumatic stress disorder (PTSD) (Bryant 2010).

Career planning refers to make education, training and development plans by analysing, summarizing and evaluating subjective or objective factors, so as to achieve personal goal (You 2014). A small sample study conducted among South Korea nursing students found that almost all participants decided to leave the nursing profession due to the COVID-19 pandemic (Santos 2020). Another study also found that the COVID-19 pandemic had left a huge impact on the career perceptions of medical students globally (Ooi & Ooi 2020).

Unfortunately, only limited studies were done on the impact of pandemic on the career planning of medical students.

Therefore, this study aims to investigate the prevalence of ASD and its potential influence on career planning during the COVID-19 pandemic among healthcare students. In our study, 'healthcare students' refers to students majoring in medical science, their courses include nursing, clinical medicine, Stomatology, intelligent medical engineering, optometry, geriatric health care, and health management.

## METHOD

### Participants

The sample was recruited in February from four regions and five universities across China using convenience sampling methods. The samples were distributed in the northeast and southwest of China. The types of university were college diploma and undergraduate school. The survey was open from February 18 to February 26. Inclusion criteria were healthcare students with no cognitive impairment or language and communication barriers. Exclusion criteria were the presence of pre-existing mental health conditions, a history of trauma or sleep dysregulation, and confirmed or suspected cases of COVID-19. As per national policy, physical distancing was implemented to curb disease transmission. Therefore, online surveys were conducted. Recruitment information for the cross-sectional survey was posted online via the WeChat push and WeChat moments apps. A sample of 1158 healthcare students meeting the research criteria voluntarily participated in the survey. Participants were able to complete the questionnaire using any Internet-enabled device. To avoid repeated submissions, each account, device, and IP address could only submit responses once. Professional questionnaire software was used to generate questionnaire links. All questions were set as required to ensure the integrity of the questionnaire.

### Measurements

The research group designed the first part of the survey according to the research purpose. It comprised questions on participants' demographic information, including gender, political status, and educational background.

### Stanford Acute Stress Reaction Questionnaire (SASRQ) – Chinese version

The Stanford Acute Stress Reaction Questionnaire (SASRQ) is commonly used in the assessment of Acute Stress Disorder (ASD). It comprises 30 items divided into 5 subscales as follows: the traumatic event experience (6 items), the avoidance of a traumatic event (6 items), dissociative symptoms (10 items), social functioning impairment (2 items), and irritability symptoms (6 items). The frequencies of experiences are rated on a Likert scale ranging from 0 to 5, where 0 represents 'never' and 5 represents 'always'. The total score achievable is 150 points. The higher the score, the higher the risk of developing ASD. Scores  $\geq 40$  suggest a high risk of ASD. The total score of each item can reflect the severity of ASD. Cronbach's alpha of each subscale is between 0.72 and 0.88, indicating that the scale has good reliability and validity (Cardena, Koopman, Classen, Waelde, & Spiegel 2010). It has further been validated in the Chinese population (Wen *et al.* 2011; Yang *et al.* 2015). In this study, Cronbach's alpha of the entire scale was 0.952, and Cronbach's alphas of the five subscales were 0.808, 0.858, 0.884, 0.677, and 0.814, respectively.

### COVID-19-related knowledge and cognitive-behavioural factors

The next section of the survey was related to COVID-19. It comprised cognitive factors (information sources and prevention knowledge); history of epidemiology (physical contact with suspected or confirmed coronavirus cases, individual and family symptoms); attitudes (concerns regarding the progress and containment of the pandemic, feelings of unease when going out or making contact with others, etc.); and preventive behaviours (reducing outings). Except for the question regarding information sources, all questions were rated on a 5-point Likert scale. Responses included 'strongly disagree', 'disagree', 'neutral', 'agree', and 'strongly agree'.

### Career development planning questionnaire

The items for this section of the survey were determined by a close review of the literature (Cheng 2014) and the research purposes of this study. This section comprised eight items. Questions included employment objectives, such as 'Where do you see yourself academically and professionally in the next three to five

years?'; 'Do you know your employment goals?'; and 'Have you ever participated in a curriculum or attended lectures regarding career planning?'. Participants also responded to statements such as 'After the COVID-19 pandemic, I will no longer work in the medical profession', and 'After the COVID-19 pandemic, my family will not agree with me pursuing a career in healthcare'.

### Data analysis

The data generated by the questionnaire platform were imported into and analysed using IBM SPSS Statistics for Windows, version 20.0. The measurement data were expressed by mean and standard deviation, and the counting data were expressed by frequency and percentage. Comparison between groups was conducted via independent sample t-test. Count data were analysed by chi-square test. Influencing factors were determined using logistic regression analysis, and significance level was set at  $P = 0.05$ .

## RESULTS

### Distribution of SARSQ Scores

Based on scores obtained from the SASRQ, participants were divided into high-risk and low-risk groups for ASD. There were 143 participants (12.3%, score  $\geq 40$ ) in the high-risk group and 1015 participants (87.7%, score  $< 40$ ) in the low-risk group (see Figure 1).

### Demographic characteristics

Among the 1158 healthcare students, there were 1132 nursing students, 19 medical students, and 7 students from other faculties. There was no significant

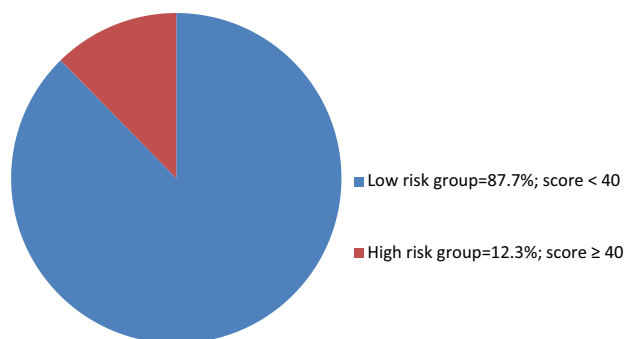


FIG. 1 Distribution of SARSQ scores among healthcare students.

difference in demographic data between the ASD high-risk and low-risk groups, as shown in Table 1.

### SASRQ scores and symptom scores for the ASD high-risk and low-risk groups

Significant differences were indicated in SASRQ total scores and symptom dimension scores between the two groups ( $P < 0.001$ ), as shown in Table 2. No significant differences in SASRQ total score and symptom scores of each dimension were found in relation to gender, educational background, and other socio-demographic characteristics ( $P > 0.05$ ).

### Comparison of COVID-19 cognitive-attitudes-preventive behaviours between ASD high-risk and low-risk groups

For healthcare students, having ASD may influence their cognition, attitudes, and behaviours regarding the

**TABLE 1** Socio-demographic characteristics of students in low-risk and high-risk groups

Characteristics	Low-risk group ( <i>n</i> = 1015)	High-risk group ( <i>n</i> = 143)	$\chi^2$	<i>P</i>
Gender			0.01	0.86
Male	71 (7%)	9 (6.3%)		
Female	944 (93%)	134 (93.7%)		
Political Affiliation			0.01	0.76
Party member	20 (2%)	3 (2.1%)		
Non-party member	995 (98%)	140 (97.9%)		
Education			5.15	0.17
Junior college	642 (63.3%)	90 (62.9%)		
Undergraduate	364 (35.9%)	52 (36.4%)		
Master's degree	9 (0.9%)	0		
Doctoral student	0	1 (0.7%)		
Enrolment time			0.20	0.66
One year	16 (1.6%)	1 (0.7%)		
>One year	999 (98.4%)	142 (99.3%)		
Place of residence			0.63	0.43
Urban residence	645 (63.5%)	86 (60.1%)		
Rural residence	370 (36.5%)	57 (39.9%)		
Only child			0.02	0.92
Yes	283 (27.9%)	39 (27.3%)		
No	732 (72.1%)	104 (72.7%)		

Junior college: College diploma.

prevention of COVID-19. Results indicate that participants in the ASD high-risk group were more likely to obtain COVID-19 prevention knowledge from unofficial media sources, and their awareness rate was lower than the low-risk group. Moreover, participants in the ASD high-risk group were exposed to more confirmed or suspected COVID-19 cases, and the incidence of catarrh (fever, cough, diarrhoea, and other symptoms) was higher than in the low-risk group. Compared with the low-risk group, participants in the high-risk group paid less attention to the pandemic and went out more often. As shown in Table 3.

### Analysis of the causes of acute stress disorder

Acute stress disorder was the dependent variable. Participants' time of enrolment, sex, education level, place of residence, and significant influences of COVID-19 on students' knowledge and behaviours were the independent variables. Logistic regression analysis indicated that two potential factors increased the risk of ASD, including 'I think the pandemic is far away from me' (B: 1.27, 95%CI: 1.60–3.87), and 'Physical contact with confirmed or suspected cases' (B: 2.49, 95%CI: 3.42–42.44). Furthermore, those who obtained pandemic-related information from official media sources showed a lower risk of ASD (B: -0.24, 95%CI: 0.49–1.26). As shown in Table 4.

### Comparison of career development planning between the ASD high-risk and low-risk groups

As shown in Table 5, ASD may affect the career planning of healthcare students. Compared with the ASD high-risk group, the participants in the low-risk group were more likely to perceive that their study major was related to their preferred occupation, knew more about their future 3–5-year plans, and were certain of their employment direction and career plans. However, the high-risk group participants were more likely to leave the medical profession after graduation.

## DISCUSSION

### The COVID-19 pandemic may cause acute stress disorder among healthcare students

This study aimed to investigate the effects of COVID-19 on the prevalence of acute stress disorder and

**TABLE 2** Comparison of total SASRQ scores and symptom scores between ASD high-risk and low-risk groups

Group	N	Separate	Re-experience	Avoid	Agitation	Social function impairment	Total score
High-risk group	143	16.42 ± 4.948	3.649 ± 4.031	11.97 ± 4.542	13.90 ± 3.863	3.57 ± 1.848	59.14 ± 14.736
Low-risk group	1015	2.88 ± 3.649	2.86 ± 2.222	2.48 ± 2.166	4.95 ± 3.880	0.48 ± 0.994	13.77 ± 11.170
<i>t</i> -value		39.55	41.838	41.198	25.824	30.504	43.534
<i>P</i> -value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

**TABLE 3** Comparison of COVID-19 cognitive-attitudes-preventive behaviours between the ASD high-risk and low-risk groups

Responses	High-risk group ( <i>n</i> = 143)	Low-risk group ( <i>n</i> = 1015)	$\chi^2$	<i>P</i>
<b>Cognition</b>				
Information sources			24.86	<0.001
Unofficial media	30 (21%)	159 (15.7%)		
Official media	106 (74.1%)	847 (83.4%)		
Other	1 (0.7%)	5 (0.5%)		
Community publicity	6 (4.2%)	4 (0.4%)		
I am aware of COVID-19 and its related preventive knowledge			11.96	0.02
Strongly disagree	4 (2.8%)	7 (0.7%)		
Disagree	9 (6.3%)	37 (3.6%)		
Neutral	46 (32.2%)	291 (28.7%)		
Agree	71 (49.7%)	518 (51.0%)		
Strongly agree	13 (9.1%)	162 (16.0%)		
<b>Epidemiology</b>				
Physical contact confirmed or suspected cases (COVID-19)			44.87	<0.001
Yes	12 (8.4%)	6 (0.6%)		
No	131 (91.6%)	1009 (99.4%)		
My family and I have fever, cough, diarrhoea and other symptoms.			11.88	<0.001
Yes	5 (3.5%)	4 (0.4%)		
No	138 (96.5%)	1011 (99.6%)		
<b>Attitude</b>				
I am very concerned about the real-time progress of epidemic prevention and control.			9.60	0.04
Strongly disagree	3 (2.1%)	5 (0.5%)		
Disagree	5 (3.5%)	21 (2.1%)		
Neutral	28 (19.6%)	159 (15.7%)		
Agree	72 (50.3%)	497 (49%)		
Strongly agree	35 (24.5%)	333 (32.8%)		
I think the pandemic is far away from me.			18.46	<0.001
Strongly disagree	56 (39.2%)	529 (52.1%)		
Disagree	38 (26.6%)	255 (25.1%)		
Neutral	34 (23.8%)	197 (19.4%)		
Agree	12 (8.4%)	27 (2.7%)		
Strongly agree	3 (2.1%)	7 (0.7%)		
I am worried about the control of the pandemic.			8.69	0.07
Strongly disagree	4 (2.8%)	56 (5.5%)		
Disagree	10 (7.0%)	92 (9.1%)		
Neutral	49 (34.3%)	55 (5.5%)		
Agree	62 (43.4%)	331 (32.6%)		
Strongly agree	18 (12.6%)	181 (17.8%)		
I am nervous about my relatives and friends visiting my home.			3.19	0.53
Strongly disagree	7 (4.9%)	79 (7.8%)		
Disagree	8 (5.6%)	73 (7.2%)		
Neutral	60 (42%)	367 (36.2%)		
Agree	42 (29.4%)	318 (31.3%)		

(Continued)

**TABLE 3** (Continued)

Responses	High-risk group (n = 143)	Low-risk group (n = 1015)	$\chi^2$	P
Strongly agree	26 (18.2%)	178 (17.5%)	7.55	0.11
When I go out or contact others, I feel uneasy				
Strongly disagree	5 (3.5%)	81 (8.0%)		
Disagree	9 (6.3%)	89 (8.8%)		
Neutral	50 (35.0%)	383 (37.7%)		
Agree	55 (38.5%)	305 (30.0%)	1.11	0.90
Strongly agree	24 (16.8%)	157 (15.5%)		
I feel upset with people who have a cough				
Strongly disagree	3 (2.1%)	32 (3.2%)		
Disagree	5 (3.5%)	35 (3.4%)		
Neutral	28 (19.6%)	227 (22.4%)	34.22	<0.001
Agree	62 (42.4%)	404 (39.8%)		
Strongly agree	45 (31.5%)	317 (31.2%)		
Preventive behaviour				
I will reduce going out				
Strongly disagree	3 (2.1%)	3 (0.3%)	34.22	<0.001
Disagree	5 (3.5%)	1 (0.1%)		
Neutral	12 (8.4%)	40 (3.9%)		
Agree	35 (24.5%)	184 (18.1%)		
Strongly agree	88 (61.5%)	787 (77.5%)		

**TABLE 4** Analysis of the causes of acute stress disorder

Responses	OR (95%CI)	B	P-value
Information sources			
Unofficial media	1.00		
Community publicity	2.41 (0.21–27.65)		
Other	7.47 (1.60–34.96)		
Official media	0.79 (0.49–1.26)	−0.24	0.02
Physical contact with confirmed or suspected cases (COVID-19)			
No	1.00		
Yes	12.05 (3.42–42.44)	2.49	<0.001
I think the pandemic is far away from me			
Strongly disagree	1.00		
Disagree	1.08 (0.67–1.76)		
Neutral	1.38 (0.82–2.29)		
Strongly agree	2.54 (0.51–12.64)		
Agree	3.55 (1.60–7.87)	1.27	0.02

subsequent effects on career planning among healthcare students. The Stanford Acute Stress Reaction Questionnaire (SASRQ) was used to investigate the incidence of acute stress disorder among healthcare students during the early stages of the COVID-19 pandemic. Results showed that the ASD high-risk group accounted for 12.3% of the total subjects, and exhibited significantly higher SASRQ scores, dissociative symptoms, trauma re-experience, avoidance, and irritability scores than the low-risk group ( $P < 0.001$ ).

A cross-sectional and nation-wide survey of college students conducted in China found that the prevalence rates of probable acute stress was 34.9% (Ma *et al.* 2020), which is higher than our finding, potential explanations of the different results could be due to the differences in sampling and measures. Findings further indicated that the COVID-19 outbreak had a psychological impact on healthcare students. Therefore, it is important to attend to the psychological difficulties experienced by this population. Furthermore, ASD can be an indicator of a transient mental disorder within 1 month of the traumatic experience. Without prompt intervention, it may develop into post-traumatic stress disorder (PTSD) (Bryant 2018). The prevalence of PTSD was found to be 2.7% in a sample of home-quarantined Chinese university students (Tang *et al.* 2020). Another study found that 3 months after the SARS outbreak ended, 114 respondents (30.7%) were diagnosed with PTSD (Sun 2019). The present study further reported that having physical contact with a confirmed or suspected COVID-19 case was an independent risk factor for ASD. These results indicate that the more exposure to confirmed or suspected cases, the higher the risk of developing ASD, which is consistent with the conclusion of previous research (Zhong 2020).

**TABLE 5** Comparison of career planning between the ASD high-risk and low-risk groups

Responses	High-risk group (n = 143)	Low-risk group (n = 1015)	$\chi^2$	P-value
Your major is related to your favourite occupation			6.93	0.01
Yes	58 (40.6%)	531 (52.3%)		
No	85 (59.4%)	484 (47.7%)		
Do you know your study and work plan for the next 3–5 years?			20.36	<0.001
Unclear	74 (51.7%)	359 (35.4%)		
Never considered it	12 (8.4%)	55 (5.4%)		
Clear	41 (28.7%)	476 (46.9%)		
Perfectly clear	16 (11.2%)	125 (12.3%)		
Do you know the direction of your employment?			44.22	<0.001
Unclear	62 (43.4%)	223 (22.0%)		
Never considered it	7 (4.9%)	7 (0.7%)		
Clear	63 (44.1%)	664 (65.4%)		
Perfectly clear	11 (7.7%)	121 (11.9%)		
Career planning knowledge			16.54	<0.001
Do not know	12 (8.4%)	30 (3.0%)		
Know a little	81 (56.6%)	495 (48.8%)		
Know a lot	50 (35.0%)	490 (48.3%)		
Personal career planning			3.17	0.21
Unclear	21 (14.7%)	115 (11.3%)		
Indifferent	16 (11.2%)	83 (8.2%)		
Important	106 (74.1%)	817 (80.5%)		
After the COVID-19, I will no longer be engaged in the medical profession after graduation			59.51	<0.001
Strongly disagree	48 (33.6%)	644 (63.4%)		
Disagree	41 (28.7%)	231 (22.8%)		
Neutral	45 (31.5%)	123 (12.1%)		
Agree	6 (4.2%)	10 (1.0%)		
Strongly agree	3 (2.1%)	7 (0.7%)		
COVID-19 has no effect on my future medical profession			3.87	0.42
Strongly disagree	21 (14.7%)	155 (15.3%)		
Disagree	35 (24.5%)	213 (21.0%)		
Neutral	47 (32.9%)	291 (28.7%)		
Agree	21 (14.7%)	210 (20.7%)		
Strongly agree	19 (13.3%)	146 (14.4%)		
After COVID-19, my family will not approve of my medical career			26.51	<0.001
Strongly disagree	64 (44.8%)	653 (64.3%)		
Disagree	27 (18.9%)	171 (16.8%)		
Neutral	46 (32.2%)	156 (15.4%)		
Agree	4 (2.8%)	24 (2.4%)		
Strongly agree	2 (1.4%)	11 (1.1%)		
Have you ever attended courses and lectures in career planning education?			0.88	0.64
Never	24 (16.8%)	142 (14.0%)		
Some	103 (72.0%)	764 (75.3%)		
Many	16 (11.2%)	109 (10.7%)		

### Mental health may affect healthcare students' cognition-belief-preventive behaviours in the prevention of COVID-19

Positive coping style can reduce the occurrence of negative emotions. Previous research revealed that college students' cognitive level and behaviours towards COVID-19 affected their mental health, and cognitive

level and healthy behaviours were positively correlated (Chang 2020). In the present study, the findings showed that those who perceived that the pandemic was far away from them had a higher risk of ASD. However, another study suggested that the more college students focussed on the pandemic, the higher their risk of developing mental health problems (Zhong 2020). The inconsistent results may be related to

sample size and different evaluation tools. Previous studies have shown that clearer cognitive processes led to better preventive measures, thus improving the psychological state and leading to active coping regarding the pandemic (Sun 2019). This is consistent with the guiding role of the theoretical model of knowledge, trust, and action. Therefore, relevant government departments and universities should make use of social media software and platforms to encourage healthcare students to voluntarily engage in COVID-19-related education initiatives.

Our study also found that participants in the ASD high-risk group were more likely to acquire COVID-19-related knowledge from unofficial media sources. This is supported by previous research, which showed that mental health problems were positively associated with frequent social media exposure (Gao *et al.* 2020). Particularly, Silver and colleagues found a strong association between attack-related media exposure and acute stress symptoms (Santos 2020). In addition, we found that the high-risk group had lower awareness rates of preventive knowledge, higher incidences of symptoms among themselves and their families, went out more frequently, and paid less attention to control of the pandemic. Although regression analysis did not confirm that these are independent risk factors for ASD, findings suggest that we should nevertheless pay attention to these factors.

### **Mental health may affect the future career planning of healthcare students**

Career planning of medical students is influenced by personal factors such as interest, personality, and ability (Gong 2012). The present study found that mental health affected the future career development plans of healthcare students. Students in the ASD high-risk group were less clear about their study and work plans, their employment directions, and career development plans for the next 3–5 years. In addition, students in the ASD high-risk group reported that they were likely to leave the medical profession after graduating and believed that their families would not approve of them pursuing a medical career due to the COVID-19 pandemic. This finding is consistent with the small sample study conducted among South Korea nursing students, which revealed that almost all participants decided to leave the nursing profession due to the COVID-19 pandemic (Santos 2020). This may be related to the lack of professional identity of some healthcare

students, as well as the front-line confidence report against the pandemic.

Furthermore, results showed that among 1158 participants, 923 (79.7%) students perceived career planning as very important. However, 136 (11.7%) students were unclear about career development planning, and 166 (14.3%) students never took part in career planning courses or lectures. The results were consistent with a previous study (Cheng 2014), which revealed that medical students face a lack of career planning education. Therefore, healthcare colleges should conduct career education drives according to different characteristics of medical students at different stages to help students enhance their professional identities. Further to traditional classroom teaching, supplementary education initiatives can also be conducted, such as sharing of graduates' job-hunting experiences and participation in COVID-19 voluntary healthcare activities.

### **Limitations**

The present study has several limitations. The questionnaire was conducted online. Although it was consistent with the safety and efficiency of the survey during the COVID-19 outbreak, there was a lack of supervision over the actual responses of the research subjects. In addition, only five medical universities were investigated in our study; therefore, sample representativeness should be further improved in future research.

### **CONCLUSIONS**

There are several studies investigating the impact of COVID-19 on the mental health of college students, but few on the prevalence of acute stress disorder (ASD) during COVID-19 and its influences on career planning among healthcare students.

This study found that two factors increased the risk of acute stress disorder in the students, including 'I think the pandemic is far away from me' and 'Physical contact with confirmed or suspected cases'. Universities and relevant departments should provide more information and moral support for these students.

### **RELEVANCE FOR CLINICAL PRACTICE**

The findings presented the COVID-19 pandemic outbreak might induce acute stress disorder (ASD) among healthcare students. Identifying the risk and protective factors is important to reduce acute psychological



responses. Psychosocial support, social support, and mental health services should be provided to those students at risk. Universities and relevant departments should take measures of vocational education and attach importance to the education of emergency and epidemic prevention and life education. Without appropriate measures and interventions, healthcare students may develop more serious psychological problems, such as post-traumatic stress disorder, even affecting the employment rate of the medical industry.

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