Anxiety and depression levels of the general population during the rapid progressing stage in the coronavirus disease 2019 outbreak: a cross-sectional online investigation in China

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ABSTRACT

Objective The outbreak of COVID-19 has major impacts on the psychological health of the public. This study aimed to investigate the anxiety and depression levels of the general population during the rapid progressing stage of COVID-19 pandemic in China and to explore the associated factors.

Design and setting A cross-sectional online survey.

Participants 2651 Chinese people.

Measures The Hospital Anxiety and Depression Scale was used to measure their psychological health. A structured questionnaire collected possible associated factors, including sociodemographic characteristics, health information, contact history-related information, experience and perceptions, knowledge and education and adopted precautions. Multiple linear regression was conducted to explore the factors associated with anxiety and depression.

Results The mean score of anxiety and depression was 4.35 and 4.38, respectively. The rates of people with anxiety and depressive symptoms (with >7 score in the subscale) were 14.15% and 17.35%, respectively. Participants without political party membership, with contact history of COVID-19, were more anxious; whereas people who were younger, unsatisfied with current precautions, perceiving higher risks of infection, lower knowledge and poorer health presented higher anxiety and depression levels. Moreover, those who were females, married, lived alone and wore mask were more anxious; whereas people who were younger, experienced public health crisis, did not take precautions (regular work-rest, exercise) had higher depression level.

Conclusions During the rapid progressing stage of COVID-19 pandemic in China, one-seventh and one-sixth respondents presented anxiety and depression symptoms, respectively. The risk factors for anxiety and depression included the following: without political party membership, with contact history of COVID-19, going out or gathering, taking Chinese medicine herbs, being unsatisfied with current precautions, perceiving higher susceptibility, lower knowledge and poorer health status. Extensive information and psychological support should be provided to improve the mental health of the general population.

INTRODUCTION

In December 2019, the COVID-19 became an epidemic in China and later, a global pandemic. This is the third outbreak of human coronavirus in the past two decades after the SARS in 2003 and the Middle East respiratory syndrome (MERS) in 2015. The novel coronavirus has strong capability of human-to-human transmission, leading to the rapid global spread.1 On 31 January 2020, the number of COVID-19 cases reached 11 791 in China, and the WHO declared the COVID-19 outbreak to be a public health emergency of international concern.2 The number of cases increased rapidly since then. According to the data from the Chinese National Health Commission (NHC), the initial number of COVID-19 cases was 40 171, with 908 deaths until 9 February 2020 (before the launch of the current study).3 This figure rapidly increased to 74 576 cases with 2118 deaths after 10 days.4 The peak of this pandemic in China occurred on 12 February 2020, with 15 152 new cases and 254 deaths on that day.5 The global pandemic lasted for a year. By 8 February 2021, there were 105 805 951 confirmed cases in the world, including 2 312 278 deaths.6 In response to the original outbreak, China activated various emergency
responses, such as the lockdown of Wuhan (the epicentre in China), a nationwide quarantine policy, building specialty and Fang Cang Shelter hospitals and sending tens of thousands of healthcare professionals to support Wuhan.7

The coronavirus outbreak also had major psychosocial implications.8 The rapid evolution of the COVID-19 epidemic, personal health concerns and implementation of precautionary policies (eg, quarantine orders and travel restrictions), possibly created psychological distress, including anxiety, depression and anger. Moreover, the extensive media coverage of the outbreak may trigger or aggravate global anxiety and post-traumatic stress disorder (PTSD). The outbreak of SARS increased the prevalence of depression symptoms in Taiwan (3.7%),9 Toronto (31.2%)10 and Hong Kong (15.6%).11 The presence of PTSD was as high as 25.6%–28.9% among those who were quarantined or infected.10 11 During MERS, 7.6% of Korean public showed symptoms of anxiety, and the prevalence remained 3.0% at 4–6 months after the outbreak.12 To cope with the psychological impacts, the NHC published the Intervention Guidelines for Psychological Crisis during the COVID-19 pandemic (NHC Guideline) on 26 January 2020.13 The psychological responses of the general populations include panic, anxiety, disappointment, giving up, fear of going out, unreasonable disinfection, aggressive behaviours or over-optimism.13 People may have different psychological responses to different types of contagious diseases and at different stages of the outbreaks. However, little is known about the actual psychological responses of the general population at the rapid progressing stage of this COVID-19 pandemic.

Understanding the factors associated with the psychological responses of the general population can help identify the high-risk groups for psychological disorders and develop specific interventions. Some studies have reported various factors influencing psychological health during SARS and MERS. People who were female, younger aged, married, with higher education and living alone had higher anxiety and depression levels.10 14 15 Additionally, with contact history of the coronavirus, perceived poor health status, greater severity and susceptibility of the disease were associated with higher anxiety and depression levels.9 10 14 15 Lack of experience in contagious disease outbreaks or knowledge about the coronavirus could trigger depression symptoms,16 whereas satisfaction with preparedness of the government is associated with better psychological health.16

Various studies reported the psychological responses in different populations at different stages of this COVID-19 pandemic. A systematic review reported a 31.9% prevalence of anxiety (95% CI: 27.5 to 36.7) among general populations in the current COVID-19 pandemic, and a similar prevalence of 33.7% (95% CI: 27.5 to 30.6) for depression.17 That study also summarised the high-risk groups of people for psychological disorders. People who were female, 21–40 years old, with higher education, with chronic illness, without accurate knowledge or information about the pandemic reported higher prevalence of anxiety or depression. Another systematic review reported a 46% prevalence of anxiety symptoms (95% CI: 33.9 to 58.2) from 16 studies with 25755 participants in coronavirus epidemics, including SARS, MERS and COVID-19.18 This systematic review did not identify age or gender as significant moderators for anxiety symptoms. Thus, no consensus about the factors associated with anxiety or depression during the pandemic was achieved.

To date, most studies among Chinese were conducted either during the initial stage (end of January to 8 February 2020) or in the postpeak stage (13 February 2020 or after) of the pandemic.19–24 Before the peak in China, the prevalence of anxiety ranged from 12.2% to 28.8%, whereas the data of depression ranged from 11.0% to 26.16%.19–21 After the peak, the prevalence of anxiety and depression symptoms revealed increasing trends (20.8% to 44.2% for anxiety, 19.5% to 64.6% for depression).22–24 However, limited evidence is available regarding the anxiety and depression levels of the general population at the rapid progressing stage of COVID-19 in China, especially when the daily new cases reached the peak.

Therefore, the current study was conducted to identify the anxiety and depression levels of the general population during the rapid progressing stage in COVID-19 pandemic in China and to explore their associated factors. The study findings can help understand people’s psychological responses in the peak stage of a pandemic and provide valuable references for developing psychological interventions to high-risk groups.

METHODS
Study design and participants
To eliminate close personal contacts and mass gatherings during the COVID-19 outbreak,6 this cross-sectional study used an online survey with snowball sampling. The online survey was distributed from 10 to 19 February 2020 in China, when the number of daily cases was rapidly increasing and reached the peak. People who received the survey link could complete the survey and send the link to others. All participants were recruited online by the research team.

Study instrument
Considering its good validity, reliability and conciseness, the Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression. HADS is a 14-item four-point Likert scale with the subscales for anxiety (7-item) and depression (7-item).25 Each subscale ranges from 0 to 21 (0–3 for each item), and a higher score indicates a higher level of anxiety/depression. An overall score ≥15 indicates psychological distress. A subscale score ≤7 indicates no symptom of anxiety or depression, whereas ≥11 indicates obvious symptoms. A subscale score >7 reveals good sensitivity and specificity.
in screening anxiety/depression, which was adopted in the current study. HADS has established good psychometric properties in different Chinese populations, including students, general populations and community residents. In the current study, this instrument revealed good internal consistency with a Cronbach’s α of 0.817 for the whole scale, 0.755 for the anxiety subscale and 0.791 for the depression subscale.

A structured questionnaire was used (online supplemental file 1) to explore the possible factors related to anxiety and depression among the general population during the COVID-19 pandemic. Based on a literature review about influencing factors of anxiety or depression, the current study collected the following data: (a) sociodemographic characteristics, including age, gender, education, working status, political party membership, marital status, monthly income and living conditions; (b) perceived health status, measured by a visual analogue scale (VAS=0 indicating the poorest health and 100 indicating the best health); (c) contact history-related information, including travel history to Hubei in the past 2 weeks, close contact with any COVID-19 patient, whether received quarantine, with COVID-19 patient(s) in the family or the community and distance to the nearest COVID-19 patient and hospital (in kilometres); (d) experiences and perceptions, including previous experience in a similar public health crisis (with ‘yes’ or ‘no’ choices), perceived risk of being infected (VAS=0 indicating no risk and 100 indicating definitely being infected); (e) knowledge and education needs, including whether received education on COVID-19, self-rated level of knowledge (VAS=0 indicating no knowledge and 100 indicating full knowledge) and needs for further education and (f) adopted precautions, including the types of precautions adopted by the community, family and individuals; the frequency of going out; whether wore masks when going out; types of masks and satisfaction level to current precautions (six-point Likert choices).

To examine its readability, clarity and length, the study instrument was pretested among 20 people who were invited from a WeChat group of a community centre in Changsha, Hunan. No changes were required after the pretest. The questionnaire could be completed within 15 min.

**Patient and public involvement**

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Data collection**

The questionnaire was presented in the Wenjuanxing online investigation platform (www.wjx.cn, Ranxing Information Technology Co.). The research team widely sent the survey link to possible participants through WeChat and QQ groups, including people in our contact list, member groups of community centres, learning clubs and working groups. Following snowball sampling, people who received the survey link were encouraged to send it to others. People could click the link and launch the first page, which introduced the aims and process of the survey. At the end of the first page, the question ‘Do you agree to participate in this survey?’ was asked to acquire the consent of the participants. Only the ‘Yes’ option led to the next page for the questionnaires. The first item in the questionnaire asked about age. If the answer was under 16, the questionnaire would be led back to the study introduction and consent form page, which required the electronic signature of his/her parent or guardian. All the consent forms were available for the researchers in the online investigation system. One mobile IP could only submit the answers only once to prevent duplication. The online survey was discontinued 10 days later.

**Statistical analysis**

Data were exported from the Wenjuanxing system. SPSS V.25.0 was used for data analysis. The statistics of mean, SD, count and percentage were used to describe the variables. T-test and one-way analysis of variance were used to explore the differences in HADS among participants with various characteristics. Multiple linear regression with stepwise method was conducted to explore the factors associated with anxiety and depression. Linear correlation between the dependent variables and continuous independent variables, multicollinearity and residual analysis were carefully checked for the multiple linear regression. Beta, SE and the 95% CIs were computed. Multicollinearity was excluded by the findings that all Pearson correlation coefficients between independent variables<0.5, and all tolerance values>0.780. The Dubin-Watson values were 1.984 and 2.027 for the anxiety and depression regression model, respectively, indicating the independency of residuals. The histogram, P–P plots and scatter-plots revealed that the residuals met normal distribution and homogeneity of variance. The significance level was set as 0.05.

**RESULTS**

A total of 2711 responses were received, including 60 without consent. Finally, 2651 responses from 217 cities of 30 provinces in China were analysed. Among the participants, 23.3% reported the presence of anxiety or depression symptoms (with >7 score in either subscale of HADS), including 8.2% with both symptoms.

**Characteristics of the respondents**

Most participants were female (78.54%), with no political party membership (50.74%), with a bachelor’s degree or above (83.65%), married (72.46%), employed (83.86%), at working (55.87%), with >3000 RMB personal monthly income (78.27%), living in urban areas (84.31%) and living with their family (84.61%). The mean age of the participants was 35.91 (SD=10.65) years. The characteristics of the participants are summarised in table 1.
Regarding the contact information, most respondents reported no travel history to Hubei in the past 2 weeks (97.89%), had no close contact with COVID-19 patients (94.57%), were not quarantined (78.86%) and with no COVID-19 patient in their family members or neighbours (85.67%). In the past week, 67.22% of the respondents went out for less than seven times (including 33.61% less than once), and 38.82% had been at home for 3 days or longer. The majority of the respondents (97.06%) wore masks when outside the home, and the disposable protective masks were extensively adopted (93.10%). The adopted precautions by individuals included wearing masks (95.85%), washing hands frequently (97.40%) and not going out or gathering (91.81%). In general, 90.53% of the respondents were satisfied with current precautions.

The participants reported a mean self-perceived health score of 84.13 (SD=17.00). The self-perceived risk of being infected by COVID-19 was low, with a mean of 33.61 out of 100 (SD=28.25). More than half of the respondents experienced similar public health crisis (60.32%). Most participants had learnt COVID-19-related knowledge (95.40%), primarily from the Internet (89.25%) and television (65.48%). The mean self-rated level of knowledge was 73.33 out of 100 (SD=20.92). More than half of the respondents reported needs for further education on COVID-19 (56.17%), especially on the progress of the pandemic (46.28%), personal protective measures (45.38%), diagnostic technology and treatments (43.55%).

**Anxiety and depression levels**

The mean score of anxiety and depression was 4.35 (SD=2.97) and 4.38 (SD=3.19), respectively. Based on the results of HADS, the rate of people with anxiety and depression symptoms (scores>7) was 14.15% and 17.35%, respectively. As summarised in table 1, people with different characteristics reported different anxiety and depression levels, for example, age, gender, political party membership, education levels, working status and conditions, living conditions, contact history, quarantine, wearing masks when going out, distance to the nearest COVID-19 patient and hospital, with COVID-19 patient(s) in the family/community, adoption of personal precautions, self-rated knowledge about COVID-19, self-perceived risks of getting infected, self-perceived health condition, needs of further COVID-19-related education and satisfaction to current precautions.

**Multiple linear regression analysis of anxiety and depression**

Multiple linear regression analysis (tables 2 and 3) revealed the following common risk factors for higher anxiety and depression levels: without political party membership, with contact history of COVID-19, going out or gathering, wearing masks, taking Chinese medicine herbs, being unsatisfied with current precautions, perceiving higher risks of infection, lower levels of knowledge and poorer health status. Furthermore, those who were female, married, lived alone and wore mask were more anxious; whereas people who were younger, experienced public health crisis, did not take precautions (regular work-rest, exercise) had higher depression level. Figure 1 shows the scores of anxiety and depression among different groups of participants.

**DISCUSSION**

During the rapid progressing stage of COVID-19 pandemic in China, one-seventh people presented anxiety symptoms, whereas one-sixth reported depressive symptoms. Females, those without political party membership, with contact history of COVID-19, going out or gathering, taking Chinese medicine herbs, being unsatisfied with current precautions, perceiving higher susceptibility, lower knowledge and poorer health status, reported higher anxiety and depression levels.

The current study was a nationwide online investigation with a large sample size and using validated study instrument. The participants perceived a high level of health (84.13 out of 100) and a low level of risk for infection (35.61%), which were similar to previous findings.31 32 Consistent with other online investigations, females and younger people were more likely to respond.17–19 31 32 Although 95.40% of the respondents had learnt related knowledge about COVID-19, their self-rated knowledge level was 73.33 out of 100, indicating the need for further education on COVID-19. Consistent with previous studies during the pandemic, mass media including the Internet (89.25%) and television (65.48%) were the main resources of knowledge.33 The current findings indicated the needs and importance of equipping all levels of populations with COVID-19-related information by online or mass media delivered training/education.33–35 This study also reported a high adoption rate of precautionary measures. Although the majority of the respondents (94.57%) did not contact with suspected or diagnosed COVID-19 cases, they strictly followed the precautions recommended by the NHC, such as wearing masks, not going out or gathering, washing hands and frequent ventilation. More than half of the respondents (60.32%) had experienced SARS, which may explain their higher confidence about the effectiveness of these precautionary measures than those without such experience. Compared with other countries, China was seriously affected by SARS, and this experience may have contributed to the public’s adherence to the recommended precaution measures, such as wearing masks.36

The 14.15% and 17.35% prevalence of anxiety and depression symptoms in the current study were similar to that in a previous one conducted at the peak of the COVID-19 outbreak in China (13.5% for anxiety and 17.2% for depression).37 The rapidly increasing number of infected cases and deaths, national quarantine policy, fear of infection and uncertainty imposed psychological distress on the public.8 Another study in the initial stage of COVID-19 reported a similar prevalence of depression
| Characteristics          | Categories                  | N (%) | Anxiety |      | Depression |      |
|-------------------------|-----------------------------|-------|---------|------|------------|------|
|                         |                             |       | x±s     | T/F  | P value    | x±s  | T/F  | P value |
| All participants        |                             |       | 4.35±2.97 | (range: 0–19) | 4.38±3.18 | (range: 0–19) |
| Gender                  | Males                       | 569   | 3.92±2.90 | −3.962 | <0.001     | 3.99±3.15 | −3.319 | 0.001   |
|                         | Females                     | 2082  | 4.48±2.98 |       |            | 4.49±3.19 |       |         |
| Age                     | Mean: 35.91±10.65           |       | 3.42±2.58 | 5.055 | <0.001     | 4.22±2.99 | 5.232 | <0.001 |
|                         | 13–20                       | 144   |         |       |            |       |       |         |
|                         | 20–29                       | 639   | 4.50±3.06 | 5.453 | 0.009      | 4.75±3.15 |       |         |
|                         | 30–39                       | 892   | 4.53±2.88 |       |            | 4.44±3.22 |       |         |
|                         | 40–49                       | 683   | 4.22±3.04 |       |            | 4.19±3.14 |       |         |
|                         | 50–59                       | 242   | 4.43±2.95 |       |            | 4.17±3.29 |       |         |
|                         | ≥60                         | 51    | 3.45±2.98 |       |            | 2.76±3.04 |       |         |
| Political party          | General population          | 1345  | 4.54±3.03 | 3.849 | 0.009      | 4.49±3.26 | 3.376 | 0.018   |
| membership              | Communist Youth League      | 582   | 4.13±2.91 |       |            | 4.47±3.10 |       |         |
|                         | The Communist Party         | 662   | 4.17±2.89 |       |            | 4.16±3.12 |       |         |
|                         | Other democratic parties    | 62    | 4.29±2.86 |       |            | 3.50±2.86 |       |         |
| Education                | Middle school (≤9 years)    | 113   | 4.01±2.99 | 3.737 | 0.011      | 3.80±3.15 | 2.488 | 0.059   |
|                         | High school (10–12 years)   | 294   | 4.29±3.08 |       |            | 4.39±3.22 |       |         |
|                         | Associate or bachelor (15–18 years) | 1999 | 4.44±2.96 |       |            | 4.45±3.18 |       |         |
|                         | Master or above             | 245   | 3.83±2.83 |       |            | 4.05±3.17 |       |         |
| Employment              | Retired                     | 95    | 4.13±2.98 | 4.345 | 0.013      | 3.45±3.19 | 4.228 | 0.015   |
|                         | Unemployed                  | 333   | 3.39±2.95 |       |            | 4.38±3.18 |       |         |
|                         | Employed                    | 2223  | 4.42±2.97 |       |            | 4.42±3.18 |       |         |
| Working status           | Normal working              | 1481  | 4.59±3.01 | 7.430 | <0.001     | 4.55±3.26 | 3.600 | 0.013   |
|                         | Home-office working         | 450   | 4.01±2.85 |       |            | 4.02±2.95 |       |         |
|                         | On holiday                  | 377   | 4.03±2.88 |       |            | 4.25±3.04 |       |         |
|                         | Not working                 | 343   | 4.11±2.95 |       |            | 4.29±3.29 |       |         |
| Marital status          | Single                      | 663   | 4.12±2.92 | 3.909 | 0.020      | 4.58±3.02 | 2.117 | 0.121   |
|                         | Married                     | 1921  | 4.45±2.97 |       |            | 4.33±3.23 |       |         |
|                         | Others                      | 67    | 3.90±3.36 |       |            | 3.96±3.42 |       |         |
| Characteristics                              | Categories            | N (%)                | Anxiety | Depression |
|---------------------------------------------|-----------------------|----------------------|---------|------------|
|                                             |                       |                      | x±s     | T/F        | P value   | x±s     | T/F        | P value   |
| Monthly income (RMB)                        | <1000                 | 275 (10.37%)         | 3.75±2.77 | 5.783 | <0.001 | 4.36±3.01 | 2.243 | 0.062 |
|                                             | 1000–3000             | 301 (11.35%)         | 4.60±3.32 | 4.57±2.97 | 4.53±3.27 | 4.48±3.34 | 4.48±3.34 |
|                                             | 3000–5000             | 807 (30.44%)         | 4.39±2.96 | 3.98±2.73 | 4.39±3.16 | 3.91±3.01 |
|                                             | 5000–10000            | 946 (35.68%)         | 4.39±2.96 | 3.98±2.73 | 4.39±3.16 | 3.91±3.01 |
|                                             | >10000                | 322 (12.15%)         | 4.39±2.96 | 3.98±2.73 | 4.39±3.16 | 3.91±3.01 |
| Living areas                                | Rural                 | 416 (15.69%)         | 3.99±2.81 | −2.842 | 0.007 | 4.18±3.00 | −1.352 | 0.177 |
|                                             | Urban                 | 2235 (84.31%)        | 4.42±2.99 | 4.42±2.99 | 4.42±2.99 | 4.42±2.99 |
| Living conditions                           | Alone                 | 234 (8.83%)          | 4.68±3.21 | 4.086 | 0.007 | 4.74±3.34 | 4.449 | 0.004 |
|                                             | With roommate(s)     | 130 (4.90%)          | 4.16±2.73 | 4.16±2.73 | 4.16±2.73 | 4.16±2.73 |
|                                             | With family           | 2243 (86.61%)        | 4.30±2.94 | 4.30±2.94 | 4.30±2.94 | 4.30±2.94 |
|                                             | Others                | 44 (1.66%)           | 5.64±3.56 | 5.64±3.56 | 5.64±3.56 | 5.64±3.56 |
| Previous experience in a similar public health crisis | Yes                  | 1599 (60.32%)        | 4.38±2.98 | 0.559 | 0.576 | 4.47±3.26 | 1.711 | 0.087 |
|                                             | No                   | 1052 (39.68%)        | 4.31±2.95 | 4.31±2.95 | 4.31±2.95 | 4.31±2.95 |
| Travel history to Hubei in the past 2 weeks  | Yes                  | 56 (2.11%)           | 4.43±2.71 | 4.43±2.71 | 4.43±2.71 | 4.43±2.71 |
|                                             | No                   | 2595 (97.89%)        | 4.35±2.98 | −0.196 | 0.845 | 4.38±3.18 | −0.620 | 0.536 |
| Close contact with any COVID-19 patient      | Contact with suspected patients | 92 (3.47%) | 5.28±3.40 | 10.725 | <0.001 | 5.37±3.78 | 7.464 | <0.001 |
|                                             | Contact with diagnosed patients | 22 (0.83%) | 5.91±2.99 | 5.91±2.99 | 5.91±2.99 | 5.91±2.99 |
|                                             | Contact with diagnosed and suspected patients | 30 (1.13%) | 6.47±3.57 | 6.47±3.57 | 6.47±3.57 | 6.47±3.57 |
|                                             | No                   | 2507 (94.57%)        | 4.28±2.93 | 4.28±2.93 | 4.28±2.93 | 4.28±2.93 |
| Receiving quarantine                        | Quarantined at home   | 447 (16.86%)         | 4.38±2.92 | 4.38±2.92 | 4.38±2.92 | 4.38±2.92 |
|                                             | Quarantined in designated place | 42 (1.58%) | 5.02±3.27 | 5.02±3.27 | 5.02±3.27 | 5.02±3.27 |
|                                             | Quarantined in hospitals | 45 (1.70%) | 5.82±3.20 | 5.82±3.20 | 5.82±3.20 | 5.82±3.20 |
|                                             | No quarantine         | 2117 (78.86%)        | 4.30±2.96 | 4.30±2.96 | 4.30±2.96 | 4.30±2.96 |
| Frequency of going out in the past week      | <1                   | 891 (33.61%)         | 4.10±2.91 | 3.689 | 0.005 | 4.22±3.10 | 2.277 | 0.059 |
|                                             | 2–7                  | 891 (33.61%)         | 4.35±2.91 | 4.35±2.91 | 4.35±2.91 | 4.35±2.91 |
|                                             | 1 per day            | 427 (16.11%)         | 4.54±3.02 | 4.54±3.02 | 4.54±3.02 | 4.54±3.02 |
|                                             | 2–3 per day          | 301 (11.35%)         | 4.53±3.00 | 4.53±3.00 | 4.53±3.00 | 4.53±3.00 |
|                                             | >3 per day           | 141 (5.32%)          | 4.94±3.37 | 4.94±3.37 | 4.94±3.37 | 4.94±3.37 |

Continued
| Characteristics                                    | Categories | N (%)          | Anxiety           | Depression          |
|---------------------------------------------------|------------|----------------|-------------------|--------------------|
|                                                   |            |                | x±s               | T/F                |
| Duration of staying at home                       | ≤3 days    | 1622 (61.18%)  | 4.46±2.98         | 3.184              | 0.007              |
|                                                   | 4–7 days   | 393 (14.82%)   | 4.51±3.02         |                    |
|                                                   | 8–14 days  | 272 (10.26%)   | 3.91±3.03         |                    |
|                                                   | 15–21 days | 217 (8.19%)    | 4.21±2.62         |                    |
|                                                   | 22–28 days | 97 (3.66%)     | 3.99±3.17         |                    |
|                                                   | ≥28 days   | 50 (1.89%)     | 3.44±2.67         |                    |
| Wearing mask when going out                       | No         | 78 (2.94%)     | 5.37±3.57         |                    |
|                                                   | Yes        | 2573 (97.06%)  | 4.32±2.95         | −2.575             | 0.012              |
| Types of the mask                                 | Cotton     | 68 (2.57%)     | 4.16±3.22         | 3.740              | 0.011              |
|                                                   | Protective and disposable | 2468 (93.10%) | 4.32±2.92         |                    |
|                                                   | Unknown    | 37 (1.40%)     | 4.92±3.97         |                    |
| Distance of house to those of COVID-19 patients (km) | <1         | 676 (25.50%)   | 4.70±3.16         | 3.647              | 0.003              |
|                                                   | 1–20       | 1105 (41.68%)  | 4.17±2.80         |                    |
|                                                   | 21–40      | 143 (5.39%)    | 4.15±2.88         |                    |
|                                                   | 41–60      | 49 (1.85%)     | 3.65±2.82         |                    |
|                                                   | >60        | 126 (4.75%)    | 4.13±3.03         |                    |
|                                                   | Unknown    | 552 (20.82%)   | 4.46±3.06         |                    |
| Distance to the nearest hospital (km)             | ≤1         | 989 (37.31%)   | 4.60±3.10         | 5.964              | <0.001             |
|                                                   | 1–10       | 1461 (55.11%)  | 4.22±2.89         |                    |
|                                                   | 11–20      | 149 (5.62%)    | 4.38±2.87         |                    |
|                                                   | ≥20        | 52 (1.96%)     | 3.21±2.64         |                    |
| With any COVID-19 patient in the family or the community | No       | 2271 (85.67%)  | 4.27±2.94         | 5.768              | 0.001              |
|                                                   | With suspected patients | 69 (2.60%) | 5.58±2.92         |                    |
|                                                   | With diagnosed patients | 105 (3.96%) | 4.69±3.06         |                    |
|                                                   | Unknown    | 206 (7.77%)    | 4.67±3.16         |                    |
|                                                   | No patients | 2477 (93.44%)  | 4.30±2.96         | 5.888              | 0.003              |
| If yes, the quarantine measures for COVID-19 patients | Quarantined in hospitals | 135 (5.09%) | 5.59±3.07         |                    |
|                                                   | Quarantined at home | 39 (1.47%) | 4.88±3.01         |                    |
|                                                   | Vehicle management | 464 (17.50%) | 4.67±2.96         | 2.565              | 0.010              |
Table 1  Continued

| Characteristics                              | Categories                                           | N (%)          | Anxiety | T/F    | P value | Depression | T/F    | P value |
|----------------------------------------------|------------------------------------------------------|----------------|---------|--------|---------|------------|--------|---------|
| Community adopted precautionary measures     | No                                                   | 2187 (82.50%)  | 4.28±2.97 | 0.975  | 4.26±3.13 |
|                                              | Measuring body temperature for the residents         | 663 (25.01%)   | 4.35±2.91 | 0.032  | 4.64±3.29 |
|                                              | No                                                   | 1988 (74.99%)  | 4.35±2.99 | 0.975  | 4.30±3.15 |
|                                              | Disinfection for the public areas twice per day      | 1058 (39.91%)  | 4.54±3.04 | 2.594  | 4.60±3.31 |
|                                              | No                                                   | 1593 (60.09%)  | 4.23±2.92 | 0.010  | 4.24±3.10 |
|                                              | Measuring body temperature for property management staff | 1314 (49.57%) | 4.32±2.90 | 0.638  | 4.53±3.28 |
|                                              | No                                                   | 1337 (50.43%)  | 4.38±3.04 | 0.010  | 4.23±3.09 |
|                                              | No gathering                                          | 1373 (51.79%)  | 4.45±3.03 | 1.824  | 4.49±3.26 |
|                                              | No                                                   | 1278 (48.21%)  | 4.24±2.90 | 0.010  | 4.27±3.10 |
| Family adopted precautionary measures        | Yes                                                  | 2447 (92.30%)  | 4.32±2.93 | 1.568  | 5.65±3.61 |
|                                              | No                                                   | 204 (7.70%)    | 4.71±3.44 | 4.28±3.13 |
|                                              | Wearing mask                                          | 2307 (87.02%)  | 4.31±2.91 | 1.789  | 4.26±3.12 |

Continued
| Characteristics                                      | Categories                                      | N (%)       | Anxiety x±s T/F P value | Depression x±s T/F P value |
|------------------------------------------------------|-------------------------------------------------|-------------|-------------------------|---------------------------|
| Types of family adopted precautionary measures       | No                                              | 2134 (80.50%) | 4.30±2.95 1.953 | 4.26±3.12 3.892 |
|                                                      | Not going out                                   | 519 (19.58%)  | 4.55±3.14 1.938       | 4.99±3.44 <0.001 |
|                                                      | Not gathering                                   | 517 (19.50%)  | 4.30±2.95 0.051       | 4.26±3.12 3.967 |
|                                                      | Measuring body temperature daily               | 905 (34.14%)   | 4.51±3.06 -2.040     | 4.29±3.11 0.301 |
|                                                      | One room one person                             | 486 (18.33%)   | 4.27±2.92 -0.041     | 4.43±3.23 0.002 |
|                                                      | Separated personal items                       | 2165 (81.67%) | 4.22±3.04 1.045       | 4.40±3.16 0.002 |
|                                                      | Daily disinfection in the house                 | 2281 (86.04%) | 4.20±2.95 0.296       | 4.40±3.31 0.002 |
|                                                      | Building support groups                         | 766 (28.89%)   | 4.33±3.23 3.148      | 4.45±3.23 0.152 |
|                                                      | Protecting the high risk members                | 1885 (71.11%)  | 4.44±2.92 0.136       | 4.25±3.39 0.002 |
|                                                      | No                                              | 700 (26.41%)   | 4.36±3.12 0.054       | 4.45±3.23 0.152 |
|                                                      | No                                              | 1951 (73.59%)  | 4.33±3.00 0.054       | 4.45±3.23 0.152 |
### Table 1  Continued

| Characteristics | Categories                              | N (%)     | x±s       | T/F   | P value | x±s       | T/F   | P value |
|-----------------|-----------------------------------------|-----------|-----------|-------|---------|-----------|-------|---------|
| **Anxiety**     |                                         |           |           |       |         |           |       |         |
| Your adopted precautionary measures | Wearing mask                            | 2541 (95.85%) | 4.37±2.96 |       |         | 4.39±3.18 |       |         |
|                 | No                                       | 110 (4.15%)  | 3.83±3.15 | -1.892 | 0.059   | 4.15±3.32 | -0.764 | 0.445   |
|                 | Not going out or gathering                | 2434 (91.81%) | 4.27±2.92 |       |         | 4.30±3.11 |       |         |
|                 | No                                       | 217 (8.19%)  | 5.24±3.33 | 4.137  | <0.001  | 5.25±3.83 | 3.549  | <0.001  |
|                 | Washing hands frequently                 | 2582 (97.40%) | 4.34±2.96 |       |         | 4.34±3.14 |       |         |
|                 | No                                       | 69 (2.60%)   | 4.88±3.45 | 1.302  | 0.197   | 5.83±4.31 | 2.837  | 0.006   |
|                 | Disinfection                            | 1618 (61.03%) | 4.35±2.88 |       |         | 4.27±3.03 |       |         |
|                 | No                                       | 1033 (38.97%) | 4.36±3.10 | 0.117  | 0.907   | 4.55±3.41 | 2.178  | 0.030   |
|                 | Regular work and rest                    | 1728 (65.18%) | 4.21±2.91 |       |         | 4.10±3.07 |       |         |
|                 | No                                       | 923 (34.82%) | 4.62±3.07 | 3.418  | 0.001   | 4.91±3.33 | 6.131  | <0.001  |
|                 | Regular exercise                         | 1281 (48.32%) | 4.21±2.91 |       |         | 3.95±2.99 |       |         |
|                 | No                                       | 1370 (51.68%) | 4.48±2.94 | 2.362  | 0.018   | 4.79±3.31 | 6.849  | <0.001  |
|                 | Taking traditional Chinese herbs         | 359 (13.54%) | 4.76±3.10 |       |         | 4.64±3.28 |       |         |
|                 | No                                       | 2292 (86.46%) | 4.29±2.94 | -2.685 | 0.008   | 4.34±3.17 | -1.656 | 0.098   |
|                 | Yes                                      | 2529 (95.40%) | 4.34±2.92 | 1.009  | 0.315   | 4.36±3.16 | 1.571  | 0.119   |
| Whether received related education | No                                       | 122 (4.60%)   | 4.69±3.81 |       |         | 4.89±3.71 |       |         |
|                 | Television                              | 1736 (65.48%) | 4.37±2.92 | -0.381 | 0.703   | 4.29±3.11 | 2.110  | 0.035   |
| Source of education | No                                       | 915 (34.52%)  | 4.32±3.07 |       |         | 4.57±3.31 |       |         |
|                 | Internet                                | 2366 (89.25%) | 4.32±2.89 | 1.406  | 0.161   | 4.31±3.12 | 2.863  | 0.004   |
|                 | No                                       | 285 (10.75%)  | 4.62±3.53 |       |         | 4.95±3.63 |       |         |
|                 | The employer                            | 1499 (56.54%) | 4.52±3.00 | -3.357 | <0.001  | 4.46±3.18 | -1.399 | 0.162   |
|                 | No                                       | 1152 (43.46%) | 4.13±2.91 |       |         | 4.28±3.20 |       |         |
|                 | Family and friends                      | 808 (30.48%)  | 4.29±2.94 | 0.740  | 0.460   | 4.11±3.07 | 2.952  | 0.003   |
|                 | No                                       | 1843 (69.52%) | 4.38±2.98 |       |         | 4.50±3.23 |       |         |
|                 | Others                                   | 190 (7.17%)   | 4.35±2.84 | -0.005 | 0.996   | 4.33±3.09 | 0.249  | 0.804   |
|                 | No                                       | 2461 (92.83%) | 4.35±2.98 |       |         | 4.39±3.20 |       |         |
|                 | <20                                      | 45 (1.70%)    | 5.09±4.39 | 3.443  | 0.004   | 5.76±4.05 | 4.989  | <0.001  |
| Self-rated level of knowledge | 20–39                                    | 143 (5.39%)   | 5.04±3.22 |       |         | 4.93±3.35 |       |         |
|                 | Mean: 73.33±20.92                        | 342 (12.90%)  | 4.45±2.85 |       |         | 4.71±3.21 |       |         |
### Table 1  Continued

| Characteristics                  | Categories | N (%)     | Anxiety | T/F | P value | Depression | T/F | P value |
|----------------------------------|-----------|-----------|---------|-----|---------|------------|-----|---------|
|                                  |           | x±s       | T/F     |     |         | x±s        | T/F |         |
| Range: 0–100                     | 60–79     | 782 (29.50%) | 4.41±2.91 |     |         | 4.44±3.17 |     |         |
|                                  | 80–99     | 1030 (38.85%) | 4.26±2.93 |     |         | 4.21±3.10 |     |         |
|                                  | 100       | 309 (11.66%)  | 3.97±2.95 | 37.283 | <0.001 | 3.97±3.16 |     |         |
|                                  | 0         | 433 (16.33%)  | 3.26±2.70 |     |         | 3.27±2.60 |     | <0.001  |
| Perceived risk of being infected | 1–20      | 650 (24.52%)  | 3.77±2.76 |     |         | 4.00±3.00 |     |         |
|                                  | 21–40     | 504 (19.01%)  | 4.41±2.73 |     |         | 4.49±3.16 |     |         |
| Range: 0–100                     | 41–60     | 630 (23.76%)  | 4.80±2.85 |     |         | 4.64±3.05 |     |         |
|                                  | 61–80     | 210 (7.92%)   | 5.71±3.36 |     |         | 5.58±3.70 |     |         |
|                                  | >80       | 224 (8.45%)   | 5.49±3.36 |     |         | 5.54±3.74 |     |         |
|                                  | <20       | 25 (0.94%)    | 5.00±4.99 |     |         | 4.96±4.27 | 33.154 | <0.001  |
| Perceived health status          | 20–39     | 30 (1.13%)    | 6.37±2.99 |     |         | 6.67±3.26 |     |         |
|                                  | 40–59     | 151 (5.70%)   | 6.01±3.37 |     |         | 6.23±3.46 |     |         |
| Range: 0–100                     | 60–79     | 495 (18.67%)  | 5.17±2.89 |     |         | 5.15±3.25 |     |         |
|                                  | 80–99     | 1207 (45.53%) | 4.26±2.83 |     |         | 4.32±3.13 |     |         |
|                                  | 100       | 743 (28.03%)  | 3.52±2.76 |     |         | 3.48±2.78 |     |         |
|                                  | Not satisfied at all | 61 (2.30%) | 4.95±3.69 |     | 20.489 | 5.00±4.04 | 20.197 | <0.001  |
| Satisfaction to current precautions | Not satisfied | 118 (4.45%) | 5.84±3.37 |     |         | 5.73±3.72 |     |         |
|                                  | Neutral   | 73 (2.75%)    | 5.64±3.86 |     |         | 6.08±3.92 |     |         |
|                                  | A bit satisfied | 1541 (58.13%) | 4.51±2.81 |     |         | 4.57±3.14 |     |         |
|                                  | Quite satisfied | 547 (20.63%) | 3.93±2.91 |     |         | 3.87±2.98 |     |         |
|                                  | Very satisfied | 311 (11.73%) | 3.32±2.85 |     |         | 3.32±2.69 |     |         |
| Needs of education on COVID-19   | Yes       | 1489 (56.17%) | 4.98±3.00 | 12.741 | <0.001 | 4.71±3.25 | 6.048 | <0.001  |
|                                  | No        | 1162 (43.83%) | 3.55±2.73 |     |         | 3.96±3.06 |     |         |
| Transmission methods             | 1047 (39.49%) | 5.14±3.06 | −11.075 | <0.001 |         | 4.77±3.29 | −4.960 | <0.001  |

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(16.5%) and a higher prevalence of anxiety (28.8%), which may be associated with the uncertainty, lack of knowledge and lack of preparedness in that period. More importantly, the initial-stage study recruited more students, who were anxious about the pandemic and their academic progress. The prevalence of anxiety and depression in the public indicated the urgent needs of psychological support during an infectious disease epidemic. Online psychological support can be used, such as the Internet or digital cognitive behavioural therapy, which has the advantages of efficacy, cost-effectiveness and avoidance of personal contacts.

Factors associated with anxiety and depression levels

The multiple linear regression model identified common factors associated with the anxiety and depression levels of the public. People who were not political party members, with close contact to COVID-19 patients, not taking traditional Chinese herbs, unsatisfied with government’s preparedness, perceiving higher risks of being infected, perceiving lower level of knowledge and poorer health condition had higher anxiety and depression levels. Similar to previous findings, contact history, health status and perceived susceptibility are important predictors of psychological health. The worries about acquiring infection after close contact with COVID-19 patients induce higher anxiety and depression levels. Once the public perceive poor health and increased risks of infection, they become overwhelmed, anxious and depressed. Satisfaction with the adequacy of government’s preparedness would establish people’s confidence to overcome this pandemic and alleviate the anxiety and depression. Lack of knowledge may trigger anxiety owing to fear of the unknown. Higher levels of self-rated knowledge facilitate people to make reasonable responses. During the study period, the number of newly diagnosed COVID-19 patients reached the peak on 12 February 2020. Under such great changes in the pandemic, some people may feel fearful, hopeless or even panicky. Therefore, to reduce the anxiety and depression symptoms among the general public, the government should provide education (e.g., the transmission methods) and promptly publish accurate progress (e.g., medical supplies, case numbers). The government should also report the actual situation of patients, crossing them with the number of newly diagnosed COVID-19 patients. People who were not political party members, with close contact to COVID-19 patients, not taking traditional Chinese herbs, unsatisfied with government’s preparedness, perceiving higher risks of being infected, perceiving lower level of knowledge and poorer health condition had higher anxiety and depression levels. People who were not political party members, with close contact to COVID-19 patients, not taking traditional Chinese herbs, unsatisfied with government’s preparedness, perceiving higher risks of being infected, perceiving lower level of knowledge and poorer health condition had higher anxiety and depression levels. People who were not political party members, with close contact to COVID-19 patients, not taking traditional Chinese herbs, unsatisfied with government’s preparedness, perceiving higher risks of being infected, perceiving lower level of knowledge and poorer health condition had higher anxiety and depression levels.

Table 1 Continued

| Characteristics | Categories | N (%) | Anxiety | Depression |
|-----------------|------------|-------|---------|------------|
|                 |            |       | x±s     | T/F        | P value |
| Education content | No         | 10 (%) | 3.84±2.79 |           |         |
| Precautionary measures | No         | 1203 (45.38%) | 5.08±3.04 | −11.633 | <0.001 |
| No              | 1448 (54.62%) | 3.75±2.77 |         |          |         |
| Diagnostic technology and treatments | No         | 1154 (45.53%) | 5.00±2.99 | −10.124 | <0.001 |
| No              | 1497 (56.47%) | 3.85±2.85 |         |          |         |
| Progress of the pandemic | No         | 1227 (46.28%) | 5.03±3.01 | −11.102 | <0.001 |
| No              | 1424 (53.72%) | 3.77±2.81 |         |          |         |
| Other content   | No         | 31 (1.17%) | 5.29±3.14 | −1.771 | 0.077  |
| No              | 2620 (98.83%) | 4.34±2.97 |         |          |         |

Table 1: Continued

Characteristics | Categories | N (%) | Anxiety | Depression |
|-----------------|------------|-------|---------|------------|
|                 |            |       | x±s     | T/F        | P value |
| Education content | No         | 10 (%) | 3.84±2.79 |           |         |
| Precautionary measures | No         | 1203 (45.38%) | 5.08±3.04 | −11.633 | <0.001 |
| No              | 1448 (54.62%) | 3.75±2.77 |         |          |         |
| Diagnostic technology and treatments | No         | 1154 (45.53%) | 5.00±2.99 | −10.124 | <0.001 |
| No              | 1497 (56.47%) | 3.85±2.85 |         |          |         |
| Progress of the pandemic | No         | 1227 (46.28%) | 5.03±3.01 | −11.102 | <0.001 |
| No              | 1424 (53.72%) | 3.77±2.81 |         |          |         |
| Other content   | No         | 31 (1.17%) | 5.29±3.14 | −1.771 | 0.077  |
| No              | 2620 (98.83%) | 4.34±2.97 |         |          |         |
more likely to feel lonely and present anxiety symptoms, those who lived alone under the quarantine policy were level of anxiety. Consistent with previous studies, and children during the pandemic, leading to a higher ones, married people had to care about their spouse and masks could be explored in future studies. The reasons for higher levels of anxiety/depression, but cannot clarify their causal relationship between adoption of these precautions and anxiety/depression levels than Chinese. In the current study, although the t-test indicated that those who wore masks when going out reported lower anxiety and depression levels, the multiple regression analyses provided more comprehensive models with consideration of other factors, such as the perceptions of susceptibility, personal health and knowledge. Due to the limitation of the study design, the current study can reveal only the significant association between adoption of these precautions and anxiety/depression, but cannot clarify their causal relationship. The reasons for higher levels of anxiety/depression among people who took Chinese herbs or wore masks could be explored in future studies.

Besides the common factors, the present study also identified that those who were female, married and living alone had a higher level of anxiety. Previous studies also reported females were more vulnerable to stress and more likely to present anxiety symptoms during the public health crisis. Compared with the single ones, married people had to care about their spouse and children during the pandemic, leading to a higher level of anxiety. Consistent with previous studies, those who lived alone under the quarantine policy were more likely to feel lonely and present anxiety symptoms, indicating the importance of social support for psychological health.

The participants who were younger, with experience in public health crisis reported higher depression levels, whereas who took precautions in families, regularly rested and exercised had lower depression levels. This finding was consistent with a previous one that younger people may have more access to information about the pandemic, thereby inducing depression. Moreover, as the key working force in the society, younger people may be more worried about their career and economic loss caused by the pandemic, so they presented higher depression levels. As previously discussed, the adoption of precautions either by family or individuals can help to reduce the depression symptoms. Previous studies have commonly reported exercise as an effective approach to relieve depression in various populations.

Moreover, precautionary measures such as regular rest and exercise may increase the confidence of individuals about their health, thereby reducing depression. These findings indicated the importance of introducing precautions and healthy lifestyles during this pandemic.

The current study has some limitations. First, this online investigation employed snowball sampling, which may induce bias in respondents’ characteristics. For example, the proportion of males and old participants was low, similar as reported in other online investigations. Caution is needed when generalising the findings to other

| Independent variables | B   | 95% CI       | SE  | P value |
|-----------------------|-----|--------------|-----|---------|
| Constant              | 6.491 | 5.215 - 7.767 | 0.651 | <0.001† |
| Gender                | 0.273 | 0.025 - 0.522 | 0.127 | 0.031*  |
| Marital status        | 0.467 | 0.236 - 0.699 | 0.118 | <0.001† |
| Political party membership | -0.147 | -0.259 - -0.034 | 0.058 | 0.011*  |
| Living conditions     | -0.392 | -0.728 - -0.055 | 0.172 | 0.022*  |
| Contact history       | 0.765 | 0.312 - 1.217 | 0.061 | 0.001†  |
| Wearing mask when going out | 0.825 | 0.214 - 1.436 | 0.312 | 0.008†  |
| Individuals precautionary measures_wearing mask | 0.686 | 0.167 - 1.206 | 0.265 | 0.010*  |
| Individuals precautionary measures_not going out or gathering | -0.786 | -1.154 - -0.417 | 0.188 | <0.001† |
| Individuals precautionary measures_taking Chinese herbs | 0.483 | 0.190 - 0.777 | 0.150 | 0.001†  |
| Satisfaction to current precautions | -0.790 | -1.194 - -0.386 | 0.206 | <0.001† |
| Perceived risk of getting infected | 0.022 | 0.018 - 0.026 | 0.002 | <0.001† |
| Perceived health condition | -0.029 | -0.035 - -0.022 | 0.003 | <0.001† |
| Self-rated level of knowledge | -0.012 | -0.017 - -0.007 | 0.003 | <0.001† |

Adjusted $R^2=0.149$, $p<0.001$. Dependent variable: the score of anxiety subscale. Independent variables: age, gender, education, political party membership, employment status, marital status, monthly income, living areas and conditions, previous experience in public health crisis, travel history to Hubei, contact history with the patients, whether receive quarantine, frequency of going out, duration of staying at home, wearing mask when going out, whether with patient in the family or community, family and individual adopted precautions (seven variables), the needs of education, perceived health condition and risk of being infected, self-rated level of knowledge and satisfaction level to current precautions.

†P<0.01. *P<0.05.
Future study could employ a random-based sampling to recruit a more representative sample. Second, this cross-sectional study was conducted during the rapid progressing stage in this epidemic. Longitudinal studies could be conducted to explore the dynamic changes in psychological health. Qualitative studies are also recommended to explore in-depth information about people’s psychological responses and related factors. Moreover, the possible factors associated with anxiety and depression were explored based on literature review and measured by simple questions. For example, health condition and COVID-19 knowledge were measured only by single VAS items. Future studies could explore the influencing factors within the conceptual framework,

| Independent variables                                      | B    | 95% CI          | SE  | P value |
|------------------------------------------------------------|------|-----------------|-----|---------|
| Constant                                                   | 9.307| 8.132 to 10.481 | 0.599| <0.001† |
| Age                                                       | −0.023| −0.034 to −0.013 | 0.005| <0.001† |
| Gender                                                    | 0.273| 0.001 to 0.546  | 0.139| 0.050   |
| Political membership                                       | −0.138| −0.261 to −0.015 | 0.063| 0.028*  |
| Contact history                                            | 0.581| 0.086 to 1.076   | 0.252| 0.021*  |
| Previous experience in public health crisis               | 0.412| 0.182 to 0.642   | 0.117| <0.001† |
| Whether family adopted precautionary measures              | −1.138| −1.557 to −0.719 | 0.214| <0.001† |
| Individuals precautionary measures_not going out or gathering | −0.533| −0.940 to −0.126 | 0.208| 0.010*  |
| Individuals precautionary measures_wearing mask            | 0.591| 0.035 to 1.147   | 0.283| 0.037*  |
| Individuals precautionary measures_regular work and rest   | −0.326| −0.585 to −0.068 | 0.132| 0.013*  |
| Individuals precautionary measures_regular exercise        | −0.307| −0.551 to −0.063 | 0.124| 0.014*  |
| Individuals precautionary measures_taking Chinese herbs    | 0.428| 0.107 to 0.749   | 0.164| 0.009†  |
| Satisfaction to current precautions                        | −0.720| −1.161 to −0.279 | 0.225| 0.001†  |
| Perceived risk of getting infected                         | 0.018| 0.014 to 0.022   | 0.002| <0.001† |
| Perceived health condition                                 | −0.031| −0.038 to −0.024 | 0.003| <0.001† |
| Self-rated level of knowledge                               | −0.010| −0.015 to −0.004 | 0.003| 0.001†  |

**Adjusted R²=0.134 , p<0.001.**
Dependent variable: the score of depression subscale. Independent variables: age, gender, education, political party membership, employment status, marital status, monthly income, living areas and conditions, previous experience in public health crisis, travel history to Hubei, contact history with the patients, whether receive quarantine, frequency of going out, duration of staying at home, wearing mask when going out, whether with patient in the family or community, family and individual adopted precautions (seven variables), the needs of education, perceived health condition and risk of being infected, self-rated level of knowledge and satisfaction level to current precautions.
*P<0.05.
†P<0.01.

Figure 1 Comparison of anxiety and depression scores between different groups of participants.
such as the Theory of Stress. Specific study instruments, such as a COVID-19 knowledge scale, should be employed to provide more detailed information. Qualitative studies could be designed to explore the reasons of higher levels of anxiety/depression among people who took Chinese herbs and wore masks.

The prevalence of anxiety (one-seventh) and depression (one-sixth) in the public indicated the importance and need of psychological support during a public health crisis. Individuals should follow the NHC guidelines on precautions and healthy advice to reduce the possibility of infection and improve psychological health. The government should provide extensive information on coronavirus-related knowledge, transmission methods, precautionary measures and progress of the pandemic through mass media. Online psychological support could be provided for the high risk group of people to combat the adverse psychological impacts of COVID-19.

CONCLUSION

During the rapid progressing stage of the COVID-19 pandemic in China, one-seventh and one-sixth respondents presented anxiety and depression symptoms, respectively. The risk factors for anxiety and depression included the following: without political party membership, with contact history of COVID-19, going out or gathering, wearing masks, taking Chinese medicine herbs, being unsatisfied with current precautions, perceiving higher susceptibility, lower knowledge and poorer health status. Extensive information and online psychological support should be provided to the general population, especially the high-risk groups for psychological disorders during a public health crisis.

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