

Mental health among COVID-19 survivors and healthcare workers exposed to COVID-19 in Wuhan, China: a cross-sectional study

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Abstract

The novel coronavirus disease (COVID-19) epidemic was considered to be the worst and complex virus outbreak, which caused 56,985 deaths as of April 22, 2020 already. The epidemic infectious may cause mental health crisis. Meanwhile, little is known about the specific psychological status of the COVID-19 survivors and healthcare workers. This cross-sectional study surveyed the mental health among 20 COVID-19 survivors, 54 nurses, and 24 hygienists in Wuhan, China and analyze the possible impact factors using the Symptom Check List 90 - Revised (SCL90-R) questionnaire. 3 indices and 9 dimensions were compared among job, education level, gender, age, marriage classification. This study found that mental distress among participants was not very serious in general. The survivors presented a highest score, then the hygienists, and the lowest in nurses. Low-educated and women showed significant increase. No significant difference was noted in age and marriage classification. Our study indicated that the survivors need psychological support immediately. Meanwhile, healthcare workers warrant more attention, especially low-educated and women. Comprehensive emergency response plan was warranted.

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Prevalence of psychological symptoms

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Summary

Then novel coronavirus disease (COVID-19) epidemic was considered to be the worst and complex virus outbreak, which caused 56,985 deaths as of April 22, 2020 already. The epidemic infectious may cause mental health crisis. Meanwhile, little is known about the specific psychological status of the COVID-19 survivors and healthcare workers. This cross-sectional study surveyed the mental health among 20 COVID-19 survivors, 54 nurses, and 24 hygienists in Wuhan, China and analyze the possible impact factors using the Symptom Check List 90 - Revised (SCL90-R) questionnaire. 3 indices and 9 dimensions were compared among job, education level, gender, age, marriage classification. This study found that mental distress among participants was not very serious in general. The survivors presented a highest score, then the hygienists, and the lowest in nurses. Low-educated and women showed significant increase. No significant difference was noted in age and marriage classification. Our study indicated that the survivors need psychological support immediately. Meanwhile, healthcare workers warrant more attention, especially low-educated and women. Comprehensive emergency response plan was warranted.

Keywords:

Mental health; COVID-19; SCL90-R; Survivors; Healthcare workers

Introduction

The novel coronavirus disease (COVID-19) was first reported in Wuhan, China in December, 2019(Li et al., 2020). After a latent period of 1-14 days (mostly 3-7 days), most patients infected with COVID-19 had clinical manifestations of fever, dry cough, and fatigue (Lu et al., 2020). Due to the person-to-person transmission via respiratory droplets when patients coughed or sneezed and close contact (Khan et al., 2020), the COVID-19 outbreak rapidly across China (Lijun et al., 2020). As to April 4, 2020, source told by the National Health Commission of China, the cumulative number of confirmed patients was up to 82,798 (50,333

in Wuhan), including 4,632 deaths (3,869 in Wuhan) (National Health Commission of the People's Republic of China, 2020). Meanwhile, the virus erupted in other countries which causing outbreak globally. The World Health Organization released the latest situation report 1,051,635 confirmed cases and 56,985 deaths on April 22, 2020 (World Health Organization, 2020).

Sustained growth of infections and death caused social fear and panic (Bao et al., 2020). During the treatment, isolation made patients gradually alienate to each other. On the other hand, uncertainty of disease prognosis and the threat of death, psychological health problems like depression or anxiety were more likely to occur and worsen (Xiao, 2020). A study found that COVID-19 confirmed patients suffered severe mental distress even after rehabilitation and discharge (Bo et al., 2020). These mental health problems may lead to some bad results, such as reducing the quality of life and affecting work performance (Liu et al., 2020). Previous studies showed that during the period of Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, proportion of SARS survivors in mental distress status was 9.8% in the beginning, what was worse, it has increased to 25.6% after 30 months (Mak et al., 2009). This reminded us paying attention to mental health of COVID-19 survivors, yet, recent studies mainly focused on medical treatment and virus prevention.

Furthermore, healthcare workers rushing to rescue Wuhan also faced great pressure, including high risk of infection, inadequate of personal protection equipment, no specific medication, heavy workload, isolation, negative emotions of patients, lack of contact with family members, and fatigue (Chen et al., 2020). These acute conditions may lead to severe psychological health status such as stress, anxiety, depression, insomnia, and fear. These mental health problems will not only affect the attention, understanding and decision-making ability of healthcare workers, may hamper them from fighting against COVID-19, but also have a lasting influence on their overall health (Greenberg et al., 2020). Therefore, protecting the mental health of frontline healthcare workers was of great significance to control the epidemic situation and their own long-term health.

In view of the severe mental health problems, the National Health Commission of China published guidelines for emergency psychological intervention for COVID-19 survivors and healthcare workers (National Health Commission of the People's Republic of China, 2020). Specific methods included establishment of psychological intervention working groups, psychological assistance hotlines, online mental health services, and so on (Chen et al., 2020; Lijun et al., 2020; Liu et al., 2020). However, due to the unsatisfactory overall planning, lack of communications among medical services and mental health institutions, shortage of professional and experienced psychologists and psychiatrists (Duan & Zhu, 2020), survivors and healthcare workers didn't acquire enough psychological support.

To solve the psychological health problems, we need to make clear of the mental health status of COVID-19 survivors and healthcare workers, and the impacting factors. The Symptom Check List 90 - Revised (SCL90-R) questionnaire was a multidimensional self-reported symptom scale which was used to estimate participants' psychological status (Dudley et al., 2020). Indeed, it was widely used in clinical research of medicine since its naissance (Citkowska-Kisieleska et al., 2020). Therefore, we quoted SCL90-R questionnaire to measure mental health status of survivors and healthcare workers, which could provide valuable evidence for psychological intervention among COVID-19 survivors and healthcare workers.

Materials and Methods

Study design and participants

This study is a cross-sectional, survey-based study which collected demographic information and mental health data via SCL90-R questionnaire from March 15 to 25, 2020 in Wuhan, China. A total of 20 COVID-19 survivors and 78 healthcare workers were enrolled in the study. All participants were willing to complete the questionnaire, without mental disorders, 18 years of age or older, and other inclusion criteria were able to understand, speak, and write Chinese in order to finish the SCL90-R questionnaire smoothly. The study was approved by the Medical Ethics Committee of Affiliated Hospital of Nanjing University of Chinese Medicine. Written informed consent was provided by all enrolled participants before the initial of study, and all subjects were informed that this study was anonymous, all information was confidential, and participants had the

right to end the questionnaire anytime without responsibility.

We investigated 78 healthcare workers from Wuhan No.1 Hospital, the Central Hospital of Wuhan, Wuhan Jiangxia District Hospital of Traditional Chinese Medicine, Cabin Hospital of Jiangxia District which was transformed from a gymnasium, Tongji Hospital, and Wuhan Jinyintan Hospital respectively. All of them were rushed to the rescue of Wuhan responding to the call of the Chinese government from multiple hospitals of Jiangsu Province, China from February to March 2020, consisting of 54 nurses and 24 hygienists.

20 patients with conforming COVID-19 were also surveyed in our study, who were admitted and treated in Cabin Hospital of Jiangxia District in March 2020. The included patients were diagnosed as COVID-19 and were discharged from the Cabin Hospital after recovery. Patients combined other diseases such as enteritis, or pulmonary occupying lesions were ruled out. The diagnostic criteria of COVID-19 were suspected case also has one of the following etiological or serological evidence: 1. The COVID-19 nucleic acid was identified positively by real-time fluorescence RT-PCR; 2. The virus is very homologous to COVID-19 via virus gene sequencing; 3. Serum COVID-19 specific IgM antibody and IgG antibody were positive; serum COVID-19 specific IgG antibody changed from negative to positive or rising speed in the recovery period was 4 times or more than the acute period. The discharge standard was met the following 4 requirements at the same time: 1. The body temperature returned to normal for more than 3 days; 2. Symptoms of respiratory tract greatly improved; 3. Pulmonary imaging showed that the acute exudation lesions were significantly improved; 4. The nucleic acid test of respiratory tract samples such as sputum and nasopharyngeal swab was negative for two consecutive time, sampling time shall be at least 24 hours apart. The above 2 criteria referenced “COVID-19 Diagnosis and Treatment Plan (Trial Version 7)” printed and distributed by the National Health Commission of the People’s Republic of China on March 4, 2020(China, 2020c) (National Health Commission of the People’s Republic of China, 2020).

Participants evaluation

Demographic characteristics and psychological health status data were gathered. All participants and researchers were Chinese. Therefore, Chinese language was chosen during the whole research process. Demographic data were self-reported by the interviewees, including gender (male or female), age (<32 or [?]32), classification (COVID-19 survivor, nurse, or hygienist), marriage status (married, or unmarried), and education level (high school and below, college, or bachelor and above).

The SCL90-R questionnaires was composed of 90 items, which were now classified to 9 psychological dimensions listed as: 1. Somatization (SOM); 2. Obsessive-compulsive (O-C); 3. Interpersonal sensitivity (I-S); 4. Depression (DEP); 5. Anxiety (ANX); 6. Anger-hostility (HOS); 7. Phobic anxiety (PHOB); 8. Paranoid ideation (PAR); 9. Psychoticism (PSY). All items were single choice questions, and answers to each entry were rated on a five-point scale from 1 to 5. Mental health status results corresponding to each score were “none”, “mild”, “moderate”, “relatively serious”, and “serious”, respectively. The survey was conducted in private environment spending about 25-30 minutes for each interviewee.

Definitions and scores

Previous studies have demonstrated that the SCL-90-R tests have good internal consistency, reliability, and validity (Li et al., 2015). Overall mental health status was evaluated via 3 global scales: 1. The Global Severity Index (GSI), indicating a global scale; 2. Positive Symptom Total (PST), expressing all items more than 1 point to display number of items did the subjects presenting symptoms; and 3. Positive Symptom Distress Index (PSDI), meaning the sum of values of none-zero items by PST, reflecting the extent of severity of items that subjects feel bad about themselves. Higher score indicated more seriously mental health status.

Statistical analysis

Analysis of all data was performed using the SPSS 25.0 for windows (SPSS Inc., IL, USA). Descriptive analysis was conducted to express the data; continuous variables were expressed as mean \pm standard deviation, while categorical variables were shown as percentages. A chi-squared test was used for statistical analysis and Fisher’s exact test when appropriate. P [?]0.05 was considered significant.

Results

Demographic characteristics

Demographic items in this study included gender, age, occupation classification, marriage status, educational level. A total of 98 participants were included in the research, who were separated into 3 categories according to occupational classification. Among them, 20 were COVID-19 survivors (20.41%), 54 nurses (55.10%), and 24 hygienists (24.49%) separately. Mean age was 32.1 ± 7.3 (range, 23-68), and 68 were female (69.74%). Of the marriage status, 24 (24.49%) got married and 74 (75.51%) were unmarried. 66.32% ($n=65$) had higher education of the bachelor and above while 20.41% ($n=20$) had college education, and the remained 13.27% ($n=13$) had a high school education and below (Table 1).

Psychological dimensions

The overall mean GSI, PST, and PSDI of all subjects was 1.393 ± 0.391 , 24.934 ± 21.463 , 2.296 ± 0.620 respectively. Scores of 9 dimensions were: SOM, 1.366 ± 0.415 ; O-C, 1.618 ± 0.531 ; I-S, 1.420 ± 0.528 ; DEP, 1.392 ± 0.467 ; ANX, 1.401 ± 0.432 ; HOS, 1.336 ± 0.460 ; PHOB, 1.233 ± 0.333 ; PAR, 1.268 ± 0.385 ; PSY, 1.303 ± 0.430 , separately. Among the score, PSDI, ANX, and PSY showed a rising trend (Table 2).

The mean raw score of GSI in COVID-19 survivors, nurses, and hygienists were 1.56 ± 0.35 , 1.35 ± 0.38 , and 1.40 ± 0.47 . PST were 36.25 ± 20.25 , 22.17 ± 20.93 , and 26.30 ± 23.24 . PSDI were 2.34 ± 0.34 , 2.34 ± 0.62 , and 1.99 ± 0.84 . SOM were 1.65 ± 0.53 , 1.33 ± 0.38 , and 1.25 ± 0.34 . O-C were 1.80 ± 0.47 , 1.58 ± 0.53 , and 1.61 ± 0.59 . I-S were 1.53 ± 0.49 , 1.40 ± 0.54 , and 1.42 ± 0.55 . DEP were 1.56 ± 0.38 , 1.34 ± 0.42 , and 1.47 ± 0.75 . ANX were 1.67 ± 0.45 , 1.34 ± 0.41 , and 1.39 ± 0.43 . HOS were 1.47 ± 0.41 , 1.31 ± 0.47 , and 1.30 ± 0.47 . PHOB were 1.43 ± 0.48 , 1.18 ± 0.28 , and 1.30 ± 0.34 . PAR were 1.39 ± 0.44 , 1.24 ± 0.37 , and 1.28 ± 0.41 . PSY were 1.38 ± 0.40 , 1.27 ± 0.41 , and 1.41 ± 0.57 , respectively (Table 3). In general, the mean raw score of 3 indices and 9 dimensions showed highest in COVID-19 survivors, then the hygienists, and the lowest in nurses. The COVID-19 survivors showed significantly higher scores of PST (36.25 ± 20.25 versus 22.17 ± 20.93 , $P < 0.05$), SOM (1.65 ± 0.53 versus 1.33 ± 0.38 , $P < 0.05$), O-C (1.80 ± 0.47 versus 1.58 ± 0.53 , $P < 0.05$), ANX (1.67 ± 0.45 versus 1.34 ± 0.41 , $P < 0.05$), and PHOB (1.43 ± 0.48 versus 1.18 ± 0.28 , $P < 0.05$) when compared with nurses. Meanwhile, nurses represented significantly higher in the SOM (1.33 ± 0.38 versus 1.25 ± 0.34 , $P < 0.05$), and significantly lower in the PHOB (1.18 ± 0.28 versus 1.30 ± 0.34 , $P < 0.05$) dimensions when compared with hygienists (Figure 1a, b).

There were 7 dimensions (SOM, O-C, I-S, ANX, HOS, PAR, and PSY) showing extremely high (mean raw score[?]) in COVID-19 survivors with proportions more than 15%. Moreover, there were two dimensions (O-C and ANX) in hygienists and 1 dimension (O-C) exceedingly high (mean raw score[?]) respectively (Figure 2).

Risk factors of psychological dimensions

Within the distinction of education level, participants with education of bachelor and above showed significantly lower level of GSI (1.24 ± 0.32 versus 1.37 ± 0.37 , $P < 0.05$), PST (19.00 ± 25.46 versus 24.06 ± 21.19 , $P < 0.05$), SOM (1.38 ± 0.53 versus 1.34 ± 0.40 , $P < 0.05$), O-C (1.35 ± 0.49 versus 1.59 ± 0.49 , $P < 0.05$), I-S (1.11 ± 0.16 versus 1.38 ± 0.48 , $P < 0.05$), HOS (1.17 ± 0.00 versus 1.30 ± 0.42 , $P < 0.05$), PAR (1.08 ± 0.12 versus 1.23 ± 0.32 , $P < 0.05$), and PSY (1.10 ± 0.14 versus 1.28 ± 0.39 , $P < 0.05$) compared with college educational level. Meanwhile, participants with college educational level showed significantly lower level of PST (19.00 ± 25.46 versus 49.67 ± 16.17 , $P < 0.05$), O-C (1.35 ± 0.49 versus 2.57 ± 0.85 , $P < 0.05$), I-S (1.11 ± 0.16 versus 2.48 ± 0.76 , $P < 0.05$), HOS (1.17 ± 0.00 versus 2.28 ± 0.67 , $P < 0.05$), PAR (1.08 ± 0.12 versus 2.28 ± 0.51 , $P < 0.05$), PSY (1.10 ± 0.14 versus 1.93 ± 0.95 , $P < 0.05$) than participants with high school and below education level (Figure 3a, b).

In gender aspects, female subjects expressed significantly higher scores in PSDI (2.43 ± 0.56 versus 2.00 ± 0.67 , $P < 0.05$), SOM (1.42 ± 0.43 versus 1.24 ± 0.35), O-C (1.67 ± 0.58 versus 1.50 ± 0.39), DEP (1.43 ± 0.53 versus 1.31 ± 0.29), and HOS (1.37 ± 0.49 versus 1.26 ± 0.39) compared with male participants (Figure 4a, b).

No statistical significance was discovered among participants within different age (Figure 5a, b) or marriage status (Figure 6a, b) for each aspect and dimension of the measurements.

Discussion

The COVID-19 outbreak was thought to be the most prevalent and serious epidemic since the end of December of 2019. Over 200 countries, areas or territories were suffering from the virus and more than 2 million persons infected by the acute infectious disease with over 130 thousand confirmed death globally⁶ (World Health Organization, 2020). Owing to the significant morbidity and mortality, the COVID-19 caused large scale public panic and serious psychological health stress (Kavoor, 2020). The WHO had emphasized the importance of psychological support and released some advice to survivors and health care workers (Bansal et al., 2020; Cu et al., 2020; Mo et al., 2020). However, to our knowledge, there is only a few researches focusing on mental health of COVID-19 survivors and frontline healthcare workers. Thus it is necessary to conduct scientific research to evaluate the mental health status of the COVID-19 outbreak. This study was to assess psychological health status of COVID-19 survivors, nurses, and hygienists in Wuhan, China, analyze the risk factors to influence the outcome, and provide help for mental health assistance for survivors and healthcare workers.

Results of the present research indicated that psychological health status among all participants in Wuhan, China was not very serious, and the main problems were anxiety and psychoticism. Possible reasons may be as follows: 1. Our assessment time was set on over 2 months after the outbreak when the worst situation has passed and under controlled effectively in Wuhan, China. The COVID-19 has been intensively studied through advanced medical scientific techniques and released to the public in time, making participants very familiar with the new virus and reducing their fear of the new virus; 2. The Chinese government and some medical organizations have taken a serious of measures for psychological support to the confirmed patients and healthcare professionals (National Health Commission of the People's Republic of China, 2020; Kang et al., 2020); 3. Latest daily report was released by authorities, thus the public could receive the specific trends of the epidemic situation. In addition, energy propaganda was carried out by the mainstream media to fight the virus epidemic, encouraging everyone to face it positively; 4. The epidemic crisis was under control in China, and there was still newly increased confirmed death cases. What's more, the epidemic was further expanded in other countries National Health Commission of the People's Republic of China, 2020). Under the background of globalization, and a community of sharing future for mankind, participants still felt anxiety to the COVID-19 and showed poor mental status.

Our studies showed that COVID-19 survivors suffered severe somatization, obsession-compulsion, interpersonal sensitivity, anxiety, anger-hostility, paranoid ideation, psychoticism, and highest PST score which meant they had worse psychological status compared with healthcare workers. This was consistent with a previous study about comparison of psychological symptoms between Ebola survivors and healthcare workers (Ji et al., 2017). Possible reasons were maybe the novel virus was characterized by a high possibility of being infected, and high mortality which was a life threatening event (Webster, 2020). Patients were forced isolation in specific hospitals, which divided them from work, family, and conventional daily life, so that to plumb the depths of loneliness, humiliation, and even despair (Yao et al., 2020). Besides, some bad media reported false news to mislead public which aggravated patients' panic and anxiety (Chen et al., 2020). Results analysis showed that it was important to construct an appropriate emergency response mechanism of serious infectious disease and recovery system of post-traumatic stress. Specific methods included establishing professional psychological intervention team which consisted of all mental health professionals, conducting online psychological counselling services (eg, on WeChat), and so on (Bao et al., 2020; Liu et al., 2020; Xiao, 2020). Under the guidance of government (National Health Commission of the People's Republic of China, 2020), we were required to pay attention to patients' mental health and psychological response. Psychological evaluation, counseling, and supporting should be provided to recovered patients.

This study showed that psychological status of healthcare workers including nurses and hygienists was not very serious generally, and nurses presented higher score in somatization than hygienists. It was comparable to the previous study about comparison of hygienists and nurses during the COVID-19 crisis (Lai et al., 2020).

Possible reasons probably were nurses contacted with patients directly and frequently with wearing sealed personal protective equipment which made them sultry, dyspnea, facial skin indentation or even damaged (Gheisari et al., 2020). What was worse, they need to work longer hours than usual without break or going to the toilet, causing high risk of infection. Physical fatigue made a damage to the body and performed severe physical symptoms (Li et al., 2003). However, nurses presented lower score in phobic anxiety than hygienists which was contrary to previous study (Lai et al., 2020). To our consideration, reason for this result may be the hygienists were responsible for making treating plan for patients, and they need to be very careful in each step because of the high mortality. Facing too many death and feeling powerless may lead to phobic anxiety. Though healthcare workers' mental health was not serious, attention should be paid to increasing levels of somatization, obsession-compulsion, anxiety, and phobic anxiety. Psychological counselling, disaster rescue knowledge training and simulation exercise, formulation of relevant processes and emergency plans should be implemented (Greenberg et al., 2020).

In this study, there was a negative correlation between the severity of mental state and education level, which is consistent with a previous study (Ji et al., 2017). These findings indicated education was an import and effective aspect leading people to know virus correctly and confront it positively. People with higher education level might think more about the accepted news and information, instead of believing every information they received, even rumors and false beliefs. More proper education of the novel virus applied, less mental problems they would have. Thus, we need to construct proper educational channels of major infectious disease to the public.

Of note, female participants showed worse PSDI, somatization, obsessive-compulsive, depression, and anger-hostility. It was consisted with a previous study that women had more mental problems in the COVID-19 outbreak (Lai et al., 2020). Reasons may be in face of sudden change, women can't be as calm as men. Women usually had rich inner activities as facing such an emergency crisis, and they worried about their family members or daily social interaction. This indicated us to take particular attention to female survivors and healthcare workers, more family and social support, and psychological intervention was warranted.

We also interested in whether there was divergence in different ages and marriage status. The results indicated no significant difference possibly because: Within this sudden highly infectious virus, everybody had the possibility of infection and death. The junior or senior, married or unmarried, were similar in the face of the COVID-19.

Conclusions

In this survey study of COVID-19 survivors and healthcare workers in Wuhan, China, mental distress is not very serious in general. Yet, specific methods have to be implemented to promote survivors' mental well-being immediately. Meanwhile, healthcare workers warrant more attention and intervention particularly. Furthermore, low-educated, and women require meticulous attention. To solve these problems, we call for a comprehensive emergency response plan and to be developed involving not only medical facilities but also adequate psychological support.

Limitations

This study presents several limitations. Firstly, the sample size is small. Because the crisis outbreak was still ongoing during the research period, we should allow medical staff to spend more time on patients or rest. In addition, the study was carried out during 10 days in the late stage of fighting epidemic in Wuhan, China, while the early, middle stage and longitudinal follow-up were not considered. Thus we couldn't investigate the dynamic psychological change. Further studies with larger sample size and observation of multiple time point are warranted.

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Conflict of interest statement

The authors declare that there is no conflict of interests.

Data availability statement

The data used to support the findings of this study are included within the article.

Ethical Statement

Ethical Statement is not applicable for questionnaires from human has been gathered.

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Tables

Table 1. Demographic characteristics of the participants (n=98)

Demographic items

Gender

Age

Classification

Marriage Status

Education Level

Table 1. Demographic characteristics of t

Status

Male

Female

<32

[?]³²

COVID-19 Survivor

Nurse

Hygienist

Married

Unmarried

High school and below

College

University and above

Table 2. Psychological dimensions of SCL-90-R among the participants (n=98)

Clinical Diagnosis

GSI

PST

PSDI

SOM

O-C

I-S

DEP

ANX

HOS

PHOB

PAR

Table 2. Psychological dim

Mean Score

1.393

24.934

2.296

1.366

1.618

1.420

1.392

1.401

1.336

1.233

1.268

Abbreviations: CI, Confidence interval; GSI, Global Severity Index; PST, Positive Symptom Total; PSDI, Positive Symptom Distress Index; SOM, somatization; O-C, obsessive-compulsive; I-S, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, anger-hostility; PHOB, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism.

Table 3. Mean raw score on dimensions among the participants (n=98)

GSI
PST
PSDI
SOM
O-C
I-S
DEP
ANX
HOS
PHOB
PAR
PSY

Table 3. Mean raw score on dimensions among the participants (n=98)

COVID-19 Survivors(n=20)
1.56±0.35
36.25±20.25
2.34±0.34
1.65±0.53
1.80±0.47
1.53±0.49
1.56±0.38
1.67±0.45
1.47±0.41
1.43±0.48
1.39±0.44
1.38±0.40

Note: * $p < 0.05$.

Abbreviations: CI, Confidence interval; GSI, Global Severity Index; PST, Positive Symptom Total; PSDI, Positive Symptom Distress Index; SOM, somatization; O-C, obsessive-compulsive; I-S, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, anger-hostility; PHOB, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism.

Figures legends

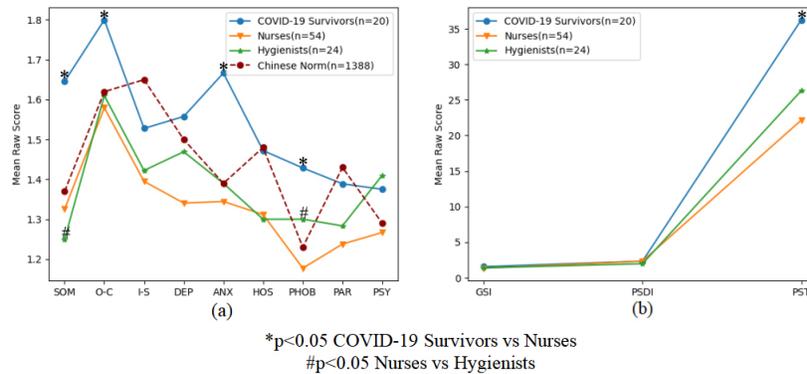


Figure 1. Scores of distributions on dimensions of participants

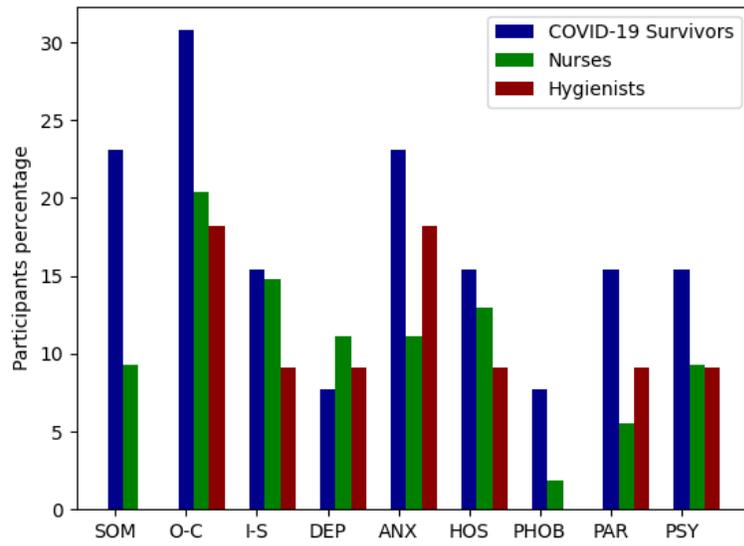


Figure 2. Percentages of participants scoring [?]2

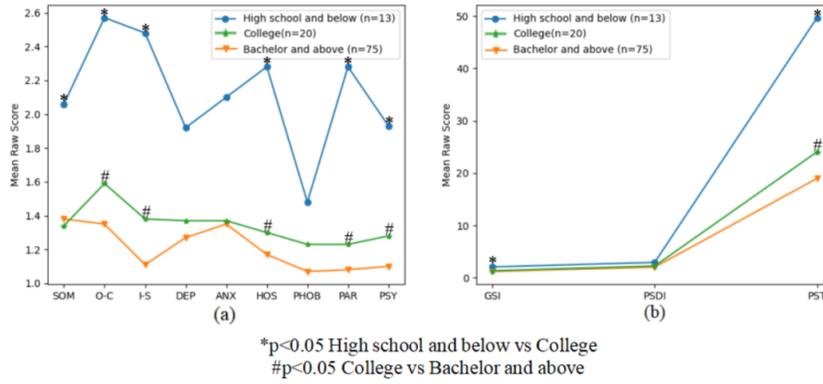


Figure 3. Scores of education difference

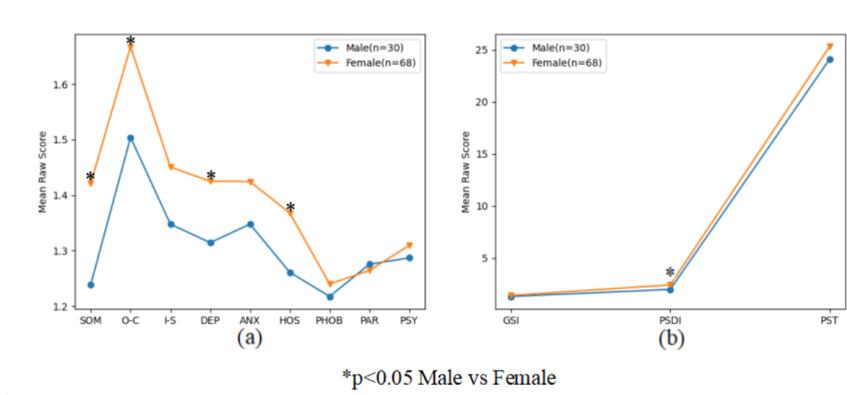


Figure 4. Scores of gender difference

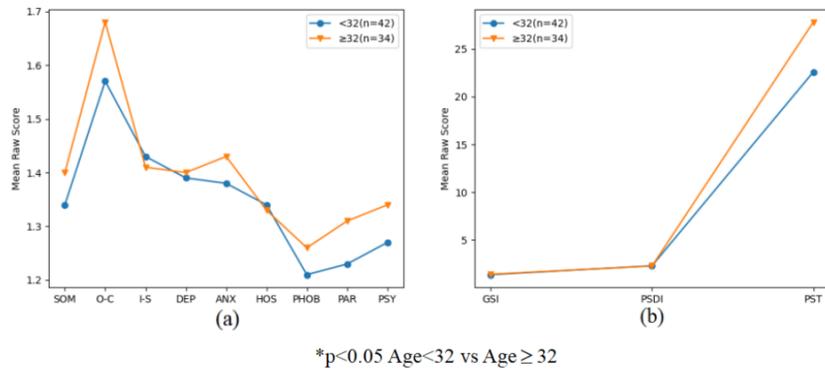


Figure 5. Scores of age difference

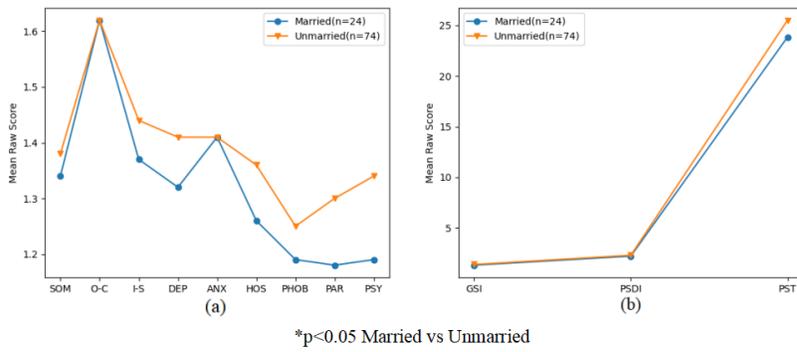
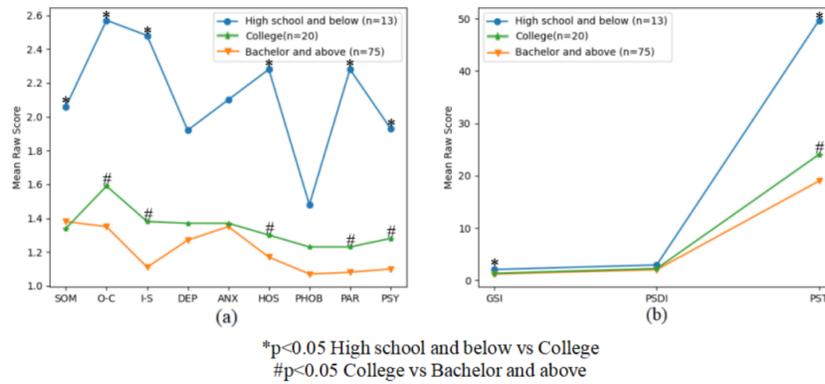
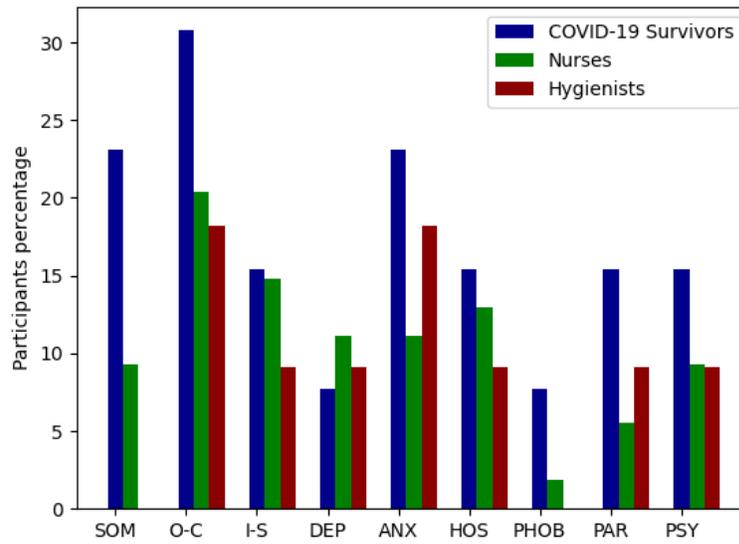
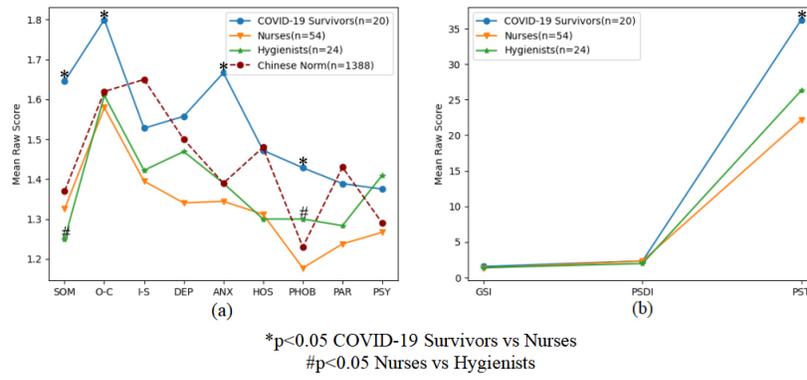
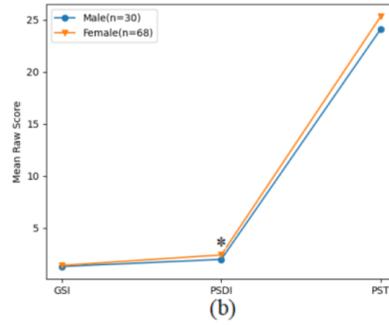
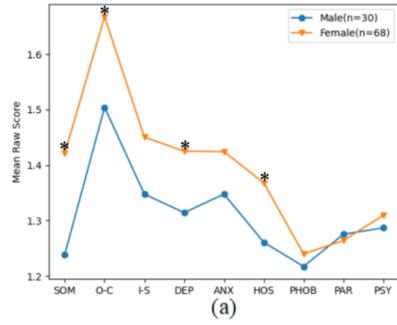
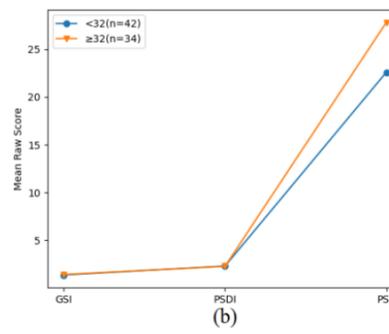
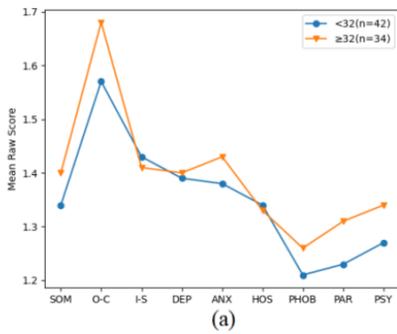


Figure 6. Scores of marriage difference

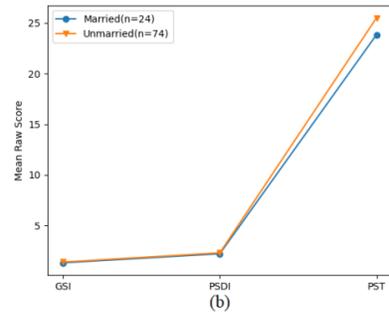
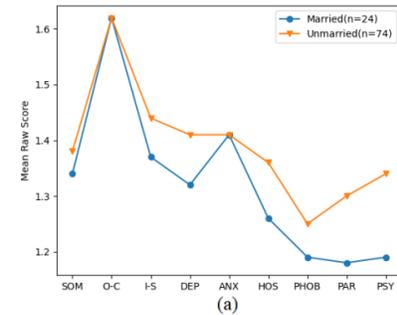




* $p < 0.05$ Male vs Female



* $p < 0.05$ Age < 32 vs Age ≥ 32



* $p < 0.05$ Married vs Unmarried