Compare the severity of psychological distress among four groups of Iranian society in COVID-19 pandemic

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Abstract

Background: Coronavirus Disease 2019 (COVID-19) pandemic has caused serious psychological problems, such as panic attack, anxiety, stress and depression. The main objective of this study was to measure the prevalence and compare the severity of this psychological distress among four groups of Iranian population.

Method: In cross-sectional survey, the mental health status of four groups of Iranian society such as community population, patients with COVID-19, medical staff and medical students were investigated by self-report questionnaire Depression, Anxiety and Stress Scale (DASS). DASS-21 questionnaire and the demographic data sheet were filled in by all participants. All statistical analyses were done using SPSS version 21.0. P-values less than 0.05 were considered statistically significant.

Results: Of the 886 participants in this survey, 554 (62.5%) were male and 332 (37.5%) were female, and the mean ± standard division (SD) age of subjects was 40.91±10.7 years. Among these participants, 241 (27.2%) were selected from community population, 221 (24.9%) were patients with COVID-19, 217 (24.5%) were medical staff and 207 (23.4%) were medical students. The mean score of stress, anxiety and depression in medical students and patients with COVID-19 was significantly higher than medical staff and community population ($P<0.05$). In overall, the score of anxiety level in male was higher than that in female (27.4±4.6 vs. 26.48±4.8, $P=0.006$), and the score of depression in unmarried participants was significantly higher than that in married group (27.5±4.8 vs. 26.7±4.6, $P=0.023$). In addition, the score of depression in female medical staff (27.08±4.6 vs. 25.33±4.3, $P=0.011$) and community population (26.6±4.3 vs. 25.3±4.3, $P=0.02$) was higher than that in male.

Conclusion: In COVID-19 pandemic, the severity of anxiety, stress and depression was high among Iranian population. Patients with COVID-19 and medical students who spent time with patients with COVID-19, with low experience than professional medical staff and community population were at high risk for mental illness. Continuous surveillance and monitoring of psychological distress for outbreaks should become routine as part of preparedness efforts worldwide.

Background

The novel coronavirus disease 2019 (COVID-19), formerly known as severe acute respiratory

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syndrome coronavirus 2 (SARS-CoV-2) was first detected in December 2019 in Wuhan City in China [1]. Currently, COVID-19 turned into pandemic as it affected more than 209 countries worldwide [2]. As a result of the rapidly increasing numbers of confirmed cases and deaths, both medical staff and the public have been experiencing psychological pressure and other health-related problems [3]. These concerns arise with all infections, including the influenza, severe acute respiratory syndrome (SARS) and Middle-East respiratory syndrome (MERS) that took place years ago. During the outbreak of these infections, several psychiatric comorbidities such as depression, panic attack, anxiety, psychomotor excitement, suicide and stress symptoms were reported [4-6]. However, the pandemic COVID-19 highlighted as a unique threat, rather than those, which has added to panic, stress, anxiety and the potential for depression because of fast transmission pattern, inadequate preparedness of health officials, the absence of a comprehensive and definitive treatment protocol or vaccination program to prevent this disease [7].

Pandemics can affects everyone in the community psychologically. However, healthcare workers and medical students, especially those in hospitals who care and treat of COVID-19 patients, are vulnerable to both high risk of infection and mental health problems. Research during previous SARS outbreak on healthcare workers have shown that many of them presented high levels of psychological distress, frequent concerns regarding their health and their families' health and worries about their functional ability [8-13]. In addition, the patient's population may need appropriate interventions in terms of psychiatric conditions due to isolated treatment and fear of death, which should be considered. Previous studies on people with diseases such as SARS and MERS have shown that there were psychological disorders and chronic fatigue in the survivors of these diseases [14, 15]. Moreover, depression and post-traumatic stress disorders (PTSD) have been reported to be as high as one year after illness [16]. To date, research on the psychological impact and mental health of the Iranian population during the COVID-19 pandemic is still lacking. Therefore, we conducted this cross-sectional survey for the first time to measure the prevalence and compare the severity of the psychological distress (stress, anxiety and depression) among community population, patients with COVID-19, medical staff and medical students in Iranian population. We hope our study findings will

provide data support for the target intervention on psychological health in Iran and different part of the world during pandemic.

Material And Methods

Study design and Participants

This cross-sectional survey was conducted to measure the prevalence and compare the severity of the psychological distress (stress, anxiety and depression) among community population, patients with COVID-19, medical staff and medical students in Iranian population from February to March 2020 in Tehran, Iran. The present study has been approved by the Ethics Committee of Baqiyatallah University of Medical Sciences, Tehran, Iran, with code IR.BMSU.REC.1398.442.

Of the 886 participants in this cross-sectional survey, 241 (27.2%) were selected from community population, 221 (24.9%) were patients with COVID-19, 217 (24.5%) were medical staff and 207 (23.4%) were medical students. This study included 241 subjects that selected from adults over the age of 18 who were interested in participating in the study also, could read and write and had no physical disability or mental disorder as community population group. Patients with COVID-19 were selected from who referred to Baqiyatallah Hospital, one of the main and referral centers for specialized diagnosis and treatment of patients with COVID-19 between February and March 2020 in Tehran, Iran. All patients with COVID-19 enrolled in this study were diagnosed according to World Health Organization interim guidance [17]. This study included 217 medical staff of Baqiyatallah Hospital, who treated patients with COVID-19 infection for at least a week in February and March 2020 and volunteered to participate in the study. Medical students included in the study randomly selected from the faculty of nursing and medicine that studied at Baqiyatallah University of Medical Sciences Tehran, Iran. All the medical students in the study were at internship period during which the students practice at university Hospital and work under supervision of residents and fully licensed staff physician. Therefore, medical students were selected to participate in this study who had worked with COVID-19 patients for at least one week.

Data collection

DASS-21 questionnaire and the demographic data sheet were filled in by all participants.

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Demographic variables included; age, gender and marital status. In addition, work experience (years) and experience working with COVID-19 patients (weeks) were recorded for medical staff and medical students. The objectives of the study were explained for all participants and informed consent was obtained from all. They were also assured of confidentiality

DASS-21 questionnaire

Mental health status was measured using the Depression, Anxiety and Stress Scale (DASS-21). This questionnaire was designed and validated by Lovibond in 1995 [18] to measure psychological distress among community with 21 items. DASS-21 is a different, simple, and approved instrument for assessing depression, anxiety, and stress both in clinical settings and in the community [19]. DASS is a short screening tool that measures depression, anxiety, and stress by a 21-item self-report questionnaire. For each disorder, seven questions are considered, and the final score is obtained by the total score of the questions related to it. Each question was scored using a Likert-scale, ranging from 0 (did not apply to me at all/never) to three (applied to me very much, or most of the time/almost always). Higher scores indicated a higher level of disorder by a specific classification scoring. Individuals are classified as normal, mild, moderate, severe, and extremely severe based on their responses. Comparing the results from DASS-21 with the diagnosis of psychiatric interviews showed the sensitivity and specificity of 75% to 89% for this tool and its potential for accurate screening of depression, anxiety, and stress [20, 21]. The reliability and validity of the translated version of the Persian questionnaire was confirmed for an Iranian population. A study by Sahebi et al. [22] on 970 students and armies, the authors reported the translated questionnaire is comparable with the original one and there is high internal correlation a Cronbach's alpha of 0.77, 0.79 and 0.78 for depression, anxiety and stress subscales, respectively, according to this questionnaire. In addition, the study by Moradipanah et al. [23] in Iran has also reported a Cronbach's alpha 0.94 for depression 0.92 for anxiety and 0.82 for stress.

Statistical analysis

Categorical variables were described as frequency rates and percentages, and continuous variables were described using mean ± standard deviation (SD) values. Means for continuous variables were

compared using independent group t-tests. The scores of the DASS subscales for each group were expressed as mean and standard deviation. ANCOVA test was used to compare the severity of stress, anxiety and depression between the four groups of study, adjusting with age as a covariate. Also, the mean score of stress, anxiety and depression were compared between the groups two by two in which (Tukey) post hoc test. All tests were two-tailed, with a significance level of $P<0.05$. Statistical analysis was performed using R version 3.6.1 software.

Results

Demographic and psychological distress levels in all participants

Of the 886 participants in this survey, 554 (62.5%) were male and the mean ± SD age of subjects was 40.91±10.7 years (range: 20-74 years). Regarding their marital status, 528 (59.6%) of the participants were married and 358 (40.4%) of them were single. In overall, the prevalence of mild stress, moderate stress, severe and extremely severe stress were 26 (2.9%), 336 (41.3%), 431 (48.6%) and 63 (7.1%), respectively. In terms of anxiety the prevalence of moderate, severe and extremely severe were 1 (0.1%), 23 (2.6%) and 862 (97.3%), respectively. The prevalence of moderate depression, severe and extremely severe depression was 76 (8.6%), 370 (41.8%) and 440 (49.7%), respectively. The results show that the majority of patients had extremely severe anxiety 862/886 (97.3%) and the mean score of anxiety level in male was higher than that in female (27.4±4.6 vs. 26.48±4.8, $P=0.006$, 95% CI: 0.27-1.56). While, in terms of stress ($P=0.446$) and depression ($P=0.774$) did not find any statistical significant differences between male and female. In addition, the average score of depression in unmarried participants was significantly higher than that in married group (27.5±4.8 vs. 26.7±4.6, $P=0.023$, 95% CI: 0.11-1.38). However, the mean score of stress and anxiety levels did not differ between married and unmarried participants ($P>0.05$).

Demographic and psychological distress levels in four groups of study

Among these participants, 241 (27.2%) were selected from community population, 221 (24.9%) were patients with COVID-19, 217 (24.5%) were medical staff and 207 (23.4%) were medical students. Demographic characteristic and severity of psychological distress of participants in four groups of study are presented in Table 1.

ANCOVA test was used to compare the severity of stress, anxiety and depression between the four groups of study (Table 2), and the results showed that the significantly differences between mean score of stress, anxiety and depression in four groups of study ($P<0.001$). In addition, the mean score of stress, anxiety and depression were compared between the groups two by two in which (Tukey) post hoc test. Results showed that the mean scores of stress, anxiety and depression in medical students and patients with COVID-19 were significantly higher than medical staff and community population ($P<0.05$). Moreover, the average score of depression in medical students was significantly higher than that in patients with COVID-19 (29.36±4.4 vs. 28.07±5.06, $P=0.031$, 95% CI: 0.08-2.5). While, in terms of stress and anxiety did not find any statistical significant differences between medical students and patients with COVID-19 ($P>0.05$).

The average score of depression in female medical staff (F/M: 27.08±4.6 vs. 25.33±4.3, $P=0.011$, 95% CI: 0.39-3.08) and female community population (F/M: 26.6±4.3 vs. 25.3±4.3, $P=0.02$, 95% CI: 0.21-2.47) was higher than that in male. However, the marital status had not affected the level of stress, anxiety and depression of patients in any group ($P>0.05$). Comparison the psychological distress levels in four groups of study according to gender and marital status are presented in Table 3. In terms of age, the mean score of depression was significantly higher in group of community population under 40 years old than that in community population over 40 years old (27.92±4.5 vs. 25.90±4.3, $P=0.033$, 95% CI: 0.169-3.86). However, due to age, we did not see a significant difference between the other groups in terms of stress and anxiety levels ($P>0.05$).

Discussion

To our knowledge, this is the first study to report that prevalence and compare the severity of the stress, anxiety and depression among four groups of Iranian society. The main results of the present study indicate that medical students who had worked with COVID-19 patients for at least one week and patients with COVID-19 had the significantly higher score of stress, anxiety and depression compare with medical staff and community population ($P<0.05$), this suggests that they would be the main targets of psychiatric assessment and care. In overall, the score of anxiety level in male was higher than that in female ($P=0.006$), and the score of depression in unmarried participants was

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significantly higher than that in married group (P=0.023). In addition, the score of depression in female medical staff (P=0.011) and community population (P=0.02) was higher than that in male. Previous studies have shown an association between epidemics and mental disorders during the spread of infections such as SARS and MERS infection [24, 25]. A study of Hawryluck et al. [4] showed that isolation and quarantine during the outbreak are stressful; they found that some subject due to quarantine for SARS in Canada displayed symptoms of PTSD (28.9%) and depression (31.2%). Al-Najjar et al. [26] in a study examining the psychological reactions of adults to the MERS epidemic in western Saudi Arabia, they found that anxiety was significantly increased by increasing susceptibility to infection and social behaviors associated with travel and being in public places. Lee et al. [27] evaluated the psychological impacts of the MERS outbreak and found that PTSD symptoms were very high among hospital staff even many years after the outbreak.

In terms of the psychological impact of COVID-19 pandemic on society, there are not many studies and only a few studies have been conducted in China [28-30]. In a cross-sectional study by Wang et al. [31] psychological impacts, depression, stress, and anxiety was evaluated on 1210 participants from 194 cities in China at the beginning of the COVID-19 outbreak and results showed that 53.8% of these people experienced severe psychological impacts of the outbreak. Moreover, 16.5%, 28.8%, and 8.1% of the respondents reported moderate to severe levels of depression, anxiety, and stress, respectively. Moreover, in a cross-sectional observational study by Xiao et al. [32] on 180 medical staff, levels of anxiety, self-efficacy, stress, sleep quality, and social support were measured and the results showed that medical staff in China who were treating patients with COVID-19 infection had high levels of anxiety, stress, and self-efficacy that were dependent on sleep quality and social support.

The results of this study and all previous studies have shown that the prevalence of psychological trauma due to the prevalence of infectious diseases in society is very significant. Infectious pandemics can cause disruptions on social and individual on many levels [33]. COVID-19 imposes irreversible psychological impacts on all groups of community members, such as general population, health care workers and students due to the commuting restrictions, fear of suffering from the virus,

anxiety about closure of schools and businesses, depression following losing friends and family and fear of death [34-36]. Furthermore, the COVID-19 pandemic has become an additional economic and social stress that has made life miserable for the head of the household. As can be seen in the results of the study, the score of anxiety level in men was significantly higher than that in women.

The results of this study revealed that the patients with COVID-19 and medical students who spent time with patients with COVID-19 are the main targets of psychiatric assessment and care. Higher psychological distress in medical students can be related to the physical and emotional exhaustion due to a high-pressure health care system, rapid changes in medical information and procedures, perception of risk to themselves, lifestyle impacted by outbreaks, fear of inadequate medical equipment such as masks and gloves and personal vulnerability due to poor experience compared to fully licensed staff physicians. In patients with COVID-19, these can be related to the fear of severe disease consequences and the contagion, isolation treatment, loss of trust in health services and fear of death. Consequently, they may experience loneliness, denial, anxiety, depression, insomnia, and despair, which may lower treatment adherence. Some of these cases may even have increased risk of aggression and suicide. In addition, the limited knowledge of the COVID-19 and the overwhelming news may cause anxiety and fear in the public. The general public may also experience boredom, frustration, and irritability under the isolation measures [29]. Therefore, during this time of a global pandemic, interventions to promote mental well-being for all community need to be implemented, with particular attention to patients with COVID-19 and first-line of health professional.

To our knowledge, this is the first report of psychological distress among Iranian population during pandemic of COVID-19. The main strengths of the present investigation were the comparison the severity of this psychological distress among four groups of society and the large sample size in each group is of great importance. However, further researches are needed to determine the psychological impact of the pandemic on Iran's population and worldwide.

Conclusion

This study showed the high severity of anxiety, stress and depression among Iranian subpopulations during pandemic of COVID-19. The patients with COVID-19 and medical students who spent time with

patients with COVID-19 are the main targets of psychiatric assessment and care. Increasing public awareness of the disease, building trust in the media, and providing information on patients' recovery can be reduce psychological distress in society. In addition, based on experiences of SARS outbreak, some patients and health professionals would be traumatized by the COVID-2019 outbreak and still suffer from persistent psychiatric symptoms even after the outbreak. So, we should expect long-term negative psychological outcomes as post-traumatic stress disorder (PTSD) among COVID-19 survivors and healthcare workers. Therefore, designing psychological interventions is essential for improving mental health during and after the pandemic.

Declarations

Ethics approval and consent to participate: The present study has been approved by the Ethics Committee of Baqiyatallah University of Medical Sciences, Tehran, Iran, with code IR.BMSU.REC.1398.442.

Consent for Publication: Written informed consent was obtained from all participants.

Availability of data and material: All data collected and analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

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Authors' contributions: A.V-A developed the study concept. All authors contributed to the study design. Testing and data collection were performed by A. V-A, M. SM and M.R. The data analysis and interpretation was performed by S.A and S.Sh under the supervision of M-A.P. S.A drafted the manuscript, and M-A.P and A.V-A provided critical revisions. All authors approved the final version of the manuscript for submission.

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List Of Abbreviations

COVID-19: Coronavirus Disease 2019, DASS: Depression, Anxiety and Stress Scale, PTSD: post-

traumatic stress disorders, SARS: severe acute respiratory syndrome, MERS: Middle-East respiratory syndrome

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Tables

Table 1: Demographic characteristics and severity of psychological distress of participants in four groups of study

Variables	Community population (n=241)	Patients with COVID-19 (n=221)	Medical staff (n=217)	Medical stud (n=207)
Age				
Mean ± SD	49.16±8.01	45.90±7.77	39.57±6.71	27.37±3.92
(Range)	(37-74)	(33-71)	(28-62)	(20-38)
Gender (%)				
Male	111 (51.2)	143 (69.1)	111 (51.2)	143 (69.1)
Female	106 (48.8)	64 (30.9)	106 (48.8)	64 (30.9)
Marital status (%)				
Married	151 (62.7)	99 (44.8)	158 (72.8)	120 (58)
unmarried	90 (37.3)	122 (55.2)	59 (27.2)	87 (42)
Stress (%)				
Mild	5 (2.1)	1 (0.5)	19 (8.8)	1 (0.5)
Moderate	106 (44)	94 (42.5)	103 (47.5)	63 (30.4)
Severe	118 (49)	103 (46.6)	84 (38.7)	128 (60.9)
Extremely severe	12 (5)	23 (10.4)	11 (5.1)	17 (8.2)
Anxiety (%)				
Moderate	0	0	1 (0.5)	0
Severe	10 (4.1)	6 (2.7)	5 (2.3)	2 (1)
Extremely severe	231 (95.9)	215 (97.3)	211 (97.2)	205 (99)
Depression (%)				
Moderate	25 (10.4)	16 (7.2)	32 (14.7)	3 (1.4)
Severe	124 (51.5)	85 (38.5)	101 (46.5)	60 (29)
Extremely severe	92 (38.2)	120 (54.3)	84 (38.7)	144 (69.6)

Table 2: Comparison of anxiety, stress and depression scores based on DASS-21

questioner between 4 groups of study

Variables	Community population (n=241)	Patients with COVID-19 (n=221)	Medical staff (n=217)	Medical stud (n=207)
Stress				
Mean ± SD	27.34±4.37	28.59±5.18	26.23±5.62	28.99±4.53
(Range)	(18-38)	(18-44)	(14-42)	(18-40)
Anxiety				
Mean ± SD	26.04±4.52	27.62±5.12	26.15±4.24	28.56±4.67
(Range)	(16-38)	(16-42)	(14-40)	(16-42)
Depression				
Mean ± SD	26.09±4.39	28.07±5.06	26.18±5.09	29.36±4.42
(Range)	(16-40)	(16-46)	(14-42)	(18-42)

* $P<0.05$ was considered statistically significant. In addition, the mean score of stress, anxiety and

depression were compared between the groups two by two in which (Tukey) post hoc test.

Table 3: Comparison the psychological distress levels in four groups of study according to

gender and marital status

| Variables | Gender | | P-value | Marital status | |
	Male	Female		Married	Unm
Stress (Mean ± SD)					
Community population	27.21±4.5	27.43±4.2	0.695	27.21±4.4	27.58
Patients with COVID-19	28.47±5.1	30.12±6.9	0.209	28.42±5.1	28.78
Medical staff	26.25±5.5	26.21±5.7	0.953	25.91±5.5	27.08
Medical students	28.71±4.4	29.63±4.7	0.182	29.20±4.31	28.71
Total participants	27.87±4.9	27.60±5.1	0.446	27.50±5.1	28.11
Anxiety (Mean ± SD)					
Community population	26.01±4.5	26.06±4.5	0.908	25.85±4.6	26.4
Patients with COVID-19	27.68±5.1	27.06±5.8	0.634	27.33±5.1	27.87
Medical staff	26.50±4.1	25.79±4.3	0.217	25.86±4.1	26.95
Medical students	28.63±4.2	28.41±5.6	0.752	28.62±4.5	28.48
Total participants	27.40±4.6	26.48±4.8	0.006*	26.75±4.6	27.50
Depression (Mean ± SD)					
Community population	25.29±4.3	26.63±4.3	0.020*	26.26±4.1	25.82
Patients with COVID-19	28.11±4.8	27.56±7.4	0.720	28.48±5.4	27.74
Medical staff	25.33±5.3	27.08±4.6	0.011*	26.57±4.9	25.15
Medical students	29.45±4.4	29.16±4.3	0.655	29.02±4.3	29.84
Total participants	27.41±5.1	27.31±4.7	0.774	27.40±4.8	27.34

* $P<0.05$ was considered statistically significant