Psychological Problems Among Patients With Chronic Medical Disorders During the COVID-19 Pandemic

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Abstract- The aim of the current study was to investigate the rates of stress, anxiety, and depression among people in south Iran (a group from the general population without a history of any chronic medical problems, and cohorts of patients were recruited from epilepsy, diabetes, and cardiac disease clinics). We surveyed a sample of people during September 2020: a group of the general population without a history of any chronic medical problems, people with epilepsy, people with diabetes mellitus (DM), and people with cardiac problems. The survey included four general questions and two COVID-19 specific questions [contracting COVID-19, relatives with COVID-19]. Furthermore, the survey included the DASS (Depression-Anxiety-Stress Scale)-21 questionnaire. 487 people were surveyed (154 people with epilepsy, 127 patients with DM, 98 people with cardiac problems, and 108 healthy individuals). Among people without a history of any chronic medical illnesses, 14% had any psychological problems. The highest rates of depression and anxiety were observed among patients with DM (52% and 57%, respectively), and the highest rate of increased stress was observed among people with cardiac problems (40%). The existence of any underlying medical problem was significantly associated with higher rates of depression, anxiety, and stress among the participants. While many patients with underlying chronic medical conditions suffer from depression, anxiety, and stress during the COVID-19 pandemic, we cannot establish a cause and effect relationship between the COVID-19 pandemic and increased psychological problems among these patients.
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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has caused a catastrophic pandemic (COVID-19) since late 2019 (1). This virus is highly contagious and has a high potential for human-to-human transmission. It may cause a severe and fatal illness characterized by acute respiratory distress syndrome, multi-organ failure, and death (1). However, in addition to the physical health hazards of this viral infection, the psychological impacts of the COVID-19 pandemic on different groups of people should also be taken into account seriously (2,3). Mental health issues such as stress, anxiety, depression, frustration, and uncertainty have emerged progressively during the COVID-19 outbreak. Similarly, studies performed on the psychological impacts of previous infectious outbreaks, such as the severe acute respiratory syndrome (SARS), have found significant psychological problems (e.g., anxiety, depression, or stress) among the public during the outbreak (4).

Major risk factors for a more severe illness due to

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COVID-19 have been identified as older age and underlying chronic medical disorders, among others (1,5,6). Cerebrovascular diseases (odds ratio [OR]: 3.66), chronic obstructive pulmonary disease (OR: 2.39), cardiovascular diseases (OR: 2.84), diabetes mellitus (DM) (OR: 2.78), and hypertension (OR: 2.24) have been associated with severe COVID-19 (5). Therefore, it is plausible to assume that people with chronic medical problems are also at higher risk of experiencing undue stress, anxiety, and depression compared with that in the general public due to the fear of contracting a more severe illness and its potential consequences.

The aim of the current study was to investigate the rates of stress, anxiety, and depression among people in south Iran. We investigated four groups of people in order to clarify the psychological impacts of the COVID-19 pandemic on different groups of patients with underlying medical problems; a group from the general population without a history of any chronic medical problems, patients with epilepsy, patients with DM, and patients with cardiac problems. We hypothesized that the rates of stress, anxiety, and depression are significantly higher among patients with the chronic medical condition compared with those among healthy individuals.

Materials and Methods

Participants

In this cross-sectional study, we surveyed four groups of people during September 2020: a group of the general population from Shiraz (a major city in south Iran) without a history of any chronic medical problems selected randomly, patients with epilepsy (referring consecutively to the neurology clinic at Shiraz University of Medical Sciences), patients with DM (referring consecutively to the DM clinic at Shiraz University of Medical Sciences), and patients with chronic cardiac problems (referring consecutively to the cardiology clinic at Shiraz University of Medical Sciences). The inclusion criteria were adults ($\geq$ 18 years) and literacy (> 5 years of education). The exclusion criteria included intellectual disability and unwillingness to participating in the study.

Instruments

The survey included four general questions [age, sex, education (school vs. college), and medical/psychiatric problems]. It also included two COVID-19 specific questions [contracting COVID-19 (self-declared), relatives (i.e., spouse, children, siblings, parents) with COVID-19 (self-declared)]. Furthermore, the survey included the DASS (Depression-Anxiety-Stress Scale)-

21 questionnaire (Appendix 1). In this short version of the DASS questionnaire, each item (depression, anxiety, and stress) is assessed by seven questions. The DASS-21 scale has been translated and validated in the Farsi language (7).

Statistical analyses

Statistical analyses were performed using the independent *t*-test, Fisher's Exact test, Pearson chi-square test, and Bonferroni correction test. Moderate, severe, or extremely severe depression/anxiety/stress was considered as the existence of a psychological burden (*vs.* normal and mild scores). Variables with a *P*<0.1 in univariate tests were assessed in a logistic regression model. Odds ratio (OR) and 95% confidence interval (CI) were calculated. A *P* (2-sided) less than 0.05 was considered significant.

Results

The total number of the participants was 487 people [154 patients with epilepsy (66 men and 88 women), 127 patients with DM (40 men and 68 women), 98 patients with cardiac problems (54 men and 44 women), and 108 healthy individuals (66 men and 88 women)]. The mean age of the participants was 37 years (standard deviation: 16 years) (range: 18 to 97 years). The mean age of the groups differed significantly (27±9 years in controls, 33±12 years in the epilepsy group, 43±18 years among patients with DM, and 50±15 years among those with cardiac problems; *P*=0.0001). They included 271 females and 216 males. The sex ratios of the groups were not significantly different (*P*=0.07).

Moderate, severe, or extremely severe depression was observed among 33% of the participants (160 people). Moderate, severe, or extremely severe anxiety was observed among 41% of the participants (201 people). Moderate, severe, or extremely severe stress was observed among 29% of the participants (139 people). Table 1 shows the factors associated with depression/anxiety/stress in univariate analysis. The existence of an underlying medical disorder was consistently associated with higher rates of depression, anxiety, and stress among the studied participants (compared with that in healthy individuals). Among people without a history of any chronic medical illnesses, these rates were 14% for all three psychological problems (depression/anxiety/stress). The highest rates of depression and anxiety were observed among patients with DM (52% and 57%, respectively); patients with epilepsy had a risk less than those with DM and more than

patients with cardiac problems. The highest rate of increased stress was observed among patients with cardiac problems (40%); patients with epilepsy had a risk lower than those with DM and also patients with cardiac problems.

We then analyzed the association between depression/anxiety/stress and variables with a *P*<0.1 in a binary logistic regression model. The models that were generated by regression analysis were significant (*P*=0.0001). Table 2 shows the results of these analyses. The existence of an underlying medical problem was significantly associated with higher rates of depression, anxiety, and stress among the participants (with robust ORs). Female sex was significantly associated with higher rates of depression and anxiety (with modest ORs). A history of relatives with COVID-19 was significantly associated with higher rates of depression (with a modest OR) (Table 2).

Table 1. Factors associated with depression/anxiety/stress in univariate analysis

	Depression			
	With (N=160)	Without (N=327)	*P*	df
Sex (Female: Male)	100: 60	171: 156	0.041	1
Mean age ± Standard deviation (years)	40 ± 16	36 ± 16	0.038	485
Education (college)	58 (36%)	131 (40%)	0.428	1
Medical problem (none, epilepsy, diabetes, cardiac)	15 (14%), 50 (32%), 66 (52%), 29 (30%)	93 (86%), 104 (68%), 61 (48%), 69 (70%)	0.0001	3
Relatives with COVID-19	36 (23%)	50 (15%)	0.058	1
History of COVID-19	13 (8%)	29 (9%)	0.865	1
Anxiety				
	With (N=201)	Without (N=286)	*P*	df
Sex (Female: Male)	121: 80	150: 136	0.096	1
Mean age ± Standard deviation (years)	39 ± 16	36 ± 16	0.073	485
Education (college)	72 (36%)	117 (41%)	0.257	1
Medical problem (none, epilepsy, diabetes, cardiac)	15 (14%), 78 (51%), 73 (57%), 35 (36%)	93 (86%), 76 (49%), 54 (43%), 63 (64%)	0.0001	3
Relatives with COVID-19	41 (20%)	45 (16%)	0.187	1
History of COVID-19	14 (7%)	28 (10%)	0.326	1
Stress				
	With (N=139)	Without (N=348)	*P*	df
Sex (Female: Male)	84: 55	187: 161	0.190	1
Mean age ± Standard deviation (years)	41 ± 16	36 ± 16	0.003	485
Education (college)	44 (32%)	145 (42%)	0.039	1
Medical problem (none, epilepsy, diabetes, cardiac)	15 (14%), 38 (25%), 47 (37%), 39 (40%)	93 (86%), 116 (75%), 80 (63%), 59 (60%)	0.0001	3
Relatives with COVID-19	31 (22%)	55 (16%)	0.114	1
History of COVID-19	12 (8%)	30(9%)	1.000	1

*After Bonferroni correction, a significant predictive value is 0.008. The significant *P* is in bold. df: degree of freedom

Table 2. Factors associated with depression/anxiety/stress in logistic regression models (compared with healthy individuals)

	Depression			
	Odds Ratio	95% confidence interval	*P*	df
Medical problem (epilepsy/ diabetes/ cardiac)	3.13/ 6.96/ 2.89	1.63-6.03/ 3.49-13.93/ 1.32-6.30	0.001/ 0.0001/ 0.007	1
Sex (Female)	1.72	1.14- 2.59	0.010	1
Relatives with COVID-19	1.71	1.03-2.85	0.038	1
Age			0.731	1
Anxiety				
Medical problem (epilepsy/ diabetes/ cardiac)	6.52/ 8.48/ 3.56	3.44-12.36/ 4.27-16.85/ 1.67-7.58	0.0001/ 0.0001/ 0.001	1
Sex (Female)	1.51	1.02- 2.36	0.038	1
Age			0.756	1
Stress				
Medical problem (epilepsy/ diabetes/ cardiac)	1.90/ 3.25/ 3.56	0.95-3.77/ 1.61-6.57/ 1.64-7.69	0.066/ 0.001/ 0.001	1
Age			0.611	
Education (college)			0.525	

Discussion

In this cross-sectional study, we observed that many patients with various underlying chronic medical conditions suffer from depression, anxiety, and stress during the COVID-19 pandemic. In a national face-to-face household survey from Iran that was published five years ago, the most common category of psychiatric disorders was any anxiety disorder (15.6%), and the most prevalent particular disorder was major depressive disorder (12.7%) (8). These rates are comparable with what we observed among the healthy individuals in the current study (14% for both depression and anxiety). Furthermore, in studies from the pre-COVID era in Iran, the prevalence of depression among Iranian patients with DM was estimated to be 62% (95% confidence interval [CI]: 57-67), and the prevalence of anxiety among Iranian patients with DM was estimated to be 65% (95% CI: 42-82) (9). The prevalence of depression among cardiovascular patients in Iran was estimated to be 47% (95% CI: 38-56) in one study (10). Finally, in one cross-sectional hospital-based study of 74 adults with epilepsy, 26 (35%) patients had symptoms of depression (11). These rates are also comparable with what we observed among patients with DM, cardiovascular disorders, and epilepsy in the current study.

Therefore, while we observed that many patients with underlying chronic medical conditions (i.e., epilepsy, DM, and cardiovascular disorders) suffer from depression, anxiety, and stress during the COVID-19 pandemic, we cannot establish or even hypothesize a cause and effect relationship between COVID-19 pandemic and increased psychological burden and problems among these patients based on the current study. However, the prevalence of depressive and anxiety symptoms was reported to be significantly higher in the UK, relative to pre-pandemic epidemiological data (12). This cross-cultural difference should be studied more in the future.

We can provide the following speculation to explain our counterintuitive findings described above. The general public in Iran has already been under tremendous psychological pressure due to various reasons (e.g., economic, political, etc.) (13). On top of that, patients with chronic medical problems (e.g., epilepsy, DM, etc.) in Iran may suffer from psychological disorders as a comorbidity to their underlying illness (as any other person elsewhere in the world) (14) or because of the existing undue pressure due to social reasons (e.g., shortage of their drugs due to economic sanctions) (13).

The interactions between chronic diseases and psychological problems have been described in the literature (15). However, why the COVID-19 pandemic has not (significantly) worsened the already high rates of psychological problems in Iran is an intriguing finding that should be explored in future studies.

This study has some limitations. This was a cross-sectional study, and we did not have the pre-pandemic epidemiological data or mental health histories of the participants. In addition, the groups differed with respect to their age, and this might have affected the results. Furthermore, we did not investigate the drug history (e.g., antidepressants) of the patients. Finally, the timing between getting ill with COVID-19 (in the affected people) and completing these questionnaires was not recorded.

We can conclude that many patients with various underlying chronic medical conditions suffer from depression, anxiety, and stress during the COVID-19 pandemic. The observed high rates of depression, anxiety, and stress in Iran (during the COVID-19 pandemic or at any other time), particularly among patients with underlying medical problems, are alarming and should be taken into account seriously. These psychological problems (depression, anxiety, and stress) are not only associated with impaired quality of life (16) but also may affect the health status of the people and even increase the risk of premature death (17). There are various interventions available that may help reduce or prevent depression, anxiety, and stress among the affected people and also those at risk; health promotion interventions, exercise, and yoga, are some examples (18-20). Having said that, the key element is to screen the at risk populations and detect any psychological problem as soon as possible.

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