RESEARCH ARTICLE

The effect of the Covid-19 pandemic stressor on the state-trait anxiety level

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Abstract

Objectives: To evaluate the effect that the coronavirus diseases-2019 pandemic will likely have on public and its impact on the state-trait anxiety level of the masses.

Methods: The cross-sectional study was conducted from May 28 to June 5, 2020, in Turkey, with Kayseri province being the first ring of the chain, and comprised adult citizens of either gender living in Turkey during the pandemic period who could use online technologies. The Impact of Event Scale-Revised was used to determine the effects of the pandemic on the public, and the State Anxiety Inventory and the Trait Anxiety Inventory were used to determine the anxiety level of the public. Data was analysed using SPSS 25 and Stata 14.

Results: Of the 1507 subjects, 862(57.2%) were females and 645(42.8%) were males. The largest age group was 18-29 years with 573(38%) sucjects, while the smallest group was aged >60 years with 53(3.5%) subjects. The mean score of State Anxiety Inventory was 39.3±11.3 and mean Trait Anxiety Inventory score was 42.8±8.7, while the Impact of Event Scale-Revised mean score was 27.4±14.5. Each one unit increase in the Impact of Event Scale-Revised total score increased state anxiety score 1.10 times and trait anxiety score 1.07 times.

Conclusions: Increasing age had a protective effect on state-trait anxiety. Consequently, an increase in Impact of Event Scale-Revised score led to an increase in the anxiety level.

Keywords: COVID-19, Anxiety level, Impact of event. (JPMA 72: 679; 2022)

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Introduction

Coronavirus disease-2019 (COVID-19) is a newly recognised infectious disease that first appeared in Wuhan, China, and later caused a global pandemic.[1] This disease, which spread rapidly from a single city to the whole country in only 30 days in Chine,[2] has been maintaining its impact in many countries, including the United States, Brazil, Russia, India, Spain, France, Italy, England and Turkey. COVID-19 has become a public health emergency of an international concern since it has spread rapidly worldwide.[3] At the same time, the World Health Organisation (WHO) declared COVID-19 a pandemic as the sixth international public health emergency on January 30, 2020, after H1N1 (2009), polio (2014), Ebola in South Africa (2014), Zika (2016) and Ebola in the Democratic Republic of Congo (2019).[4]

COVID-19 pandemic has been a stressor due to the lack of effective vaccine and the fact that currently it is treated only symptomatically because it is a new viral infection.[5] Due to the rapidly increasing number of people infected with COVID-19 worldwide and the high rate of mortality, a wave of fear and anxiety has marked its spread.[6] In this environment, the only strategy against the COVID-19 pandemic is to be careful about social distancing in order to decrease the contact with sensitive and infectious people.[7] The governments of many countries affected by the pandemic have started social distancing precautions in order to decelerate the spread of the infection, limit the deaths, and decrease the pressure on healthcare providers.[8] Turkey, which is one of the countries practising social distancing precautions, has taken precautions for aginst the pandemic, such as stopping international flights, intercity travels restrictions, closing border gates, suspending education, restricting access to places where people gather, like restaurants, sports centres and hairdressers, lockdown for people aged >65 years and <20 years, and quarantine for 14 days.

As a result of these measures, which are important in the fight against the 19 pandemic, individual and social difficulties have been increasing.[9] Existence of some restrictions due to the pandemic can affect people economically and psychologically.[10] Studies have revealed that isolation and quarantine periods have short- and long-term negative psychological effect on people, like anxiety and post-traumatic stress.[11-13]

The psychological impact of various past pandemics on societies has been investigated.[11,12,14] Currently, no study has been found related ot the the psychological impact of

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the COVID-19 pandemic on public and the state of anxiety. The levels of state anxiety comprise subjective and temporary tension, nervousness and anxiety feelings, while trait anxiety is a state in which anxiety tendency becomes a personal characteristic over time.[15]

The current study was planned to measure the impact of the pandemic on individuals in Turkish society, and to determine the state-trait anxiety levels.

Subjects and Methods

The cross-sectional study was conducted from May 28 to June 5, 2020, in Turkey, with Kayseri province being the first ring of the chain. The study period coincided with restrictions during the pandemic in Turkey.

After approval from the Kayseri University ethics review committee and the Scientific Research Platform of Directorate General for Health Services, Ministry of Health, Turkey, the sample size was calculated using the NCSS-PASS programme[16] in the light of literature. The smallest sample size was determined at 99% power and type 1 error level 0.001. in determining the sample size. The sample was raised from 66 provinces in Turkey using the snowball sampling technique, with Kayseri province being the starting point.

Those included were adult citizens of either gender living in Turkey during the pandemic period who could use online technologies. Those with any physical and mental diseases that could affect the outcome were excluded. The online questionnaire was accompanied by an obligatory informed consent form before the participants could access the questionnaire. The online questionnaires were answered by those aged >60 years either by themselves or with the support of their relatives when needed. The income levels of the participants were determined based on their statements.

The data-collection tool was created in Google Forms to minimise face-to-face communication during the pandemic period. The questionnaire had four parts. The individuals were asked about basic socio-demographic characteristics, physical symptoms during the pandemic, precautions taken, COVID-19 test and quarantine details, contact existence with the individuals having COVID-19 diagnosis, difficulties encountered and social support state.

Also used was the Turkish version[17] of the 22-item Impact of Event Scale-Revised (IES-R).[18] It has 3 subscales; intrusion, avoidance and hyperarousal. The score obtained from the 5-point likert scale ranges from 0 = not at all and 4 = extremely. The total score ranges 0-88.

The state and trait anxiety levels of the participants were assessed using the State-Trait Anxiety Inventory (STAI) was used.[19] It has been adaptated into Turkish and validity and reliability studies have been conducted.[20] The 20-item tool is scored on a likert scale ranging from 1 to 4 points. Total score ranges 20-80.

Data was analysed using SPSS 25 and Stata 14. Descriptive characteristics were presented as frequencies and percentages. Mean ± standard deviation, median and interquartile range (IQR) were calculated for relevant data. Univariate and multivariate ordinal logistic regression analysis was also done. In the univariate analysis, the relation of the variables of IES-R subscale and total scores, sociodemographic characteristics and health state with state-anxiety scale scores was tested. The sociodemographic characteristics and health status variables that were found to be significant were tested together with the total score of IES-R in the multivariate ordinal logistic regression model. Results obtained from univariate and multivariate analysis were expressed as odds ratio (OR) with 95% confidence interval (CI). Structural Equation Modeling (SEM) was created between the IES-R scores and STAI scores. In the created model, an anxiety latent variable formed by the compound of state and trait anxiety variables was included in the analysis. Variables indicating a significant relationship on state and trait anxiety scores as a result of multivariate analysis and IES-R scores were analysed using SEM. In the model creation, a latent variable was created for sociodemographic characteristics and health state variables. The relation between IES-R score and anxiety score was tested in the model, and the direct and indirect effect of the sociodemographic characteristics and health state variables on anxiety was also determined. The results obtained from the model were presented through goodness of fit summary values.

Results

Of the 1507 subjects, 862(57.2%) were females and 645(42.8%) were males. The largest age group was 18-29 years with 573(38%) sucjects, while the smallest group was aged >60 years with 53(3.5%) subjects (Table-1).

Overall, 258(17.1%) participants had a chronic disease, and 192(12.7%) had received a psychiatric treatment. COVID-19 symptoms, such as fever, sore throat, headache and cough, in the preceding 14 days was reported by 49(3.3%) subjects, 105(7%) had consulted a doctor or had visited a hospital, 137(9%) had quarantined, 57(3.8%) had got themselves tested for COVID-19, and 75(5%) had a close contact with individuals having COVID-19 (Table-2).

The mean score of State Anxiety Inventory was 39.3±11.3

Table-1: Demographic and socio-cultural characteristics of the subjects.

Characteristics	N	%
Age Group		
18-29 years	573	38
30-39 years	403	26.7
40-49 years	325	21.6
50-59 years	153	10.2
60 years and above	53	3.5
Gender		
Female	862	57.2
Male	645	42.8
Marital Status		
Single	624	41.4
Married	883	58.6
Educational Status		
Before High School	64	4.2
High School	182	12.1
University	1261	83.7
Income Status		
None or below 269 USD	421	27.9
Between 269-672 USD	642	42.6
Above 672	444	29.5
Household Size		
1-2 people	246	16.3
3-5 people	1144	75.9
6 and above	117	7.8
Residence		
Village or district	270	17.9
City	211	14
Metropolitan	1026	68.1
Residence Type		
Apartment	1243	82.5
House	264	17.5

USD: United States dollar.

Table-2: Participants' health state and behaviour.

Characteristics	N	%
Do you have a chronic disease?		
Yes	258	17.1
No	1249	82.9
Have you had a psychiatric treatment before?		
Yes	192	12.7
No	1315	87.3
Did you have fever, sore throat, headache and cough in the last 14 days?		
Yes	49	3.3
No	1458	96.7
Did you consult a doctor or hospital in the last 14 days?		
Yes	105	7
No	1402	93
Have you been tested for COVID-19?		
Yes	57	3.8
No	1450	96.2
Have you been in quarantine in the last 14 days?		
Yes	137	9.1
No	1370	90.9
How would you evaluate your health condition?		
Bad/Very bad	5	0.3
Moderate	455	30.2
Good/Very good	1047	69.5
Have you had close contact with someone who is carrying COVID-19?		
Yes	75	5
No	1432	95
How often did you use a mask outside during the pandemic period?		
Never	16	1.1
Rarely	56	3.7
Sometimes	51	3.4
Usually	307	20.4
Always	1077	71.5
How long do you stay at home to avoid the pandemic?		
0-9 hours	115	7.6
10-19 hours	486	32.2
20-24 hours	906	60.1

COVID-19: Coronavirus disease-2019.

and mean Trait Anxiety Inventory score was 42.8±8.7, while the IES-R mean score was 27.4±14.5 (Table-3).

Each one unit increase in the IES-R total score increased state anxiety score 1.10 times and trait anxiety score 1.07 times. As age increased, the anxiety decreased significantly, while being a female increased the effect on both state and trait anxiety levels. Various factors affecting state-trait anxiety level were subjected to logistic regression analysis (Table-4).

The SEM model showed a descriptive coefficient of 0.712, indicating an adequate level of fit. Socio-demographic characteristics, including age, gender and income variables had a significant direct effect on nxiety ($p<0.001$). Increasing age and income, and

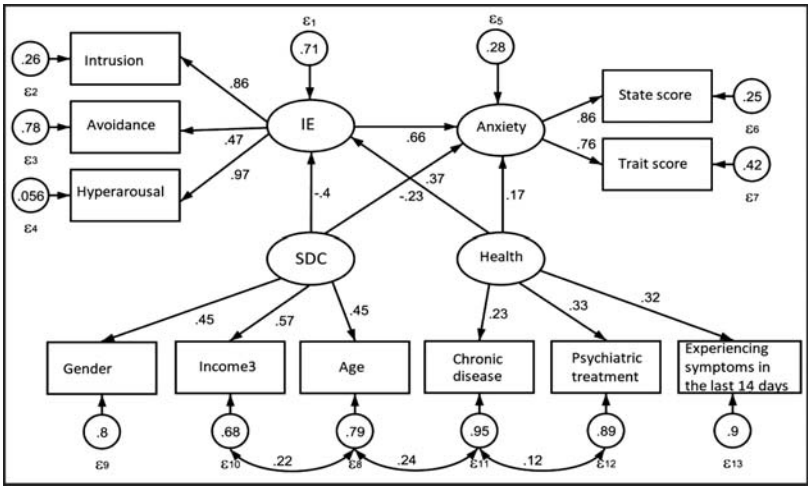

Figure: The relationship of the effect of the impact of event on the state-trait anxiety level with socio-demographic characteristics and health state, structural equation modeling result.

Table-4: Factors affecting state-trait anxiety level and ordinal logistic regression analysis.

Variables	State Anxiety Crude OR (95% CI)	Trait Anxiety Adj. OR (95% CI)2	Crude OR (95% CI)	Adj. OR (95% CI)2
Age (18-29 years)	Ref	ref	ref	ref
30-39 years	0.64 (0.51-0.8)***	0.85 (0.62-1.15)	0.52 (0.42-0.65)***	0.86 (0.64-1.17)
40-49 years	0.49 (0.38-0.62)***	0.68 (0.5-0.94)*	0.45 (0.35-0.57)***	0.79 (0.57-1.09)
50-59 years	0.42 (0.3-0.57)***	0.52 (0.35-0.76)**	0.37 (0.28-0.51)***	0.62 (0.42-0.9)*
60 years and above	0.34 (0.21-0.55)***	0.5 (0.29-0.85)*	0.28 (0.17-0.46)***	0.53 (0.31-0.9)*
Gender (Female)	1.88 (1.57-2.25)***	1.27 (1.05-1.53)*	2.3 (1.92-2.76)***	1.61 (1.32-1.96)***
Education (before high school)	ref	ni	ref	ni
High School	1.04 (0.63-1.71)	ni	1.03 (0.61-1.74)	ni
University	1.25 (0.81-1.93)	ni	0.98 (0.62-1.57)	ni
Income (below 269 USD.)	ref	ref	ref	ref
269-672 USD	0.74 (0.6-0.92)**	1.09 (0.85-1.39)	0.64 (0.52-0.8)***	0.93 (0.73-1.19)
Above 672 USD	0.4 (0.32-0.51)***	0.96 (0.72-1.29)	0.26 (0.2-0.33)***	0.54 (0.40-0.73)***
Residence (village/district)	ref	ref	ref	ref
City	0.56 (0.41-0.77)***	0.58 (0.42-0.81)**	0.51 (0.38-0.7)***	0.66 (0.48-0.91)*
Metropolitan	0.78 (0.62-0.98)*	0.73 (0.57-0.93)*	0.61 (0.48-0.77)***	0.66 (0.52-0.84)**
Marital status (married)	0.63 (0.53-0.76)***	1.08 (0.84-1.39)	0.54 (0.45-0.64)***	0.96 (0.74-1.23)
Chronic disease (yes)	1.32 (1.04-1.67)*	1.27 (0.99-1.62)	1.28 (1.01-1.62)*	1.28 (1.00-1.65)*
Psychiatric treatment (yes)	1.76 (1.35-2.29)***	1.08 (0.82-1.42)	2.36 (1.79-3.11)***	1.75 (1.31-2.33)***
COVID-19 symptom in the last 14 days (yes)	3.28 (2.02-5.35)***	1.89 (1.15-3.11)*	2.74 (1.67-4.50)***	2.24 (1.35-3.73)**
Consulting hospital in the last 14 days (yes)	2.23 (1.58-3.15)***	1.05 (0.74-1.48)	1.74 (1.24-2.45)**	0.77 (0.54-1.1)
Tested for COVID-19 (yes)	1.62 (0.99-2.63)	ni	1.30 (0.82-2.07)	ni
Quarantined in the last 14 days (yes)	2.47 (1.79-3.42)***	1.31 (0.94-1.83)	2.25 (1.64-3.11)***	1.06 (0.75-1.49)
Suspicious contact (yes)	1.36 (0.91-2.04)	ni	1.04 (0.69-1.56)	ni
Mask use frequency (never or sometimes)	ref	ni	ref	ni
Usually	1.04 (0.72-1.49)	ni	1.11 (0.78-1.58)	ni
Always	1.07 (0.77-1.48)	ni	1.07 (0.78-1.46)	ni
Staying at home (0-9 hours)	ref	ni	ref	ref
10-19 hours	0.86 (0.61-1.23)	ni	1.05 (0.74-1.5)	0.89 (0.63-1.26)
20-24 hours	1.16 (0.83-1.63)	ni	1.43 (1.02-2.01)*	0.76 (0.53-1.07)
Intrusion	1.25 (1.23-1.27)***	ni	1.19 (1.17-1.21)***	ni
Avoidance	1.10 (1.08-1.12)***	ni	1.08 (1.07-1.1)***	ni
Hyperarousal	1.40 (1.37-1.43)***	ni	1.30 (1,.27-1.33)***	ni
Impact of Event Total	1.10 (1.09-1.11)***	1.10 (1.09-1.11)***	1.08 (1.07-1.09)***	1.07 (1.07-1.08)***

* p<0.05. ** p<0.01. *** p<0.001. ni: not included in the model. OR: Odds ratio, CI: Confidence interval, USD: United States dollars, COVID-19: Coronavirus disease-2019.

Table-3: Mean scores of the scale and subscales.

Scales subscales	Mean±SD	Median (min-max)
Impact of Event Scale (IES)		
Intrusion	8.62±6.27	7 (0-32)
Avoidance	12.43±5.86	13 (0-32)
Hyperarousal	6.35±5.05	6 (0-24)
IES Total Score	27.40±14.54	26 (0-87)
State Anxiety Score	39.31±11.31	39 (20-80)
Trait Anxiety Score	42.75±8.70	42 (20-79)

SD: Standard deviation.

being female had a negative effect on anxiety (Figure).

Discussion

The mean state anxiety score of the subjects was 39.3±11.3, and that of the trait anxiety was 42.8±8.7. Kuru et al.[21] reported high anxiety levels in 30.70% of their participants. In a study conducted on 1210 participants in China during the COVID-19 pandemic,[22] it was found that 28.8% participants had moderate or severe anxiety symptoms. In a study[23] in Hong Kong, almost all participants stated that they were worried about COVID-19 and it disturbed their daily routines. The average score level determined in the practices was in the range of 36 and 41.[19] The current results are similar, and are accepted as normal. Based on the results, it can be argued that people do not give adequate importance to personal protective precautions during the COVID-19 period.

In a study in China, the psychological effect average score of COVID-19 pandemic was reported as 32.98. In the current study, IES-R mean score was in the range of 24-33, which is reported as the scale cut-off point for

Turkish society.[17]

The current study found that increasing age had a negative effect on anxiety. Some studies have shown no correlation between age and anxiety[24] while others have rported a positive correlation between the two.[22]

In the current study, the female gender showed an increasing effect on both state and trait anxiety. Studies have reported similar findings,[25,26] but there are also studies reporting higher anxiety levels among the males.[21] Sakaoglu et al. reported that females were more defenseless against stress and had a higher possibility of developing post-traumatic stress disorder (PTSD).[27] A Chinese study[22] determined that females were affected from the psychological outcomes of the pandemic more negatively than the males.

The current study showed that an increase in the income level had a decreasing effect on both state and trait anxiety. A study[28] found that high income level decreased trait anxiety.

Compared to those living in a village or district, the state anxiety levels of those living in a city were lower in the current study and the same was true of the trait anxiety level. In contrast, one study[29] found that those living in the cities were the most anxious and those living in villages were the least anxious.

Having a chronic disease caused significant level of anxiety in the current study. Kuru et al,[21] found anxiety level scores of those having chronic diseases high.

The large sample size of the current study was its strength, while it also has its limitations as it comprised only those having internet facilities and were computer-literate, while all others were excluded. Another limitation of the study is that it presents information only about a certain period of the pandemic since it is a cross-sectional study.

Conclusion

The COVID-19 pandemic was not found to cause a spike in the state-trait anxiety, and did not generate psychological pressure in society. However, it was found that the increase in IES-R score had an increasing effect on anxiety level.

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