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Prevalence and predictors of psychological response during immediate COVID-19 pandemic

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Abstract

Aim: COVID-19 pandemic has created a serious psychological impact worldwide since it has been declared. This study aims to investigate the level of psychological impacts of the COVID-19 pandemic on the Turkish population and to determine related factors.

Methods: The study was carried out by an online questionnaire using the virtual snowball sampling method. The sociodemographic data were collected on the following subjects: participants' experience on any signs of infection within the last month, the history of COVID-19 contact-treatment-quarantine, level of compliance with precautionary measures, the sources of information and level of knowledge about the pandemic process and their belief levels on the knowledge they acquire. Besides, the questions that take place in the Depression, Anxiety and Stress Scale-21 (DASS-21), and Impact of Events Scale-Revised (IES-R) were asked to participants.

Results: Of the 3549 participants, anxiety was found in 15.8%, depression in 22.6%, stress in 12.9%, and psychological trauma in 20.29% based on moderate and above levels. Female gender, young age, higher education level, being single, high monthly income, presence of psychiatric illness, a large number of people living together, having any signs of infection, and contact history with COVID-19 infected person or contaminated object are identified as risk factors that may increase psychological impact. Compliance with the rules was found to reduce the risk of psychological response.

Conclusions: The risk factors for the psychological impact of the COVID-19 pandemic, and acknowledging these factors can help to formulate the interventions to reduce the stress levels of the population.

1 | INTRODUCTION

COVID-19 has emerged as a pneumonia form of unknown aetiology in a group of patients with a connection to the Huanan South China Seafood Market in Wuhan, China, in late 2019, and soon spread across the world.[1] Being much more widespread than Severe Acute Respiratory Disorder Syndrome (SARS) in 2002, and Middle East Respiratory Syndrome (MERS) in 2012,[2] COVID 19, which is considered as the most common viral epidemic of our time, has spread to

more than 200 countries worldwide and has affected thousands of people since its inception. The number of reported cases increases every day and by this time (09.12.2020) throughout the world the number of confirmed cases has reached the number of 67.530.912 and 1.545.140 people died.[3]

The outbreak not only increased the risk of death from a viral infection but also caused people to experience unbearable psychological pressures.[4] Before the declaration of any confirmed cases in Turkey, images, and videos which were spread via social media and TV news have created a panic in Turkey as well as all over the world. These images and videos displayed examples of abrupt falling and deaths of people in the middle of the street, patients' agony in quarantine, and experiences of confluence during strife with the prohibitions and restrictions, and the suffering of people who could not see the funerals of their relatives.

Following the announcement of the first coronavirus case on March 11th, 2020, urgent measures were taken in order to prevent an outbreak by the authorities in Turkey. Entries and exits to the country have been forbidden and quarantine obligation has been introduced for the citizens who come from abroad. Schools, including universities, were closed, flexible working opportunities were provided in many public institutions, and a social distance rule was established to minimise contamination. People over the age of 65 and under 20 have been imposed a curfew and in many provinces, the public has been made to comply with this regulation on weekends. Also, public meetings were postponed, intercity travel was stopped, and new rules have been introduced for public transportation, markets, shopping malls, etc. The minister of health shared the current information about the coronavirus cases with the community every day and gave information about the precautionary measures. However, despite all these precautions, thousands of people were infected and many of our citizens died.

Many factors such as the persistence of the pandemic in the world, the lack of current treatment, and the uncertainty of the duration of the measures taken brought forward the risk of being affected psychologically. As a matter of fact, recent studies have shown that struggling with this uncertainty as well as the physical effect of the disease, economic-educational losses, etc, because of social isolation, may decrease the communication amongst people and increase the rates of depression and anxiety over time.[4-7] Naturally, in an extraordinary situation such as pandemic, acute psychological exposure may be a foregone conclusion, but continuing the process may cause permanent psychological and biological effects. Therefore, while evaluating the pandemic, the detection of psychological problems, and related factors that may develop; it is important to determine the target audience, to take the necessary precautions, and to direct the aid. In the light of this information, in this study, it is aimed to determine the level of psychological impact and the factors that may be related to the COVID-19 outbreak in Turkish society where precautionary measures were implemented in the 6th week of the pandemic in the country.

What is known?

1. The COVID-19 pandemic caused various problems related to viral infection, including the risk of death.
2. In addition, it caused different levels of psychological effects in individuals.

What is new?

1. Risk factors causing psychological response such as sociodemographic variables, data on the areas of concern, the level of compliance with precautionary measures, the participants' information source, the presence of physical symptoms, were determined in detail within the same study.
2. Female gender, young age, higher education level, being single, high monthly income, presence of psychiatric illness, large number of people living together, having any signs of infection, and contact history with a COVID-19 infected person are identified as risk factors that may increase psychological impact.
3. Compliance with the rules was found to reduce the risk of psychological response.

2 | METHODS

2.1 | Participants and study protocol

This study is a cross-sectional study and has been approved by the ethics committee (2020/652). This study was conducted 6 weeks after the first COVID-19 case was officially announced. The individuals who were planned to participate in the study were determined by a virtual snowball sampling method and invited to participate in the web survey online. Data acquisition was stopped when the targeted sample size of 3549 people was reached within 5 consecutive days. A questionnaire consisting of seven sub-units was sent to the participants. Section 1 of the questionnaire included sociodemographic features, Section 2 included questions on the presence of symptoms for any infectious disease, contact with COVID-19, treatment, quarantine history, Section 3 included questions on compliance with the measures taken (these questions were inspired by the 14 rules determined by the official authorities in our country), Section 4 included questions on the source from which information about COVID-19 was acquired; level of knowledge, belief in the information received, health services and measures sufficiency level, level of belief in life chances. Section 5 included questions on anxiety associated with possible health and sociological losses of the pandemic. The 6th section consisted of DASS-21 related questions and Section 7 consists of questions related to IES-R. DASS and IESR were used in previous pandemic studies.[8,9] Data for individuals 18 and older who agree to participate voluntarily were included in the current study. Data of

individuals with a history of bipolar disorder and/or psychotic disorder were not evaluated and excluded during the analysis phase.

2.2 | Data collection tools

2.2.1 | Depression anxiety and stress scale-21 (DASS-21)

In the study, DASS-21 was used to evaluate the current mental impact. DASS-21 is a short-form version of the original 42-item questionnaire designed as self-report.[10] Its validity and reliability in Turkish were performed by Sarıçam in 2018.[11] The scale consists of depression, anxiety, and stress subfields. In the depression subscale, 0-4 points are normal, 5-6 points are mild, 7-10 points are moderate, 11-13 points are severe, and ≥14 points are extremely severe. In the anxiety subscale, 0-3 points are normal; 4-5 points are mild, 6-7 points are moderate, 8-9 points are severe, ≥10 points are extremely severe anxiety; in the stress subscale, 0-7 points are normal, 7-8 points are mild, 10-12 points are moderate, 13-16 points are severe, and ≥17 express extremely severe stress.

2.3 | Impact of event scale-revised (IES-R)

The scale which was originally named Impact of Event Scale-Revised (IES-R)[12] was used to measure the psychological trauma caused by the COVID-19 outbreak in the study. The Turkish validity and reliability of this scale, which is widely used in daily clinical practice and studies to evaluate the severity of post-traumatic stress, was made by Çorapçıoğlu et al in 2016.[13] There are 22 questions divided into three subgroups (intrusive, avoidance, hyperarousal) on the scale where the severity of symptoms in the last 7 days is scored between 0 and 4. For the total IESR score, 0-23 is normal, 24-32 mild, 33-36 moderate, and ≥37 indicate severe psychological impact.

2.4 | Statistical analysis

The quantitative data used in the study were summarised as arithmetic mean ± standard deviation and qualitative data as numbers (percent). As the four dependent variables in the study, DASS-21 anxiety, depression and stress subfields, and IES-R total scores were selected, and the related data were converted into binary categorical data according to the following criteria. A cut-off of the IES-R total score ≥33 was used to reflect moderate-to-severe impact.[14] Similarly, individuals with a score of 7 and above in the depression subscale, 6 and above in the anxiety subscale, 10 or above in the stress subscale cut-off points were used to determine the moderate and above psychological influence reflected on DASS-21.[8] Since the number of dependent variables is four, four different binary logistic regression models were applied to the data set. Before applying the related models, variable selection algorithms based on each dependent variable were applied to the data, and independent variables considered to have no contribution to modelling were removed from the data set. As a variable selection method, LASSO (Least absolute shrinkage and selection operator)[15] logistic regression technique was applied. The goodness of fit and coefficients of the created models were evaluated by Hosmer-Lemeshow ($P > .05$) and Omnibus ($P < .05$) tests, respectively. In logistic regression models, the significance level for model coefficients was determined as $P < .05$. In the analysis, "BKSY: Information Discovery Process Software" developed by Inonu University Faculty of Medicine Department of Biostatistics and Medical Informatics was used for the data analysis.[16]

3 | RESULTS

3.1 | The relationship between sociodemographic variables and psychological response

The data obtained from 3549 people were included in the research. The average age of the participants was 38.8 ± 10.9 years, 1389 (39.1%) were male and 2160 (60.9%) were female. The average age for women was 37.8 (±11.1) years and the average age for men was 40.3 ± 10.7 years. When DASS-21 scores of 3549 participants were evaluated; 200 (5.6%) individuals were extremely severe, 124 (3.5%) severe, 479 (13.5%) moderate, 416 (11.7%) mild, 2330 (65.7%) normal levels for depression subspace. For the anxiety subfield, 187 (5.3%) people were extremely severe, 127 (3.6%) people were severe, 246 (6.9%) were moderate, 385 (10.8%) were mild, and 2604 (73.4%) were normal. For the stress subfield 69 (1.9%) individuals were extremely severe, severe for 160 (4.5%) people, moderate for 220 (6.2%) people, mild for 279 (7.9%), and normal range for 2821 (79.5%). When IESR scores were evaluated; 552 (15.6%) people were in the severe range, 168 (4.7%) people were in the moderate range, 662 (18.7%) were mild and 2167 (61.1%) were in the normal range. The prevalence values moderate to extremely severe, while DASS-21 was 10.51% for anxiety, 16.99% for depression, and 10.71% for stress, the prevalence value for the for the moderate to extremely severe was 20.29% for IES-R.

Data related to the relationship between sociodemographic variables and DASS-21 and IES-R are given in Table 1. Increasing age was associated with high depression ($P = .021$, OR = 0.985) and stress ($P = .015$, OR = 0.981) scores, but had no effect on anxiety and IES-R scores ($P > .05$). Being a woman generated more risk for anxiety, depression, and stress and trauma response. According to the level of education, being a university graduate reduces the risk of anxiety by 2.22 times ($P = .026$, OR = 0.451) and the risk of depression approximately 2.02 ($P = .04$, OR = 0.495) times compared with primary school graduates. Being married reduced the risk of developing stress 1.739 times compared with being single ($P = .002$, OR = 0.575). The most risky group for the development of stress was those with an income level of 10,000 TL and above ($P = .003$, OR = 2.029). As the number of people living at home

TABLE 1 Relationship between sociodemographic variables and psychological response

Sociodemographic variables																
					DASS-21											
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
Age	-	-	-	-	.55	0.996	0.981-1.01	**.021**	0.985	0.972-0.998	**.015**	0.981	0.965-0.996	.091	0.99	0.978-1.002
Gender	Male	1389 (39.14%)	Female	2160 (60.86%)	**<.001**	1.84	1.389-2.45	**.001**	1.509	1.189-1.919	**<.001**	2.351	1.735-3.218	**<.001**	1.685	1.332-2.14
Education status	Primary	65 (1.83%)	Middle	81 (2.28%)	.503	0.722	0.277-1.874	.316	0.64	0.267-1.528	NS					
			High	453 (12.76%)	.125	0.564	0.276-1.197	.153	0.606	0.308-1.22						
			University	2950 (83.12%)	**.026**	0.451	0.228-0.932	**.04**	0.495	0.256-0.983						
Marital status	Single	877 (24.71%)	Widowed/Divorced	230 (6.48%)	.466	0.823	0.486-1.381	.854	0.957	0.599-1.52	.47	0.813	0.459-1.416	.493	0.852	0.537-1.341
			Married	2442 (68.81%)	.08	0.754	0.551-1.035	.109	0.788	0.589-1.056	**.002**	0.575	0.406-0.814	.299	0.866	0.661-1.137
Profession	Unemployed	48 (1.35%)	Health employee	852 (24.01%)	NS			.523	0.779	0.363-1.69	NS			NS		
			Officer-Sec. Forces.	641 (18.06%)				.102	0.523	0.242-1.146						
			Student	383 (10.79%)				.801	0.906	0.422-1.967						
			Others	1625 (45.79%)				.079	0.521	0.252-1.091						
Health insurance	No	182 (5.13%)	Yes	3367 (94.87%)	.182	0.736	0.473-1.164	NS			0.056	0.64	0.407-1.019	.156	0.751	0.508-1.122
Monthly income	≤ 2500 TRY	389 (10.96%)	2500-5000 TRY	998 (28.12%)	NS			NS			**.025**	1.562	1.062-2.317	NS		
			5000-10000 TRY	1309 (36.88%)							**.036**	1.56	1.034-2.375			
			≥10 000 TRY	853 (24.03%)							**.003**	2.029	1.283-3.233			
Number of people living in the house	1	231 (6.51%)	2	534 (15.05%)	NS			NS			.091	1.675	0.932-3.098	.588	0.886	0.573-1.38
			3	897 (25.27%)							**.008**	2.203	1.251-4.015	.629	0.902	0.594-1.381
			4	1169 (32.94%)							**.006**	2.279	1.294-4.159	.66	0.909	0.599-1.395
			5+	718 (20.23%)							**.003**	2.476	1.383-4.58	.086	0.677	0.434-1.062
Presence of people over the age of 65 in the house	No	3084 (86.90%)	Yes	465 (13.10%)	.247	0.807	0.559-1.155	NS			NS			NS		
Presence of known psychiatric disease	No	2939 (82.81%)	Yes	610 (17.19%)	**<.001**	2.426	1.886-3.117	**<.001**	2.297	1.833-2.876	**<.001**	2.224	1.713-2.88	**<.001**	2.034	1.622-2.547
Presence of chronic disease in the family	No	2266 (63.85%)	Parents	778 (21.92%)	.818	0.966	0.717-1.295	.395	1.106	0.876-1.395	.577	0.921	0.689-1.226	NS		
			Household	505 (14.23%)	.187	1.248	0.895-1.73	.052	1.327	0.995-1.761	.316	1.196	0.838-1.692			
Smoking	No	2324 (65.48%)	Yes	1225 (34.52%)	NS			NS			NS			.192	1.146	0.933 - 1.405

Abbreviations: CI, Confidence interval; NA, Not available; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

increased, the risk of developing stress increased. The fact that the number of people living at home was 5 and above posed a high risk for stress ($P = .003$, OR = 2.476). The presence of individuals over 65 years old at home did not cause any psychological response ($P = .247$, OR = 0.807). The presence of psychiatric illness in the individual was significantly associated with high DASS-21 and IES-R scores.

Having a history of psychiatric illness increased the risk of developing anxiety 2.5 times ($P < .001$, OR = 2.426), increased the risk of developing depression 2.3 times ($P < .001$; OR = 2.297), increased the risk of developing stress 2.2 times ($P < .001$, OR = 2.224). It was observed that it increased the risk of developing trauma approximately two times ($P < .001$, OR = 2.034). The presence of chronic illness in the family and smoking did not have any effect on the development of depression, anxiety, and trauma response ($P > .05$ for all areas).

3.2 | The relationship between participants' history of contact and treatment with COVID-19 within the last month and their psychological response levels

Data related to the participants' history of contact and treatment with COVID-19 within the last month and their psychological response levels are shown in Table 2. Five hundred thirty-eight (15.2%) of the participants had a history of meeting with someone diagnosed with COVID-19 and 159 (4.5%) had a history of contact with an individual with suspected COVID-19 or contaminated materials. The presence of a history of contact with a COVID-19 had a 2.3-times increase in the risk of anxiety ($P < .001$, OR = 2.297), and 1.43 times enhancing effect in the risk of depression ($P = .029$, OR = 1.428). Having a contact history with contact with an individual with suspected COVID-19 or infected materials, increased the risk for depression two times ($P < .004$, OR = 2.005), 1.84 times for stress ($P = .028$, OR = 1.838) and 1.77 times ($P = .013$, OR = 1.773) had an enhancing effect for IES-R. The test history for COVID-19 had a 1.62 times protective effect on trauma formation ($P = .035$, OR = 0.617). Although quarantine status had a protective effect on anxiety and stress, it had 2.35 times risk-reducing effects for anxiety and 2.99 times for stress ($P = .027$, OR = 0.424, $P = .016$, OR = 0.334, respectively). Treatment with COVID-19 did not affect the psychological impact.

3.3 | The relationship between the presence of physical symptoms within the last month and psychological response levels

The relationships between the presence of physical symptoms and psychological responses in the last 1 month are given in Table 3. When the participants were questioned whether they had experienced any / several of the symptoms of fever, cough, sore throat, shortness of breath, chest pain, headache, runny nose, muscle pain, diarrhoea, nausea in the past 1 month. In the analysis, different symptoms caused different levels of psychological response. The presence of fever in the last 1 month had an enhancing effect on the development of anxiety ($P < .001$, OR = 2.193) and stress ($P = .013$, OR = 1.572). Sore throat was associated with high anxiety and IES-R ($P = .049$, OR 1.282, $P = .016$, OR = 1.431, respectively). Chest pain had an effect on increasing the risk for anxiety ($P < .001$, OR = 2.269) and trauma ($P = .049$, OR = 1.34). Shortness of breath had an increasing effect on the risk of experiencing anxiety ($P < .001$, OR = 2.286) and depression ($P = .016$, OR = 1.431). Headache, rhinorrhea, diarrhoea, cough did not pose a risk in psychological response. Nausea increased the risk of developing anxiety and stress by 1.37 and 1.489 times, respectively, compared with those who did not have nausea ($P = .028$, OR = 1.37; $P = .007$, OR = 1.489).

3.4 | The relationship between participants' source of information, level of belief in knowledge and their level of psychological response on COVID-19 pandemic

The relationships between the sources of information, its level, belief in knowledge, and psychological response are given in Table 4. One thousand seven hundred ninety-seven (50.6%) participants stated that they received information about COVID-19 most frequently from TV/radio. When the participants are evaluated in terms of knowledge level, source, and belief level from which the information is obtained; these variables had no effect on psychological response ($P > .05$ for all areas). The presence of chronic illness in the family and smoking did not have any effect on the development of depression, anxiety, and trauma ($P > .05$ for all areas). Finding the measures adequate reduced the risk of depression by 1.386 times ($P = .041$, OR = 0.721). In addition, compared with those who did not have the idea of finding a high chance of survival, it had a reducing effect on depression 1.68 times ($P = .003$, OR = 0.594).

3.5 | The relationship between the level of compliance with precautionary measures and psychological response levels

The relationships between the compliance level of the participants and the psychological response are given in Table 5. The number of people who comply with precautionary measures; 3357 (94.6%) for hand washing with soap, 3447 (97.1%) for closing the mouth and nose during coughing or sneezing, 3190 (89.9%) for cancelling international travel plans, paying attention to social distance, 3059 (86.2%) for wearing a mask while going out with or without symptoms, 3362 (94.7%) for the ventilation of the environment frequently, 2449 (69%) for cleaning the frequently used surfaces with water and detergent, 1976 (55.7%) for separating personal belongings, 2401 (67.7%) for washing clothes at high temperature 2275 (64.1%) for at

TABLE 2 The relationship between participants' history of contact with COVID-19 and treatment and psychological response levels

Contact / treatment history																
					DASS-21											
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
Contact with someone diagnosed with COVID-19 in the last 1 mo	No	2463 (69.40%)	I do not know	548 (15.44%)	.163	1.238	0.914-1.667	.885	0.978	0.726 - 1.314	.101	1.352	0.941 - 1.934	NS		
			Yes	538 (15.16%)	**<.001**	1.781	1.292-2.447	**.029**	1.428	1.035 - 1.965	.056	1.43	0.987-2.055			
Contact with an individual with suspected COVID-19 or contaminated materials	No	2301 (64.84%)	I do not know	1089 (30.68%)	NS			.051	1.266	0.998-1.605	.954	0.991	0.733-1.336	.196	1.15	0.93-1.421
			Yes	159 (4.48%)				**.004**	2.005	1.248-3.215	**.028**	1.838	1.061-3.158	**.013**	1.773	1.121-2.782
Testing status for COVID-19 in the last 1 mo	No	3343 (94.20%)	Yes	206 (5.80%)	NS			NS			NS			**.035**	0.617	0.39-0.957
Quarantine status for COVID-19 in the last 1 mo	No	3469 (97.75%)	Yes	80 (2.25%)	**.027**	0.424	0.191-0.875	.305	0.68	0.315-1.388	**.016**	0.334	0.127-0.773	NS		
Treatment status for COVID-19 in the last 1 mo	No	3519 (99.15%)	Yes	30 (0.85%)	NS			.254	0.459	0.108-1.628	NS			NS		

Abbreviations: CI, Confidence interval; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

TABLE 3 The relationship between the presence of physical symptoms in participants within the last month and psychological response levels

Symptom presence																	
					DASS-21												
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
Fever in the last 1 mo	No	3248 (91.52%)	Yes	301 (8.48%)	**<.001**	2.193	1.575-3.045	.127	1.283	0.93-1.765	**.013**	1.572	1.096-2.237	.098	1.308	0.949-1.793
Cough in the last 1 mo	No	2669 (75.20%)	Yes	880 (24.80%)	NS			.14	1.186	0.945-1.485	NS			NS		
Sore throat in the last 1 mo	No	2301 (64.84%)	Yes	1248 (35.16%)	**.049**	1.282	1-1.641	.304	1.12	0.902-1.389	.284	1.154	0.888-1.497	**.003**	1.375	1.112-1.7
Shortness of breath in the last 1 mo	No	3159 (89.01%)	Yes	390 (10.99%)	**<.001**	2.286	1.692-3.081	**.016**	1.431	1.068-1.913	.05	1.399	0.996-1.95	.42	1.129	0.839-1.513
Chest pain in the last 1 mo	No	3145 (88.62%)	Yes	404 (11.38%)	**<.001**	2.269	1.675-3.067	.067	1.31	0.98-1.748	.141	1.289	0.916-1.804	**.049**	1.34	1-1.791
Headache in the last 1 mo	No	1596 (44.97%)	Yes	1953 (55.03%)	.176	1.2	0.922-1.563	.222	1.145	0.921-1.424	NS			.108	1.198	0.961-1.496
Rhinorrhoea in the last 1 mo	No	2492 (70.22%)	Yes	1057 (29.78%)	.097	1.228	0.962-1.564	NS	NS	NS	.358	1.127	0.872-1.452	NS		
Muscle pain in the last 1 mo	No	2249 (63.37%)	Yes	1300 (36.63%)	**.004**	1.432	1.122-1.827	**.028**	1.264	1.026-1.556	.434	1.107	0.858-1.425	.058	1.228	0.993-1.517
Diarrhoea in the last 1 mo	No	2947 (83.04%)	Yes	602 (16.96%)	.13	1.24	0.937-1.634	NS			.376	1.142	0.849-1.53	NS	NS	NS
Nausea in the last 1 mo	No	2991 (84.28%)	Yes	558 (15.72%)	**.028**	1.37	1.033-1.809	.425	1.106	0.862-1.413	**.007**	1.489	1.111-1.988	.177	1.188	0.924-1.524

Abbreviations: CI, Confidence interval; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

TABLE 4 The relationship between the participants' information source, level of knowledge and level of belief in the knowledge about COVID- 19 and psychological response levels

Participants' information source, level of knowledge, level of belief in knowledge																
					DASS-21											
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
Source of information on COVID-19	TV-Radio	1797 (50.63%)	Social media	1195 (33.67%)	.488	1.093	0.85-1.403	.973	1.004	0.809-1.245	NS			NS		
			Friends-Milieu	81 (2.28%)	.77	1.112	0.53-2.205	.554	1.195	0.655-2.131						
			Doctor	280 (7.89%)	.19	0.737	0.462-1.154	.064	0.684	0.456-1.016						
			Other	196 (5.52%)	.698	0.903	0.53-1.496	.416	0.831	0.528-1.287						
Level of belief in the information you get about COVID-19	No	85 (2.40%)	Partially	1920 (54.10%)	NS			.432	1.282	0.699-2.419	NS			.348	1.347	0.734-2.562
			Yes	1544 (43.51%)				.77	1.099	0.591-2.1				.886	1.048	0.563-2.017
Following the daily number of COVID-19 patients	No	131 (3.69%)	Partially	599 (16.88%)	.562	0.829	0.446-1.591	NS			NS			NS		
			Yes	2819 (79.43%)	.44	1.258	0.716-2.303									
The presence of adequate measures relating to COVID-19	No	867 (24.43%)	Partially	1861 (52.44%)	NS	NS	NS	.206	0.864	0.69-1.084	.165	0.831	0.64-1.081	.083	0.819	0.654-1.027
			Yes	821 (23.13%)	NS	NS	NS	**.041**	0.721	0.526-0.986	.084	0.712	0.481-1.043	.236	0.827	0.604-1.131
Adequate level of knowledge about COVID-19's transmission patterns	No	28 (0.79%)	Partially	454 (12.79%)	.175	0.51	0.192-1.356	NS			NS			NS		
			Yes	3067 (86.42%)	.063	0.407	0.157-1.056									
The level of knowledge about the clinical symptoms of COVID-19 is sufficient	No	80 (2.25%)	Partially	740 (20.85%)	NS			.543	0.822	0.439-1.561	NS			NS		
			Yes	2729 (76.89%)				.559	0.827	0.441-1.579						
The level of knowledge about COVID-19's effect on age groups is sufficient	No	54 (1.52%)	Partially	603 (16.99%)	NS			.415	0.715	0.322-1.621	NS			NS		
			Yes	2892 (81.49%)				.179	0.575	0.259-1.304						

(Continues)

TABLE 4 (Continued)

Participants' information source, level of knowledge, level of belief in knowledge																
					DASS-21											
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
When gets infected with COVID-19, chance for survival is high	No	258 (7.27%)	Partially	1601 (45.11%)	.155	0.768	0.535-1.108	**.002**	0.588	0.424-0.818	NS			NS		
			Yes	1690 (47.62%)	.157	0.753	0.51-1.118	**.003**	0.594	0.421-0.84						

Abbreviations: CI, Confidence interval; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

least 8 hours of sleep, 2052 (57.8%) for at least 2 L of fluid per day and balanced nutrition was and the curfew was 2980 (84%). While frequent ventilation in the environment had a reducing effect on the anxiety level of approximately 1,577 times ($P = .047$, OR = 0.634), separating personal items and doing regular sports decreased the risk of depression ($P < .001$, OR = 0.626) by 1.59 times. Sleeping at least 8 hours a day, at least 2 L of water consumption, and balanced nutrition had a risk-reducing effect in all areas ($P < .05$). Compliance with the curfew reduced the risk of trauma by 1.34 times ($P = .01$, OR = 0.745).

3.6 | The relationship between data on the areas of concern and psychological response levels

The relationships between the areas of concern and the level of psychological response are given in Table 6. Considering the distribution of concerns according to age groups, 63.46% (n = 331) of the people between the ages of 18-25 were experiencing academic anxiety mostly. While 60.4% (n = 539) of the people between the ages of 26-35 were worried about the other people, the object of the anxiety of the individuals of 36 years old and above was based on the health of their families and relatives. The group with the most common economic anxiety was those with monthly income between 2500 and 5000 TL (n = 463, 46.3%). Five hundred thirty-six (54.5%) of 983 people with chronic diseases were worried about taking the medications that they should use regularly.

The anxiety of one's health had an enhancing effect by 1.56 times ($P < .001$, OR = 1.565) for anxiety and 1.49 times for trauma ($P < .001$, OR = 1.49). Anxiety for the health of relatives increased the stress level by about 1.99 times ($P = .01$, OR = 1.992). Experiencing economic anxiety had 1.25 times increasing effect on trauma formation ($P = .042$, OR = 1.254). While experiencing academic anxiety only had 1.30 times increasing effect on the risk of depression ($P = .028$, OR = 1.305), the anxiety that the treatment of the disease could not be found and safety anxiety was a risk-increasing factor in all areas of psychological response ($P < .001$). Experiencing anxiety while taking medications that should be used regularly increased 1.75 times the risk of anxiety ($P = .02$, OR = 1.755) had an enhancing effect. Experiencing fear of going to health controls had an enhancing effect by 1.39 times ($P = .003$, OR = 1.39) for depression, 1.363 times ($P = .025$, OR = 1.363) for stress and 1.269 times ($P = .031$, OR = 1.269) for trauma.

4 | DISCUSSION

This study provides important data regarding the impact of the pandemic in Turkey. First of all, it was detected that the society was significantly affected by the pandemic. Amongst the participants in the study; based on moderate and above psychological effects, anxiety was found in 15.8%, depression in 22.6%, stress in 12.9% for

TABLE 5 The relationship between the level of compliance with precautionary measures and psychological response levels

Compliance with precautionary measures																	
					DASS-21												
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
Do you wash your hands often with soap?	No	192 (5.41)	Yes	3357 (94.59)	NS			NS			NS			0.171	1.381	0.881-2.225
Do you cover your mouth and nose while coughing and sneezing?	No	102 (2.87)	Yes	3447 (97.13)	.426	0.787	0.442-1.443	.136	0.683	0.416-1.134	NS			NS		
With or without symptoms, do you wear a mask when going out?	No	490 (13.81)	Yes	3059 (86.19)	NS	NS	NS	.215	0.826	0.612-1.121	NS			NS		
Do you frequently ventilate the environments you are in?	No	187 (5.27)	Yes	3362 (94.73)	**.047**	0.634	0.407-1.003	NS			NS			NS		
Do you clean your frequently used surfaces with water and detergent every day?	No	1100 (30.99)	Yes	2449 (69.01)	NS			.138	0.851	0.687-1.054	.344	1.136	0.874-1.483	NS		
Have you separated your personal belongings?	No	1573 (44.32)	Yes	1976 (55.68)	NS			**.008**	0.76	0.621-0.93	NS			NS		
Do you wash your clothes at high temperatures (60°C and above)?	No	1148 (32.35)	Yes	2401 (67.65)	.252	1.151	0.906-1.466	NS			NS			.088	1.197	0.974-1.475
Do you sleep for at least 8 h	No	1274 (35.90)	Yes	2275 (64.10)	**.048**	0.79	0.626-0.999	**.005**	0.752	0.617-0.918	**<.001**	0.501	0.393-0.639	**<.001**	0.684	0.56-0.835
Do you pay attention to at least 2 litres of fluid consumption per day and balanced diet?	No	1497 (42.18)	Yes	2052 (57.82)	**.005**	0.718	0.568-0.906	**.001**	0.717	0.588-0.875	**<.001**	0.626	0.489-0.8	**.001**	0.725	0.595-0.882
Do you exercise regularly?	No	2969 (83.66)	Yes	580 (16.34)	.077	0.729	0.51-1.029	**<.001**	0.555	0.406-0.749	.354	0.842	0.58-1.204	NS		
Do you comply with the ban on leaving the house?	No	569 (16.03)	Yes	2980 (83.97)	.058	0.745	0.551-1.013	NS			.154	0.792	0.577-1.096	**.031**	0.745	0.572-0.976

Abbreviations: CI, Confidence interval; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

TABLE 6 The relationship between the data on areas of concern and psychological response levels

Areas of concern																
					DASS-21											
					Anxiety			Depression			Stress			IES-R Total		
Variables	Reference category	n (%)	Other category(ies)	n (%)	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI
I am worried about my own health	No	2105 (59.31)	Yes	1444 (40.69)	**<.001**	1.565	1.22-2.008	NS			.283	1.154	0.888-1.501	**<.001**	1.49	1.201-1.848
I am worried about the health of my family and relatives	No	623 (17.55)	Yes	2926 (82.45)	NS			.545	1.103	0.807-1.523	**.01**	1.992	1.207-3.461	.421	1.157	0.817-1.662
I am worried about economic status	No	2378 (67.00)	Yes	1171 (33.00)	.055	1.284	0.994-1.657	.068	1.235	0.984-1.547	.057	1.306	0.991-1.719	**.042**	1.254	1.007-1.559
I am worried about academic status	No	2676 (75.40)	Yes	873 (24.60)	.451	1.11	0.845-1.456	**.028**	1.305	1.029-1.653	.191	1.203	0.911-1.586	.259	1.145	0.904-1.446
I am worried about infecting others	No	1885 (53.11)	Yes	1664 (46.89)	.274	1.147	0.897-1.466	.544	1.067	0.866-1.314	.725	1.048	0.808-1.361	**.004**	1.356	1.1-1.674
I am worried about not getting adequate treatment when necessary	No	2388 (67.29)	Yes	1161 (32.71)	.09	1.251	0.965-1.619	.57	1.069	0.849-1.343	.481	1.105	0.837-1.457	.623	1.059	0.843-1.328
I am worried about lack of access to enough food	No	3151 (88.79)	Yes	398 (11.21)	NS			.896	1.02	0.759-1.367	NS			NS		
I am worried about that the treatment of the disease cannot be found and/or the outbreak will not end	No	2632 (74.16)	Yes	917 (25.84)	**<.001**	1.775	1.357-2.32	**<.001**	2.05	1.625-2.585	**<.001**	1.862	1.413-2.452	**<.001**	1.609	1.274-2.028
I am worried about safety	No	2878 (81.09)	Yes	671 (18.91)	**<.001**	1.794	1.354-2.375	**<.001**	1.928	1.495-2.486	**<.001**	1.939	1.455-2.583	**<.001**	2.074	1.621-2.652
I am worried while getting the medicines I should use regularly	No	3306 (93.15)	Yes	243 (6.85)	**.002**	1.755	1.237-2.485	.414	1.151	0.82-1.612	.096	1.365	0.943-1.964	.249	1.211	0.873-1.676
I am afraid to go to health checks	No	1920 (54.10)	Yes	1629 (45.90)	NS	NS	NS	**.003**	1.39	1.122-1.723	**.025**	1.363	1.04-1.791	**.031**	1.269	1.021-1.576

Abbreviations: CI, Confidence interval; NS, Not selected (by feature selection algorithm); OR, Odds ratio. Bold font indicates statistical significance: $P < .05$.

DASS-21, and trauma response in 20.29% for IES-R. In a study by the American Psychiatric Association, it was stated that the COVID-19 pandemic caused anxiety in 50% of the society and more than one-third felt that their mental health was seriously affected.[17] In the study conducted by Wang et al in the normal population in the second week of the pandemic, it was observed that 53.8% of the participants had a psychological response, 16.5% with depression, 28.8% with anxiety, and 8.1% with high stress.[8] Although the data obtained were close to the rates determined in China, they differed in terms of low IES-R rates. This result is probably related to the reduction of the acute effect of the pandemic in the community since the study was performed at the 6th week of the epidemic. Moreover, the fact that Turkey was not one of the first countries experiencing the outbreak, and had time to establish certain infrastructure related to the outbreak may be associated with lower trauma scores. However, since there is no previous study in our country, such a comparison is not possible to be made.

Epidemiological studies on epidemics or disasters have shown that sociodemographic variables are associated with different levels of psychological response. Epidemiological studies on epidemics or disasters have shown that sociodemographic variables are associated with different levels of psychological response. Women,[18-20] young people,[21] people with higher education,[22] health workers,[23] students,[24] those with low economic income,[25] people with or without a history of any disease[26] and smokers[27] are emphasised in the literature for having higher rates of psychological response. In our study, being a woman was found to be a risk factor in terms of being psychologically affected during this pandemic period as before.[28] This result may be related to the threat perceptions or anxieties about losing control amongst women.[29] The literature explains this issue through sex differences in the neuroendocrine response giving rise to the risk of psychologically affected.[19] Additionally, in accordance with the literature, young age, being single, an excessive number of people living together, presence of psychiatric disease history, and female gender were identified as higher risk conditions in terms of high psychological response. However, in contrast to the literature, high education levels significantly reduced the risk of anxiety and depression, while smoking, lack of health insurance, or low level of economic income were not associated with psychological exposure. This result may be because of the effects of cultural and/or religious differences amongst communities on human behaviour and perceptions.

While studies in the literature have shown that societies use the internet and social media as a general information source and the posts here play a role in psychological influence.[6,30] In our study, it was seen that most of the participants use television/radio as a source of information and this fact is not related to psychological influence. Although Turkish society has high levels of internet usage, the fact that the main source of information is expressed as TV/radio may be because of the low belief in the news on the internet. Moreover, the feeling of trust towards TV may be resulted from the fact of authorised institutions' regular and effective TV use during the pandemic. As a matter of fact, the high degree of satisfaction and belief in the information obtained supports this relationship.

Another conclusion drawn from our study is; although very few of the participants were diagnosed with COVID-19, in contrast to the literature,[31] interestingly, it has been found that being treated for COVID-19 infection is not related to psychological affect. Moreover, being quarantined and having a test reduced the level of psychological response.

Moreover, although there was no diagnosis of COVID-19, the presence of symptoms suggestive of any infection, and a history of contact with an individual or object infected with COVID-19 were also factors that increased the risk of psychological response in individuals. This result seems to be a reflection of the anxiety developed in accordance with the nature of "uncertainty." In the literature, "uncertainty" is accepted as causing a series of cognitive, emotional, and behavioural damage in the process of time. It is also considered as a "basic component of all anxiety disorders" which reduces problem-solving ability.[32] Accordingly, taking precautions such as regular sharing of information that will eliminate this uncertainty during the days of pandemic intensification, dissemination of diagnostic tests can contribute positively to the mental health of the society.

According to previous studies, despite social differences, there is a relationship between compliance with the measures taken and psychological impact.[23] In the study of Wang et al, compliance with precautionary measures has been shown to reduce the psychological response.[8] In our study which is consistent with the literature, it was found that the majority of the participants to be complying with the measures taken although Turkish society has been facing such a pandemic for the first time in its history. It has been also remarkable that people's adaptation to the rules to have a positive effect on psychological response. It is an expected result for a society in which people state that they pay more attention to the health of their relatives rather than their own and that they do not feel psychologically uncomfortable. In addition, it has been observed that regular exercise, a balanced diet, and attention to sleep patterns are protective factors in psychological response. However, it was found that most of the participants complied with these measures at a lower rate. Therefore, raising awareness of the society for these measures which are effective in psychological and biological empowerment seems to provide significant benefits in combating pandemics.

When the areas where the participants are concerned are evaluated, similar to previous pandemic studies,[33] the first three places, respectively, were the health of family and relatives, anxiety to infect others, and going to health controls. However, it was seen that the characteristics of the individuals during the pandemic caused anxiety about different issues. For example, academic anxiety was the primary concern amongst young people aged 18-25. The individuals with the most economic concerns were those with a monthly income of 2500-5000 TL and university graduates. A remarkable result here was that people's anxiety about taking medications that they had to take constantly increased their stress levels by 75.5%. Biologically at risk of further damage than COVID-19[34] this anxiety of the people is an important situation in terms of the disruption of the treatments and subsequent serious

health problems. Unfortunately, our study on why people bear this concern has not been able to provide a clear explanation. However, in our opinion, presenting information that has not been confirmed about whether or not some drugs can be taken in the media seems to cause more confusion and anxiety. Therefore, preventing information pollution about COVID-19 and making necessary explanations to these people at risk, will contribute to the reduction of anxiety levels, and it seems to contribute positively to the lives of these people with physical illness. For that purpose, the presentation of online or smartphone-based psychoeducation applications, which include cognitive behavioural therapy (CBT) and mindfulness-based cognitive therapy can be helpful to provide correct information to these people who have exaggerated fear. Especially in this period of intense transmission, these may correct their cognitive biases and help them to improve their ability to manage and cope with their anxiety by relaxation techniques.[35,36] Moreover, digital CBT, which covers a range of technologies such as the internet, smartphone applications, and other devices such as computers, can reduce this transmission from face-to-face communication and therapy. Since it provides easier access and has lower cost,[36,37] not only the workload of hospitals would be reduced but also economic contribution can be succeeded. Furthermore, these platforms can also provide a support network for those people who have to spend most of their time at home during the pandemic.[8]

4.1 | Limitations and conclusion

There were some limitations regarding this study. First, although this study has reached a relatively high sample size from different strata of the society, inviting participants to the study in an electronic environment has prevented those who do not have this opportunity and those who do not read or speak Turkish. Therefore, the results may not reflect the general population. Additionally, this study mainly used self-reported questionnaires to measure psychiatric symptoms and did not make a clinical diagnosis. The gold standard for establishing psychiatric diagnosis includes a structured clinical interview and functional neuroimaging.[38,39] In the future, the information obtained through face to face interviews and particularly functional neuroimaging rather than a questionnaire will correct the limitations. Second, because of the cross-sectional type of research, its place in the determination of psychological effects in the long term is limited. This indicates that follow-up studies are needed to determine the long-term effects of the pandemic.

Despite all these limitations, our study provides important data in terms of determining the changes in the mental health of society and related factors. These outcomes can guide in determining and directing the measures to be taken now and in the future.

DISCLOSURES

The authors have declared no conflicts of interest for this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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