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Examining the correlation between COVID-19-related anxiety level and health perception in adults

Yetişkin bireylerde COVID-19 nedeniyle oluşan kaygı düzeyi ile sağlık algısı arasındaki ilişkinin incelenmesi

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ABSTRACT

***Aim*:** The aim of this study is to examine the relationship between the level of anxiety caused by COVID-19 and health perception in adult individuals in Turkey.
Methods: The population of this descriptive study consisted of individuals between the ages of 18-60 living in Turkey, and the sample consisted of 931 people who agreed to participate in the study. The data of the research were collected using an online questionnaire. Personal Information Form, which includes the socio-demographic characteristics of the participants and the effects of the COVID-19 pandemic, and the State-Trait Anxiety Inventory (STAI-TX) and Health Perception Scale (PHS) were used to obtain the data. Number, mean, standard deviation, percentage, t-test, one-way analysis of variance (ANOVA), pearson correlation analysis and multiple regression analysis were used in the analysis of the data.
Results*:* It was determined that the mean STAI score of the participants was 45.4±11.8 and the mean PHS score was 46.7±8.0, and there was a negative correlation between health perception and anxiety level. Gender, education level, income status, presence of chronic disease were determined as risk factors for anxiety level, gender, income status and presence of chronic disease were determined as risk factors for health anxiety.
Conclusion: In this study, it was determined that as the health perceptions of adult individuals increased during the COVID-19 pandemic, their anxiety levels decreased.

Keywords*:* anxiety level; COVID-19; health perception

ÖZET

Amaç: Bu çalışmada amaç, Türkiye'deki yetişkin bireylerde COVID-19 nedeniyle oluşan kaygı düzeyi ile sağlık algısı arasındaki ilişkiyi incelemektir.
Yöntem: Tanımlayıcı tipteki bu araştırmanın evrenini Türkiye'de yaşayan 18-60 yaş aralığındaki bireyler, örneklemini ise araştırmaya katılmayı kabul eden 931 kişi oluşturmuştur. Araştırmanın verileri çevrimiçi bir anket kullanılarak toplanmıştır. Verilerin elde edilmesinde katılımcıların sosyo-demografik özelliklerini ve COVID-19 pandemisinin etkilerini içeren Kişisel Bilgi Formu ile Durumluk-Sürekli Kaygı Envanteri (STAI-TX) ve Sağlık Algısı Ölçeği (PHS) kullanılmıştır. Verilerin analizinde sayı, ortalama, standart sapma, yüzde, t-testi, tek yönlü varyans analizi (ANOVA), pearson korelasyon analizi ve çoklu regresyon analizi kullanılmıştır.
Bulgular: Katılımcıların ortalama STAI puan ortalamasının 45.4±11.8 ve PHS puan ortalamasının 46.7±8.0 olduğu, sağlık algısı ile kaygı düzeyi arasında negatif yönde bir ilişki olduğu belirlendi. Kaygı düzeyi için risk faktörleri olarak cinsiyet, eğitim düzeyi, gelir durumu, kronik hastalık varlığı, sağlık kaygısı için risk faktörleri olarak cinsiyet, gelir durumu ve kronik hastalık varlığı belirlendi.
Sonuçlar: Bu çalışmada, yetişkin bireylerin COVID-19 pandemisi sırasında sağlık algıları arttıkça kaygı düzeylerinin azaldığı belirlenmiştir.

Anahtar kelimeler*:* kaygı düzeyi; COVID-19; sağlık kaygısı

Introduction

The novel coronavirus, named COVID-19, is a highly contagious viral disease produced by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) with devastating impact on global populations (Zinatizadeh et al., 2022). It first appeared in the Chinese city of Wuhan in late December 2019 and was reported as cases of pneumonia of unknown etiology. It was later identified by the World Health Organization (WHO) as an epidemic that raised serious public health concerns. By mid-March 2020, WHO declared a global epidemic due to the significant spread of the disease globally (Al Dhaheri et al., 2021). COVID-19 has caused great destruction in the World and many people have died due to this disease (Sharma, 2021).

Up to April 18, 2021 coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome has taken 3.004.842 lives and infected 140.373.125 people according to the data from World Health Organization (WHO) (Wang, Chen, Gao & Wei, 2021). According to the information given by the Ministry of Health in Turkey; By February 28, 2022, the total number of COVID 19 cases is 14.027.181, the total number of deaths is 94.232 (Ministry of Health, 2022). COVID-19 is a global threat which threatens human life, affects all communities and remains a mystery in terms of preventive and therapeutic methods (Doğan & Düzel, 2020). It is seen that the pandemic has affected not only the healthcare field, but also the economic and psychological fields in social life (Yıldırım, 2020). Great losses of lives experienced due to the pandemic, caused by the COVID-19 virus, in a short time across the world and lack of enough knowledge of health authorities and scientists concerning the disease strengthen the sense of uncertainty about the disease in people (Doğan & Düzel, 2020). Lack of information about the time and course of the pandemic, the quarantine practices, the regulations made in the working models, the negative effects of the pandemic on many people at the same time cause anxiety (Çiçek & Almalı,

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2020; Doğan & Düzel, 2020; Yılmaz & Sağlam, 2021). Lack of sufficient knowledge concerning the time and course of the pandemic and negative impacts of the pandemic on many people at the same time result in anxiety (Çiçek & Almalı, 2020; Doğan & Düzel, 2020). Factors such as the increase of mortality rates, excessive numbers of intensive care patients and intubated patients, social isolation, job losses and failure of fulfilling religious rituals, have increased the anxiety rate since the beginning of the pandemic (Çölgeçen Y. & Çölgeçen H., 2020; Lai et al., 2020). Additionally, as constantly giving information and explanations about COVID-19 on the media and other communication instruments potentially creates a mass hysteria and fear, it also increases anxiety (Doğan & Düzel, 2020; Lai et al., 2020). Experiencing constant stress, panic and anxiety in the general population during the pandemic period has negative effects on the psychological well-being of individuals (Al Dhaheri et al., 2021; Doğan & Düzel, 2020).

Proper health behaviours to be displayed by people in case of a pandemic are important to reduce possible losses of lives because they minimize the spread rate and geographical prevalence of the pandemic. It is important to have knowledge about these behaviours in order for authorities to be prepared to pandemics and intervene in them effectively (Altay, Çavuşoğlu & Çal, 2016). People's perceptions, beliefs and attitudes affect their health behaviours (Lee et al., 2016). Mode of perceiving health is based on individuals' evaluation of their own state of health and is a strong indicator which reflects the multidimensionality of health and enables the person to evaluate his/her own mental, biological and social condition Health perception may vary according to personal characteristics like age, education, gender, socio-economic condition, environmental and cultural factors, as well as cognitive factors like motivation and need (Ekiz, Ilıman & Dönmez, 2020).

Communities will be healthy only through people who have acquired health perception and display health behaviours (Lee et al., 2016). Knowing the anxiety that may rise throughout the pandemic is important for the spread of the pandemic, its control and early identification of mental health issues that may rise during and after the pandemic period (Göksu & Kumcağız, 2020). Therefore, the aim of this study is to examine the relationship between the level of anxiety and health perception caused by COVID-19 in adults.

Methods

The population of this descriptive study consists of approximately 51.900.450 individuals between the ages of 18-60 living in Turkey (TUIK, 2020). The sample, on the other hand, consists of 385 individuals with 5% significance and 95% confidence interval according to the sample calculation. The research was carried out with 931 people who accepted to participate in the and met the inclusion criteria. The data of the research; it was collected using snowball sampling method,

Table 1. Comparison of the STAI and PHS mean scores according socio-demographic and some characteristics (n=931)

			STAI		PHS	
	n	%	X±SD	Significance	X±SD	Significance
Gender						
Female	592	63.6	46.4±11.3	t=3.645	45.2±7,2	t=-4.733
Male	339	36.4	43.5±12.5	**p=0.000**	48.3±9.0	**p=0.000**
Marital status						
Married	282	30.3	44.8±12.1	t=0.912	46.7±8,3	t=-0.43
Single	649	69.7	45.6±11.7	p=0.362	46.7±7,9	p=0.966
Education						
Primary school	46	4,9	40.0±13.5	F=3500	49.2±10.7	F=4.214
Secondary school	60	6.4	45.6±13.5	**p=0.008**	44.3±8.2	**p=0.002**
High school	262	28.2	45.4±11.4		45.7±7.6	
University	525	56.4	45.5±11.7		47.1±7.7	
Postgraduate/doctorate	38	4.1	49.3±8.7		48.6±8.7	
Working in a healthcare						
Yes	68	7.3	47.3±11.6	t=1.427	48.7±7,9	t=2.117
No	863	92.7	45.2±11.8	p=0.154	46.5±8,0	**p=0.035**
Health worker in the family						
Yes	149	16.0	45.2±12.6	t=-0.224	48.0±8.4	t=2.243
No	782	84.0	45.4±11.7	p=0.823	46.4±7.9	**p=0.025**
Income status						
Income less than expenditure	202	21.7	49.0±13.1	F=12.933	46.0±8.2	F=3.042
Income equal to expenditure	532	57.1	44.7±11.0	**p=0.000**	46.5±7.8	**p=0.48**
Income more than expenditure	197	21.2	43.6±11.8		47.9±8.3	
Family type						
Nuclear family	764	82.1	45.2±11.9	t=-717	46.9±8.0	t=1.665
Extended family	167	17.9	46.0±11.2	p=0.473	45.7±7.9	p=0.96
Chronic illness						
Yes	106	11.4	47.9±10,7	t=2.348	45.1±8,7	t=-2.195
No	825	88.6	45.0±11,9	**p=0.019**	46.9±7.9	**p=0.028**
			Min-Max		**X±SD**	
Age (Years)			18-60		26.8±9.8	

STAI: State Anxiety Inventory; PHS: Perception of Health Scale

which is one of the non-probability sampling methods. The data were collected online using the Google Form between June and July 2020. The people who agreed to participate in the study were asked to complete the survey via social media (WhatsApp, Twitter and Facebook). The data were collected using an 18-item Personal Information Form including socio-demographic characteristics (age, gender, marital status, education, income status, family type, presence of chronic illness, etc.) of adults information sources about COVID-19, what they do for protection and whether COVID- 19 affects their mental health. In addition, the State Anxiety Inventory (STAI-TX) and Health Perception Scale (PHS) were used.

Table 2. STAI, PHS total and subscale mean scores (n=931)

	Min-Max	X±SD
STAI	20-80	45.4±11.8
PHS- TOTAL	27-73	46.7±8.0
PHS- Center of Control	5-25	14.0±3.8
PHS- Certainty	4-20	9.9±3.5
PHS- Importance of Health	3-15	11.7±2.1
PHS- Self-awareness	4-15	10.8±2.1

STAI: State Anxiety Inventory; PHS: Perception of Health Scale

State Anxiety Inventory

The State Anxiety Inventory was developed by Spielberger to measure state anxiety (Spielberger, 1983). Oner and Le Comte adapted the inventory into Turkish and conducted its validity and reliability study. The inventory has 20 questions and the total score ranges from 20 to 80. While high scores indicate a high anxiety level, low scores indicate a low anxiety level. Cronbach's Alpha coefficient of the inventory is 0.94 (Öner & Le Compte, 1998). In this study, its Cronbach's Alpha coefficient was found to be 0.76.

Perception of Health Scale

Used in evaluating health perception; the Perception of Health Scale was developed by Diamond et al (Diamond, Becker, Arenson, Chambers, & Rosenthal, 2007). The Turkish validity and reliability of the scale were conducted by Kadioglu and Yildiz. It is a five-point likert scale with 15 items and four subscales (center of control, self-awareness, certainty, importance of health). The lowest and highest scores to be obtained from the scale are 15 and 75, respectively. Cronbach's Alpha coefficient of the scale is 0.77 (Kadıoğlu & Yıldız, 2012). In this study, its Cronbach's Alpha coefficient was found to be 0.74.

Data analysis

The data of the study were evaluated via the SPSS 21.0 (Statistical Package of Social Sciences) package program. In order to determine whether the data was normally distributed or not, the Kolmogorov- Smirnov test was used. It was determined that all data showed normal distribution and analyzes were performed accordingly. Descriptive statistics such as number, mean, standard deviation, percentage, t-test, one-way analysis of variance (ANOVA), pearson correlation analysis, multiple regression analyzes were used in the analysis of the data. A p value of <0.05 was accepted for statistical significance.

Ethical considerations

Ethics committee approval was obtained University Non-invasive Trials Ethics Committee (No: 2020/045, Date: 18.06.2020) and T.C. Research permission was obtained from the Ministry of Health was received for the study. At the top of the digital questionnaire, the purpose of the research and the statement that participation in the research is based on volunteerism was given.

Participants were asked to fill in questions about the study after obtaining informed consent that they voluntarily participated in the study. The identity information of the participants was not recorded in the survey. This study was conducted in accordance with the Principles of Helsinki Declaration.

Results

In the study, it was determined that while there was a significant difference between the STAI mean scores of the participants according to their gender, education, income status and presence of chronic illness ($p<0.05$), there was no significant difference between the STAI mean scores in terms of their marital status, state of working in a healthcare organization, state of having a family member working in a healthcare organization and family type ($p>0.05$) (Table 1).

While there was a significant difference between the PHS mean scores of the participants according to their gender, education, income status, state of working in a healthcare organization, state of having a family member working in a healthcare organization and presence of chronic illness ($p<0.05$), there was no significant difference between the PHS mean scores according to their marital status and family type ($p>0.05$) (Table 1).

As a result of the statistics performed in the study, it was found that the STAI mean score of the participants was 45.4±11.8 and their PHS mean score was 46.7±8.0.

It was determined that there was a negative correlation between the STAI mean score and PHS mean score (r:-0.207** p:0.000) (Table 3).

According to the results of multiple regression analysis, gender ($\beta = -0.120, p = .000$), education ($\beta = .105, p = .0001$), income status ($\beta = -.149, p = .000$), chronic illness.

Table 3. Correlation of the STAI and PHS total and subscale scores

	STAI	PHS-total	PHS- Center of control	PHS- Certainty	PHS- Importance of Health
PHS- Total	r=-0.207** p=0.000				
PHS- Center of control	r=-0.148** p=0.000	r=0.772** p=0.000			
PHS- Certainty	r=-0.126** p=0.000	r=0.711** p=0.000	r=0.346** p=0.000		
PHS- Importance of health	r=-0.121** p=0.000	r=0.529** p=0.000	r=0.194** p=0.000	r=0.137** p=0.000	
PHS- Self-awareness	r=-0.179** p=0.000	r=0.464** p=0.000	r=0.323** p=0.000	r=0.252** p=0.000	r=0.407** p=0.000

STAI: State Anxiety Inventory; PHS: Perception of Health Scale; **Pearson Correlation

Table 4. Results of multiple linear regression analysis concerning the STAI and PHS and some relevant factors

	STAI				PHS				
	B	**β**	**95% CI for *B***	***p*-value**	***B***	**β**	**95% CI for *B***		***p*-value**
Gender	-2.967	-0.120	-4.521,1.414	0.000*	2.443	0.146	1.381	3.505	0.000*
Education	1.432	0.105	0.563,2.302	0.001*	0.101	0.011	-0.494	0.695	0.739
Working in a healthcare facility	-2.318	-0.051	-5.343,0.706	0.133	-1.305	-0.042	-3.373	0.762	0.216
Having a family member working in a healthcare facility	0.925	0.029	-1.200,3.049	0.393	-1.331	-0.061	-2.783	0.121	0.072
Income status	-2.698	-0.149	-3.837,1.558	0.000*	0.816	0.066	0.037	1.595	0.040*
Presence of chronic illness	-3.183	-0.085	-5.540,0.825	0.008*	1.871	0.074	0.260	3.482	0.023*

STAI: State Anxiety Inventory, PHS: Perception of Health Scale *p < .05. CI: confidence interval.

The presence of (β = -.085, p = .0008) was determined to be a risk factor for anxiety level. Gender (β = .146, p = .000), income status (β = .066, p = .0040), presence of chronic illness (β = .074, p = .0023) were determined as risk factors for health anxiety (Table 4).

It was determined that 70.2% of the participants followed the information about COVID 19 on the internet and on TV, 62.8% from ministries and government institutions, 51% from social media, 14.2% from health professionals, 51% from friends and relatives, 9.9% from scientific articles (Figure 1).

It was determined that 48.5% of the participants had concerns about the future, 41.8% were afraid of the virus, 41.2% were afraid of catching the virus, 37.9% had sleep disorders, and 22.3% showed obsessive behaviors (Figure 2).

Discussion

In this study, which examined the relationship between the level of anxiety caused by the COVID-19 pandemic in Turkey and the perception of health in adults, it was determined that as the health perceptions of individuals increased, their anxiety levels decreased. In the study, it was determined that the anxiety caused by COVID-19 was higher in women than men (Table 1). Since the studies have reported that women have a higher anxiety level than men in the COVID-19 pandemic (Ekiz, Ilıman & Dönmez, 2020; Eren, 2021; Göksu & Kumcağız, 2020; Kwok et al., 2020; Saruç & Kızıltaş, 2021; Solomou & Constantinidou, 2020; Wang et al., 2020; Zhang et al., 2020), the result of the study is compatible with the literature. The fact that women have a greater risk perception than men may increase their anxiety level. In the study it was found that people with a higher educational level had less anxiety (Table 1). The studies conducted indicate that people with a lower educational level have a higher anxiety level related to the COVID-19 pandemic (Doğan & Düzel, 2020; Eren, 2021; Wang et al., 2020). The result of the study is compatible with the literature. When educated people obtain more knowledge about COVID-19, this may differentiate their viewpoint of pandemic and reduce their anxiety level. People with a higher educational level have a higher knowledge level about COVID-19 and better attitudes (Zhong et al., 2020). Imperfect, wrong, and distorted information creates an uncertainty and increases anxiety (Kaya, 2020).

In the study, it was determined that people with a lower income level due to COVID-19 pandemic had a higher anxiety level (Table 1). Also in their study, Cao et al., determined that economic stress factors were positively correlated with anxiety symptoms (Cao et al., 2020). In addition, in Eren's study, it was stated that individuals with low economic levels had higher levels of anxiety than those with medium and high levels (Eren, 2021). The result of the present study is compatible with the literature. Increase of health expenditures due to the infection of COVID-19 and idea of not meeting basic needs due to unemployment may increase anxiety.

In the study, it was determined that people with chronic illnesses had a higher anxiety level (Table 1). The studies have indicated that people with chronic illnesses have higher anxiety related to COVID-19 (Günaydın & Baykal, 2020; Luria et al., 2020; Özdin S. & Özdin,Ş 2020). In the study of Wieteska-Miłek et al., it was determined that COVID 19 has an effect on the anxiety levels of individuals with chronic diseases (Wieteska-Miłek et al., 2021). In the study of Kaya et al., it was found that the anxiety levels of individuals with chronic diseases increased when they encountered COVID-19 patients or when a relative had COVID-19 (Kaya et al., 2021). Voorend et al., in their study, found that COVID 19 increased the anxiety level of chronic kidney patients (Voorend et al., 2021). This finding is compatible with the literature. News on the social media and TV stating that COVID-19 shows a more severe course and may even cause death in people with chronic illnesses, may increase people's anxiety. In the study, it was determined that women's health perception levels were higher than men's. (Table 1). In their study, Karaoğlu, Karaoğlu and Yardımcı (2020) found that women had a higher health perception than men, which makes the

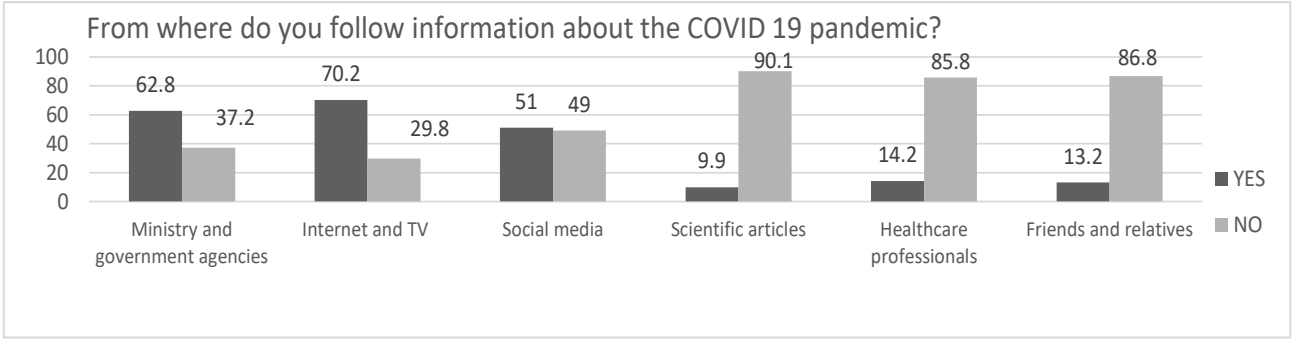

Figure 1. Participants' COVID -19 information resources

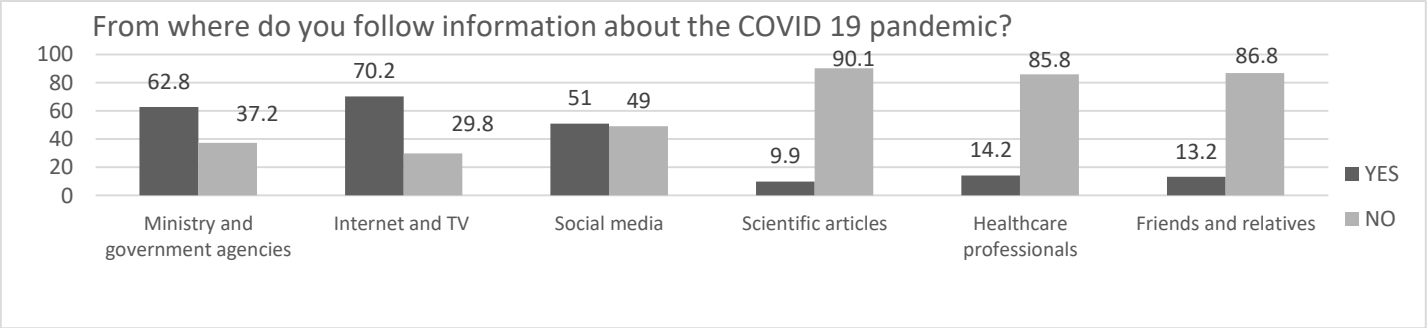

Figure 2. Mental state of the participants in the COVID-19 period

result of the present study in agreement with the literature. The fact that women go through more risky life periods than men may cause an increase in health-seeking behaviors and health perception. In the study by Caka et al. (2017) there was no difference between the genders in terms of health perception, which is different from with the present study. This difference may be associated with health behaviours and health responsibility of the individuals and health habits of the society they live. In the study it was found that as educational level increased, health perception level increased (Table 1). In their study, Altay et al., (2016) found that educational level did not change people's health perception, which is different from the present study. This difference may be associated with socio-cultural environment, mental capacity and health literacy of people and obtaining information from social media.

According to the definitions of the participants, it was determined that people with a higher income status had a higher health perception level (Table 1). In their study, Efteli and Khorshtd (2016) stated that people with a higher monthly income had a more positive health perception. This result is compatible with the literature. The fact that people with a higher economic level had a lower anxiety level, may cause them to perceive their medical condition better. In the study, it was determined that people with chronic illnesses had a higher health perception level (Table 1). In their study, Ozdelikara, Agacdiken-Alkan and Mumcu (2018) indicated that people who had a family member with chronic illnesses had a higher health perception level. This result is compatible with the literature. Healthy lifestyle activities regarded by people with chronic illnesses in order not to face other health issues and their experiences about the diagnosis and treatment process, may affect their health perception.

It was determined that the health anxiety mean score (45.4±11.8) of the participants was above the medium level compared to the Health Anxiety Inventory total score (max: 80) averages (Table 2). Also in the studies it was found that anxiety level of people was medium (Ekiz, Ilıman & Dönmez, 2020; Ozdelikara et al., 2018; Wang et al., 2020). The result of the present study is not compatible with the literature. Symptoms of COVID-19 and its effects on individuals, mortality rates in the pandemic, effects of lifestyle changes and lockdown process on individuals, presence of chronic illness in the individuals or their relatives, treatment expenses, economic condition and fast spread of rumours and misinformation about the pandemic via social media may increase anxiety. It was determined that the health perception mean score of the participants was at the medium level (Table 2). Also in their study Ozdelikara et al., (2018) stated that health perception of individuals was at the medium level. The result of the present study is compatible with the literature. People's viewpoint of health, health responsibility, self-perception style, knowledge about the pandemic and attitudes toward the pandemic may affect health perception.

In the study, it was determined that there was a negative correlation between the health anxiety mean score and health perception mean score (Table 3). Also, in their study, Karaoglu, Karaoğlu and Yardımcı (2020) determined that there was a negative correlation between health perception and health anxiety. This finding of the present study is compatible with the literature. Individuals' perception of health can affect their health behaviors and health responsibility, which may reduce their anxiety. In addition, positive thoughts about one's own health can reduce the level of anxiety. Health perception or perceived medical condition is a combination of the person's emotions, thoughts, prejudices, and expectations about his/her own health (Karaoglu et al., 2020).

Strengths and Limitations of the Study

This study is important in terms of evaluating people's psychological condition in the pandemic period. The state anxiety and health perception levels of the people in the pandemic period were evaluated cross-sectionally. Major limitations are that it is difficult to apply sampling methods due to the pandemic; thus, the study was conducted with an online survey. The exclusion of people who do not use the internet, smart phones or computers in the study is another limitation of the study.

Conclusion and Recommendations

In this study, it was determined that the anxiety levels and health perception levels of the individuals participating in the study during the COVID-19 pandemic were above the moderate level, and their anxiety levels decreased as their health perceptions increased. It was determined gender, education level, income status, presence of chronic disease were determined as risk factors for anxiety level, and gender, income status, presence of chronic disease were determined as risk factors for health anxiety.

In line with these results, it is recommended to during the pandemic process, it is recommended to develop preventive health policies that will reduce the anxiety levels of adults, increase the perception of health and cause positive changes in health-seeking behaviors. Implementing mechanisms that will enable adult individuals to access accurate information and providing psychological support services to health vulnerable groups will be protective in terms of public health.

Conflict of interest

There is no conflict of interest.

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Ethics Committee Approval

Ethics committee approval was obtained University Non-invasive Trials Ethics Committee (No:2020/045, Date:18.06.2020) and T.C. Research permission was obtained from the Ministry of Health was received for the study.

Informed Consent

Informed consent was obtained from all individual participants included in the study. In the top side of the survey, which was submitted to the participants, there was information about the purpose and content of the study and voluntary basis of the study.

Peer-review

Externally peer-reviewed.

Author Contributions

F.P.: Idea, Consulting, Data Collection and/or Data Processing, Analysis and/or Interpretation, Literature Review, Writing the Article, Critical Review.

L.D: Idea, Consulting, Data collection and/or Data Processing, Analysis and/or Interpretation, Article Writing, Critical Review

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