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Anxiety, protective behaviors and related factors during the COVID-19 outbreak: A cross-sectional study

COVID-19 Salgını Sırasında Anksiyete, Koruyucu Davranışlar ve İlişkili Faktörler: Kesitsel Bir Çalışma

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ABSTRACT

Aim: This study aims to determine the anxiety, personal protective behaviors, and related factors in Turkish society during the COVID-19 pandemic.
Patients and Methods: The sample consisted of 617 volunteer participants aged 18 to 75, living in the community and literate. Research approval, purpose, and questions were delivered to individuals in an online environment using a link and forms were collected by asking the participants to send back the completed questionnaires to the online environment. A COVID-19 data form and the State-Trait Anxiety Inventory (STAI-State) were used to collect the data.
Results: The study evaluated data from the 617 participants: 59.48% (n = 367) of the study participants were female and 40.52% (n = 250) were male. We found increased anxiety levels in the participants, with high levels of anxiety in 30.79% (n = 190). The main personal protective behavior was "washing hands frequently" (84.76%). Personal distance and mask usage rates were low (8.6% and 5.02%, respectively). We found higher anxiety levels in men (p = 0.008), people with chronic diseases (p = 0.003), the elderly (p<0.001) and those with lower education levels (p<0.001). We found higher levels of anxiety in those showing avoidance behaviors.
Conclusions: The results of our study show that psychological consequences should be considered in addition to the physical outcomes of the COVID-19 outbreak and that some subgroups have a higher risk of anxiety. People who require professional support should be identified and psychological support should be planned.

Keywords: COVİD-19, pandemics, anxiety, protective behavior

ÖZ

Amaç: Bu çalışmada COVİD-19 pandemisi sırasında Türk toplumunda anksiyete, kişisel koruyucu davranışlar ve ilişkili faktörleri incelemeyi amaçlanmıştır.
Hastalar ve Yöntem: Örneklemimizi 18-75 yaş arası, okur-yazar, çalışmaya gönüllü 617 birey oluşturmuştur. Araştırma onamı, amacı ve sorular soft ortamda bireylere bir link vasıtasıyla ulaştırılmış ve formlar yine soft ortamda cevaplanan anketlerin iletilmesiyle toplanmıştır. Verilerin toplanmasında, araştırmacılar tarafından oluşturulan COVİD-19 ile ilgili soruları ve sosyo-demografik verileri içeren form ve Durumluk-Sürekli Kaygı Envanteri (STAI-Durumluk) kullanıldı.
Bulgular: Çalışmada 617 gönülle değerlendirilmiştir. Çalışmaya katılanların %59.48 (367)'i kadın, %40.52 (250)'si erkekti. Katılımcıların % 30.79 (190)'unda yüksek seviyede kaygı düzeyleri saptanmıştır. Başlıca gerçekleştirilen kişisel koruyucu davranış yüksek oranda elleri sık sık yıkama şeklindedir. (%84.76). İkinci sıklıkta ise insanlarla en az bir metre mesafe koyma davranışıdır. (%8.6). Katılımcıların %5.02 (31)'i maske takmakta, %1.62 (10) kişi ise hiçbir koruyucu önlem almamaktadır. Çalışmada erkeklerde (p=0.008), tanılanmış kronik hastalığı olanlarda (p=0.003), yaşlılarda (p<0.001) ve daha düşük eğitim düzeyi olanlarda (p<0.001) daha yüksek kaygı düzeyleri saptanmıştır. Kişisel koruyucu davranışlardan kaçınıcı davranış yüksek kaygı düzeyi ile ilişkili bulunmuştur.
Sonuç: Çalışmamızın sonuçları, COVID-19 salgınının fiziksel sonuçlarına ek olarak, psikolojik sonuçların da dikkate alınması gerektiğini göstermektedir. Çalışmamızda bazı alt gruplarda kaygı riski daha yüksek belirlenmiştir. Profesyonel desteğe ihtiyaç duyan insanlar tanımlanmalı ve psikolojik destek planlanmalıdır.

Anahtar kelimeler: COVİD-19, pandemi, anksiyete, koruyucu davranışlar

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INTRODUCTION

Unrecognized pneumonia cases in the city of Wuhan, in the Hubei province of China, were reported in late December 2019 and a new coronavirus with the same origin but different genetic features as the coronavirus that causes of SARS (severe acute respiratory syndrome), was identified [1, 2]. This new coronavirus (2019-nCoV) is thought to have been first transmitted from an intermediate host, likely a bat, to humans, however the facts that the virus has travelled beyond the first place of occurrence and is seen in healthcare workers, confirmed interpersonal transmission through droplets [3]. The International Committee on Taxonomy of Viruses (ICTV) announced the name of this new virus as "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2) on February 11, 2020 [4]. On January 30, 2020, the World Health Organization (WHO) named it Coronavirus Disease 2019 (COVID-19) and declared it an internationally alarming public health situation, as a pandemic, on March 11, 2020 [5].

COVID-19 spread rapidly all over the world after the first case in China on December 19. In Turkey, the first case was reported on March 10, 2020 and as of April 4, 2020, a total of 24,934 cases had been reported and the number of deaths due to COVID-19 infection was reported to be 501.

This is not the first epidemic the world has recently faced. Previously, epidemics of SARS in 2003, Influenza A H1N1 (swine flu) in 2009, MERS in 2012, Ebola in 2014 and Zika in 2015, have occurred. Studies on anxiety and related factors were also conducted in previous epidemics as pandemic viral diseases are associated with increased anxiety in populations [6, 7]. A study conducted in 2009 with the participation of 6,249 online participants reported high anxiety related to the pandemic emotional variables, such as self-reported anxiety over the epidemic to mediate the possibility of participatory protective behaviors [8]. A community-based study conducted with 1,210 participants in China reported 53.8% of the participants were psychologically affected at different levels, ranging from moderate to severe, in the course of the COVID-19 epidemic [9].

Psychological reactions during a pandemic have the particular potential to cause fear and fear-related behaviors, to accelerate the spread of disease, to reduce life-saving interventions, to intensify psychological distress and to compound psychosocial outcomes [10]. The psychological effects of an epidemic can be more common than its somatic effects, be more destructive, and last longer. In fact, previous research has revealed that the fear of epidemics has more negative effects than the epidemic itself [11].

In the literature, the possibility of people adhering to health recommendations has been reported as being higher if they believe the disease has serious consequences, if the probability of being affected by the epidemic is high, if the disease is difficult to treat, if the proposed behaviors are effective, and if the government provides clear and adequate information about the epidemic; they become more confident in their determination to control the spread of the infection [12, 13].

Although close results have been reported about pandemic-related psychiatric and behavioral responses in different societies, psychological reactions and behavioral responses have been reported to conceivably differ among cultures in pandemic cases [14-16]. As such, studies to be carried out in different cultures in epidemic situations may help in obtaining data from that culture and in taking culture-specific measurements. In this study, we aimed to examine anxiety levels, personal protection behaviors and related factors during the COVID-19 epidemic.

MATERIALS AND METHODS

This cross-sectional study was conducted online, using snowball sampling techniques, from March 23 to March 28, 2020. The online survey was developed using Google Docs and the data was collected through various techniques from social media, namely, Twitter, Facebook and WhatsApp. In total, 617 participants took part in the survey, which allowed for only one response per person. Electronic informed consent was obtained from each participant prior to starting the investigation and participants were able to withdraw from the survey at any moment, without providing any justification. The study was approved by the ethics committee of Alanya Alaaddin Keykubat University Clinical Research. (05.06.2020/19-16).

Instruments and data collection

Data form. This is structured in three parts. The first part involved socio-demographic characteristics (e.g., gender, age, and education level). The second part involves health and disease characteristics (diagnosed diseases). The third part is about characteristics of COVID-19 (information and protection methods).

The State-Trait Anxiety Inventory (STAI): The original inventory was developed in 1970 by Spielberger et al. and consists of 40 items. It has two subscales that measure State and Trait anxieties using a 4-point Likert-type scale. The Turkish validity and reliability study for the scale was performed by Öner and Le Compte in 1985 [17]. Total scores can range from 20 to 80, whereas a higher score obtained on the scale shows higher anxiety and worry levels.

Ercan et al.'s study aimed to determine a cut-off score for the STAI state and trait anxiety subscales to differentiate between healthy adults and those with anxiety disorders. This study found a cut-off value of 41 to be optimal (sensitivity = 78.3; specificity = 71.2) for the STAI-State [18].

In our study, only the State Anxiety Scale was used because of its allowance for describing how the individual feels at a certain time and under certain conditions, and takes into account one's feelings about the situation.

Data Analysis

Frequency and percentage values were calculated for the categorical variables. The Kruskal-Wallis H test was used to compare continuous, independent variables between the two groups and the Mann-Whitney U test was used to compare two independent and non-normally distributed variables. The latter is used for comparing between the two groups whereas the former is used for further group comparisons. Probability ratios and 95% confidence intervals were calculated: p values <.05 were regarded as statistically significant. IBM's (2013) SPSS Statistics for Windows (Version 22.0, Armonk, NY) was used for data analysis.

RESULTS

The participants (N = 617) in the study were categorized according to their age and the majority were in the group of 18 to 25 years old (45.37%). The majority of respondents were female (59.48%), single (58.5%), university graduates (48.75%), with mid-range incomes (48.78%) and no children (60.61%). Some 3% of the participants had traveled abroad in the previous month (see Table 1), whereas 21.55% of the participants were diagnosed with a chronic disease.

Table 1: Participants' Socio-Demographic Characteristics (N = 617)

		n	%
Gender	Female	367	59.48
	Male	250	40.52
Age	18-25	280	45.37
	26-35	101	16.35
	36-45	133	21.55
	46-55	60	9.76
	56 or older	43	6.97
Marital Status	Married	256	41.5
	Single	361	58.5
Economic Status	Income less than expenses	177	28.69
	Income and expenses equal	301	48.78
	Income more than expenses	139	22.53
Education Status	Literate / Secondary school	49	7.94
	High school	179	29.01
	University	301	48.75
	Master and above	88	14.30
Having children	Yes	243	39.39
	No	374	60.61
Traveling abroad in the last 1 month	Yes	18	3
	No	599	9

The responses from the participants regarding their information status and protective behavior regarding COVID-19 are shown in Table 2: 69.21% (n = 427) of the participants declared having low anxiety whereas 30.79% (n = 190) reported having high anxiety.

The participants' mean STAI-State score was 39.44, with the average STAI-State score for men was 39.79. Men declared having higher anxiety levels than women and this gender difference is statistically significant (p = 0.08)

The lower a participant's education level, the higher their anxiety levels. Here again, the difference was statistically significant (p<0.001).

Participants whose income is higher than their expenses had statistically significantly higher anxiety levels than those with worse economic situations (p = 0.022). Those diagnosed with any chronic disease are found to have higher anxiety levels and the difference was statistically significant (p = 0.003) and having knowledge about COVID-19 was associated with having higher anxiety rates (p = 0.017).

The participants were separated into two groups: those with protective behaviors (frequent hand washing) and those with avoidance behaviors (social distancing, wearing mask/gloves). Participants with avoidance behaviors had higher anxiety levels than participants with protective behaviors (p<0.001). When evaluating STAI-State scores in terms of the other variables, no statistically significant relationship was found (see Table 3).

Table 2: Participants' Information Status on COVID 19 (N = 617)

		N	%
Information level on COVID19	None	25	4.05
	Little	243	39.39
	A lot	349	56.56
My primary source of information on COVID 19*	TV	105	17.01
	Internet	324	52.51
	Scientific article	179	29.01
	Friend/relative	9	1.47
The main action taken for protection *	Nothing	10	1.62
	Mask and distance	84	13.62
	Frequent hand washing	523	84.76
COVID 19 affects my mental health	Agree	358	58
	Do not agree	259	42

* Participants could not make more than one selection.

DISCUSSION

As previous studies have shown differences in the psychological reactions and behavioral responses between societies and cultures to be revealed in pandemic situations [15], we aimed to examine anxiety, personal protective behaviors and related factors in Turkish society during the COVID-19 pandemic. our study revealed a high level of anxiety in 30.79% of the participants, which is a result compatible with studies conducted during the COVID-19 infection. Qiu et al.'s study detected psychological stress in 35% of the participants [19] whereas Rubin et al. (2009) reported 23.8% to have major concerns in response to the epidemic in the early stages of the H1N1 influenza outbreak [20].

We found male participants to have higher anxiety levels than the female participants and the difference was statistically significant. Previous studies have found higher levels of anxiety in female participants, which has also been associated with a higher level of anxiety sensitivity in women [19, 20]. The result we obtained may result from the fact that men are often the principal income providers of the family, that they undertake the economic burden and feel responsible for the potential economic consequences of the epidemic. Additional studies are required to further examine these correlations.

A study examining psychological reactions and factors related to the COVID-19 epidemic reported anxiety, depression and stress to be significantly related to chronic diseases [9]. In accordance with the current literature, our study revealed that having a chronic disease significantly relates to anxiety levels; the COVID-19 virus having more negative outcomes for people with advanced age or chronic disease in particular may explain this result.

We found the Internet to be the most common source of information about COVID-19 (52.51%) and this is compatible with other current studies [9]. In addition, the information in these regarding the increase of cases experiencing recovery has been found to be significantly associated with a decrease in stress levels [9].

The studies examining the relationship between anxiety levels and preventive measures have revealed confusing results. Increased anxiety has been positively associated with the possibility of participating in proposed behavioral changes, such as washing hands and disinfecting door handles [21]. One study conducted during the 2003 SARS epidemic found preventative behaviors to positively and significantly relate to moderate anxiety, whereas a recent study during the COVID-19 pandemic has revealed opposite results [9, 22].

Our study has unexpectedly found a relationship between the levels of self-reported knowledge about COVID-19 and anxiety: it appears that as

Table 3: Distribution of Participants' STAI-State Scores (N = 617)

			n	Anxiety Level		Z	p
				Low	High		
Gender		Female Male	367 250	269 158	98 92	-2.665	.008**
Marital Status		Single Married	361 256	247 180	114 76	-0.501	.216
Having children		Yes No	243 374	167 260	76 114	0.209	.835
Traveling abroad in the last 1 month		Yes No	18 599	10 417	8 182	-1.272	.203
Diagnosed with any chronic disease Diagnosed with any chronic disease		Yes No	133 484	74 335	59 149	-2.931	.003**
Attending any training about COVID 19		Yes No	60 557	38 371	22 186	-0.434	.664
Mann-Whitney U, p < 0.001; ** 0.001 ≤ p < 0.01; * 0.01 ≤ p < 0.05							
					Chi-Square	df	p
Age	-25 26-35 36-45 46-55 55 and above	280 101 133 60 43	183 75 94 43 14	97 26 39 17 29	24.747	6	<.001***
Education level	Literate / Secondary school High school University Master and above	49 179 301 88	22 109 216 62	27 70 85 26	18.338	3	<.001***
Economic status	Income less than expense Income and expense equal Income more than expense	177 301 139	107 213 89	70 88 50	7.657	2	.022*
Information level on COVID19	Have not Some Have	25 243 349	15 176 270	10 67 79	10.144	3	.017*
My primary source of info. on COVID 19*	TV, Friend Internet Scientific article	114 324 179	75 220 116	39 104 63	.841	3	.840
The main action taken for protection	Nothing Mask and Distance Frequent hand washing	10 84 523	9 39 361	1 45 162	18.310	2	<.001***
Kruskal Wallis Test, *** p < 0.001; ** 0.001 ≤ p < 0.01; * 0.01 ≤ p < 0.05 STAI: State-Trait Anxiety Inventory (STAI)"							

knowledge about COVID-19 increases, so do anxiety levels. Previous studies have reported similar results on the relationship between zika virus-related information and anxiety [23]. Considering the cross-sectional structure of our study, this may be the result of some participants who already have anxiety about it are coping by seeking additional information about COVID-19. It should be noted that we did not measure actual levels of knowledge about COVID-19 in our participants.

Anxiety levels for individuals with low education levels were significantly higher statistically than those with high education levels and similar results have been reported in previous studies [29]. This result may have different causes, including the possibility that low education levels may foster economic concerns associated with having a low socioeconomic level, and therefore indirectly with the epidemic.

In our study, we have found hand washing to be the most common personal protective behavior and that the use of masks and social distancing between people had rarely been applied. Where protective measures are concerns, different practices emerge from different cultures; for

example, a study conducted in China in 2004 reported the use of masks for protection from the epidemic to be 62.1%, whereas in our study, we found it to be 5.02%. Elsewhere, a community-based study on swine flu in the UK reported that 72% of people did not change the frequency of their hand washing [24]. Additionally, we found higher levels of anxiety in those who exhibited avoidance behaviors and this result is compatible with previous studies in our country, during the swine flu [25].

Our study incurred some limitations, including the fact that the data emerged from cross-sectional studies and that causality cannot therefore be determined. As a result, the associations should be interpreted with caution, as reverse causality cannot be dismissed. Additionally, no psychiatric evaluation was performed on the participants, no details were sought regarding the chronic diseases and measurements were performed using self-reporting scales, which raises the limitations of common method bias.

As a result of our study, however, we have found the existence of a highly increased level of anxiety during a pandemic. As far as we know from previous pandemic studies, the psychological effects of a such an event continue long after it ends, therefore support programs may be needed for those requiring psychological professional help: online during the course of the epidemic and face-to-face afterward. We also showed that the participants had obtained information on the epidemic mostly from the Internet. As shown in previous studies, emphasis on the number of recovery cases and correct information reduces anxiety levels, therefore this type of information flow over the Internet should be provided. In general, we found that the participants mostly performed personal protective behaviors, with hand washing being the most prevalent. More emphasis should be placed on social distancing and the use of masks and gloves.

Strategies such as vaccination and antiviral treatment, hygienic practices, and social distancing are known to play a vital role in controlling the spread of disease during a pandemic. As no effective treatment or vaccine is available yet for COVID-19, hygiene, preventive behaviors, and social isolation have become more important and this also requires changing existing habits and replacing them with specific social behaviors. It also requires the public authority to render important decisions for serious protective measures.

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