



Psychological Stress and chronic disease management During the COVID-19 Pandemic in Turkey: A Cross-sectional Web-based Study

Türkiye’de COVID-19 Salgını Sırasında Psikolojik Stres ve Kronik Hastalık Yönetimi: Web Tabanlı Kesitsel Çalışma

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ABSTRACT

Objective: To determine the levels of chronic disease management and psychological stress in the era of pandemic, and to evaluate the relationship between them.

Methods: In this cross-sectional study, the sample consisted of 233 patients with chronic diseases. The data were collected with Personal Information Form, the Coronavirus disease-19 (COVID-19) Related Psychological Distress scale (CORPD) and the Patient Assessment of Chronic Illness Care (PACIC) between April 15 and September 30, 2021. The data were collected online via Google Forms and analyzed using number, percent, standard deviation, mode, mean, median, Spearman’s correlation, Kruskal-Wallis, Mann-Whitney U, post-hoc multiple comparisons.

Results: The mean CORPD score of the participants was 41.87 ± 10.12 , and the mean PACIC score was 63.36 ± 19.26 . Male participants with high school degrees, with low-income and health perception and with respiratory diseases had significantly higher mean PACIC score. Female participants with high school degrees, with low-income perception and with cardiovascular diseases had significantly higher CORPD score ($p < 0.05$).

Conclusion: Research results showed that moderate psychological stress and suspicion had a positive and stimulating effect on patients’ chronic disease management. It is recommended to evaluate the long-term effects of psychological stress, and its impact on chronic disease management in further research.

ÖZ

Amaç: Pandemi döneminde kronik hastalık yönetimi ve psikolojik stres düzeylerini belirlemek ve aralarındaki ilişkiyi değerlendirmektir.

Yöntemler: Kesitsel tipteki bu çalışmanın örneklemini kronik hastalığı olan 233 hasta oluşturdu. Veriler 15 Nisan-30 Eylül 2021 tarihleri arasında Kişisel Bilgi Formu, Koronavirüs hastalığı-19 (COVID-19) ile ilişkili Psikolojik Sıkıntı Ölçeği ve Kronik Hastalık Bakımını Değerlendirme Ölçeği ile toplandı. Veriler, Google Forms aracılığıyla çevrimiçi olarak toplandı ve sayı, yüzde, standart sapma, mod, ortalama, medyan, Spearman korelasyonu, Kruskal-Wallis, Mann-Whitney U, post-hoc çoklu karşılaştırmalar kullanılarak analiz edildi.

Bulgular: Katılımcıların ortalama COVID-19 ilişkili Psikolojik Sıkıntı Ölçeği puanı $41,87 \pm 10,12$, Kronik Hastalık Bakımını Hasta Değerlendirmesi Ölçeği puanı $63,36 \pm 19,26$ idi. Lise mezunu, gelir ve sağlık algısı kötü, solunum yolu hastalığı olan, erkek katılımcıların Kronik Hastalık Bakımını Hasta Değerlendirmesi Ölçeği puan ortalamaları anlamlı olarak daha yüksekti. Lise mezunu, gelir algısı kötü, kardiyovasküler hastalığı olan, kadın katılımcılarda COVID-19 ilişkili Psikolojik Sıkıntı Ölçeği puanı anlamlı olarak daha yüksekti ($p < 0,05$).

Sonuç: Araştırma sonuçları, orta düzeyde psikolojik stres ve şüphenin, hastaların kronik hastalık yönetimi üzerinde olumlu ve uyarıcı bir etkiye sahip olduğunu göstermiştir. İleri araştırmalarda

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ABSTRACT

Keywords: COVID-19, pandemics, psychological stress, disease management, chronic diseases

ÖZ

psikolojik stresin uzun vadeli etkilerinin ve kronik hastalık yönetimi üzerindeki etkisinin değerlendirilmesi önerilir.

Anahtar Sözcükler: COVID-19, pandemi, psikolojik stres, hastalık yönetimi, kronik hastalık

Introduction

The coronavirus disease-2019 (COVID-19) emerged in December 2019. Globally, there were approximately 6.7 million deaths and it reached over 101.4 thousand deaths in Turkey (1). While emergency health care applications were increased to prevent the spread of coronavirus all over the world, routine services (screening, monitoring, access to health care providers and essential medications, diagnosis, etc.) were disrupted, which changed the priority and delivery of health services (2-7). Hospitals have reorganized their medical and surgical activities since the onset of the pandemic. They have had to suspend non-urgent procedures and surgeries, postpone scheduled treatments and patient transfers, place restrictions on visiting patients and face-to-face consultations. Although these measures have reduced the workloads of hospitals, they have increased the burden of disease in the long term. During this period, a significant increase was observed in cardiovascular complications, and admissions to the emergency department (2-6). In addition, since the start of the pandemic, mortality due to heart failure has tripled, while hospitalization rates have decreased by 40-50% (2). In addition to routine health services during the pandemic, serious changes due to curfews and quarantines have occurred in all areas of life, such as decreased physical activity, sleep problems, smoking and alcohol use, obesity, higher psychological stress. It is reported that all these changes will bring along the burden of chronic disease, psychological and economic problems in the long term, in addition to the risk of COVID-19 (2-4,7-9).

Millions of people have experienced fear, anxiety, and panic because of the COVID-19 and preventive measures, such as lockdowns, curfews, social isolation, restrictions, etc. They have also suffered personal and economic losses since the beginning of the pandemic. However, the pandemic has been particularly detrimental to patients with chronic diseases as they end up experiencing chronic stress, anxiety, depression, etc. (2,7-11). Stress causes gastrointestinal disorders and cardiovascular diseases (12). Too much pandemic related psychological stress makes people more vulnerable to chronic diseases. For this reason, it is extremely important for health professionals to consider mental risks in the prevention and management of diseases (8). Moreover, they should evaluate the psychological stress levels of patients with different chronic diseases and encourage them to manage their diseases (13).

The study had two objectives: (a) determining the levels of chronic disease management and psychological stress in the era of pandemic and (b) evaluating the relationship between

psychological stress and chronic disease management. These results will contribute to the literature and encourage healthcare professionals to monitor the psychological stress levels of patients with chronic diseases and manage their conditions. The main research questions were as follows:

- (1) What were the psychological stress and chronic disease management levels of participants during the COVID-19 pandemic?
- (2) Was there any significant connection between sociodemographic variables and the COVID-19 Related Psychological Distress Scale (CORPD) and the Patient Assessment of Chronic Illness Care (PACIC) scores?
- (3) Was there any correlation between CORPD and PACIC scores?

Methods**Study Design**

A cross-sectional design was used for this study.

Participants

The study population consisted of all voluntary adult patients with at least one chronic disease for more than six months, and living in Turkey. Considering that the burden of chronic diseases in Turkey is 15.6 million (14) and the total population is 83.61 million (15), it is seen that the incidence of chronic diseases is 18.6%. In this direction, using the online sample calculation tool (www.calculator.net), it was calculated that the minimum number of people to be sampled (with 95% confidence level, 5% tolerance and 80% power) was 233. Participants (n=233) were selected by snowball sampling. The inclusion criteria of the study were:

- Being over 18 years old,
- Having at least one chronic disease for more than six months,
- Being literate,
- Agreeing to participate in the study,
- Having no visual, auditory, or cognitive problems.

After being informed about the research, those who agreed to participate started filling out the scales by clicking the "Agreed" button in the web-based survey.

Data Collection

The data were collected online via a web-based survey software (Google Forms) between April 15 and September 30. Each participant took 10-15 minutes to complete the collection forms. Each participant filled out the data collection forms only once.

Measures

The Personal Information Form, CORPD, and PACIC were used in the measurements.

The Personal Information Form: It was a 20-item form created by researchers to collect sociodemographic (age, education, marital status, etc.) and health information (chronic diseases, medications, etc.).

The COVID-19 Related Psychological Distress Scale (CORPD): It consists of two subscales (1-suspicion and 2- anxiety and fear) and 12 items (16). The scale, adapted into Turkish by Ay et al. (11), is used to measure the level of psychological stress in people who are not infected with COVID-19. The total scores of the five-points Likert-type scale range from 12 to 60. As the score increases, the severity of the psychological stress increases. The Cronbach's alpha of the scale in Turkish was 0.88 (11). Cronbach's alpha values of the total scale (0.93), suspicion subscale (0.89), and anxiety-fear subscale (0.90) were high in this study.

The Patient Assessment of Chronic Illness Care Scale (PACIC): It consists of 20 items and five subscales (1- patient activation, 2- delivery system design, 3- goal setting, 4- problem-solving, and 5- follow-up/coordination) (17). The scale, adapted into Turkish by İncirkuş and Nahcivan (18), assesses the extent patients report receiving care within the past six months. High scores on this 5-point Likert-type scale indicate that individuals with chronic disease are satisfied with their received care and that chronic disease management is sufficient. The Cronbach's alpha of Turkish scale was 0.91 (18). Cronbach's alpha values of the total scale (0.83), goal-setting subscale (0.85), patient activation subscale (0.85), problem-solving subscale (0.89), delivery system design subscale (0.81), and follow-up/coordination subscale (0.89) were high in this study.

Ethical Approval

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The scientific research ethics committee approval was obtained (no: 09/17, date: 12.04.2021).

Statistical Analysis

The data were analysed using number, percent, standard deviation, mode, mean, median (Q1-Q3), minimum-maximum for descriptive data; The Kolmogorov-Smirnov test for normality testing, Spearman's correlation, Kruskal-Wallis, Mann-Whitney U, post-hoc multiple comparisons, and Cronbach's alpha. All analyses were performed in the Statistical Package for Social Sciences (SPSS, Version 21.0 Armonk, NY: IBM Corp.), and significance level was accepted as $p < 0.05$.

Results

Participants had a mean age of 41.61 ± 14.62 years. Most of the participants were married (66.5%), female (82%), employed (55.4%), had university degrees (54.5%), had a moderate perception for income (61.4%) and health (52.2%). Eighteen participants had been hospitalized during the pandemic (7.7%), primarily due to cardiovascular diseases (51.6%) (Table 1).

Participants had a mean CORPD score of 41.87 ± 10.12 and the PACIC score of 63.36 ± 19.26 , indicating moderate levels of psychological stress and disease management (Table 2).

The CORPD scores significantly differed by gender, education, income, and chronic disease ($p < 0.05$). Participants with cardiovascular diseases had a significantly higher CORPD score than those with thyroid disorders. Participants with high school degrees, with a low-income perception and female participants had a significantly higher CORPD score ($p < 0.05$) (Table 3).

The PACIC scores significantly differed by gender, education, income, type of chronic disease, and perceived health ($p < 0.05$). Participants with a good income, bad health perception, high school degrees and male participants had higher PACIC scores. Scale scores of those with respiratory disease were higher than those with cardiovascular disease (Table 3).

Table 1. Descriptive characteristics of the participants

Variables		n (%)
Gender	Male	42 (18.00)
	Female	191 (82.00)
Marital status	Married	155 (66.5)
	Single	78 (33.5)
Education	Primary	34 (14.6)
	Middle	4 (1.7)
	High	37 (15.9)
	University	127 (54.5)
	Graduate	31 (13.3)
Perceived income	Bad	14 (6.0)
	Moderate	143 (61.4)
	Good	76 (32.6)
Working status	Yes	129 (55.4)
	No	104 (44.6)
Type of chronic disease	Cardiovascular	120 (51.6)
	Endocrine	21 (9.0)
	Respiratory	33 (14.2)
	Thyroid	25 (10.7)
	Cancer	5 (2.1)
	Other (psychiatric etc.)	29 (12.4)
Perceived health	Bad	25 (10.7)
	Moderate	124 (53.2)
	Good	84 (36.1)
Hospitalization	Yes	18 (7.7)
	No	215 (92.3)

The PACIC “patient activation” subscale score was positively correlated with CORPD total and “suspicion” subscale scores ($p < 0.05$). The CORPD “suspicion” subscale score was positively correlated with PACIC “follow-up/coordination” and “problem-solving” subscale scores (Table 4). There was a positive correlation between age and CORPD scores ($p < 0.05$) (Table 5).

Discussion

Patients with chronic diseases had difficulty accessing healthcare services, continuing follow-up and treatments, and obtaining medical supplies and essential medications since the onset of the pandemic (2-7). The pandemic has also made patients with chronic diseases more vulnerable to physical and mental problems such as stress, anxiety, depression, and sleep problems (19). Horesh et al. (20) reported that patients with chronic

Table 2. Medians, mods, means of scales and sub-scales

Scales and sub-scales	Median (Q1-Q3)	Mode	Mean \pm SD	Minimum-maximum
CORPD total	43.00 (38.00-49.00)	43.00	41.87 \pm 10.12	12-60
Anxiety and fear	21.00 (19.00-24.00)	25.00	20.61 \pm 4.75	5-25
Suspicion	25.00 (22.00-30.00)	24.00	24.51 \pm 6.96	7-35
PACIC total	66.00 (48.50-78.00)	70.00	63.36 \pm 19.26	20-100
Patient activation	11.00 (8.00-12.00)	12.00	10.22 \pm 3.13	3-15
Delivery system design	10.00 (9.00-12.00)	12.00	10.19 \pm 3.14	3-15
Goal setting	16.00 (10.00-19.00)	10.00	15.12 \pm 5.28	5-25
Problem solving	14.00 (8.50-16.00)	8.00	13.24 \pm 4.56	4-20
Follow-up/coordination	16.00 (10.00-19.00)	17.00	14.57 \pm 5.76	5-25

CORPD: COVID-19 Related Psychological Distress Scale, PACIC: Patient Assessment of Chronic Illness Care, SD: Standard deviation

Table 3. Comparison of the descriptive characteristics of the participants with the CORPD and PACIC scores

Variables		CORPD median (Q1-Q3)	U/X ² ; p	PACIC median (Q1-Q3)	U/X ² ; p
Gender	Male	37.00 (21.00-47.25)	2522.5; 0.001 ^a	74.50 (70.00-81.00)	2313.5; 0.001 ^a
	Female	43.00 (39.00-49.00)		62.00 (46.00-75.00)	
Marital status	Married	43.00 (39.00-50.00)	5189.50; 0.078 ^a	69.00 (48.00-76.00)	5946.00; 0.838 ^a
	Single	43.00 (36.00-47.00)		65.00 (49.00-79.25)	
Education	Primary	40.00 (34.25-44.00)	16.570; 0.002 ^b	56.00 (48.00-71.00)	25.270; 0.001 ^b
	Middle	41.00 (41.00-41.00)		39.00 (39.00-39.00)	
	High	46.00 (43.00-49.00)		75.00 (62.00-80.00)	
	University	43.00 (37.00-52.00)		65.00 (49.00-79.00)	
	Graduate	42.00 (36.00-43.00)		54.00 (40.00-78.00)	
Perceived income	Bad	49.00 (30.00-52.00)	14.917; 0.001 ^b	79.00 (68.25-100.00)	7.971; 0.019 ^b
	Moderate	43.00 (39.00-51.00)		64.00 (46.00-77.00)	
	Good	42.00 (32.00-46.00)		66.00 (49.00-78.00)	
Working status	Yes	43.00 (37.00-48.50)	5841.0; 0.089 ^a	65.00 (48.00-82.00)	5811.50; 0.079 ^a
	No	45.00 (38.00-50.00)		66.50 (56.00-72.50)	
Type of chronic disease	Cardiovascular	48.00 (39.00-53.25)	17859.0; 0.007 ^b	80.00 (49.00-92.00)	19.431; 0.003 ^b
	Endocrine	42.00 (39.00-43.50)		69.00 (57.50-78.00)	
	Respiratory	43.00 (37.00-51.00)		58.00 (37.00-65.00)	
	Thyroid	36.00 (16.00-48.00)		56.00 (38.00-74.00)	
	Cancer	49.00 (39.00-49.00)		52.00 (52.00-83.00)	
	Other (psychiatric etc.)	42.00 (37.50-45.50)		65.00 (50.00-69.50)	
Perceived health	Bad	44.00 (39.00-48.00)	0.114; 0.944 ^b	80.00 (67.00-83.00)	14.308; 0.004 ^b
	Moderate	43.00 (38.00-49.75)		59.00 (48.00-71.00)	
	Good	43.00 (33.00-49.00)		70.00 (47.50-78.00)	
Hospitalization	Yes	47.00 (41.00-47.00)	1968.00; 0.904 ^a	75.00 (49.25-81.25)	2159.00; 0.415 ^a
	No	43.00 (38.00-49.00)		65.00 (48.00-78.00)	

CORPD: COVID-19 Related Psychological Distress Scale, PACIC: Patient Assessment of Chronic Illness Care, ^aMann-Whitney U test, ^bKruskal-Wallis test

Table 4. The Spearman's correlations between CORPD and PACIC total and sub-scales

Scales and sub-scales	1	2	3	4	5	6	7	8
1. CORPD total	1							
2. Anxiety and fear	0.852*	1						
3. Suspicion	0.945*	0.687*	1					
4. PACIC total	0.062	-0.033	0.107	1				
5. Patient activation	0.184*	0.110	0.181*	0.769*	1			
6. Delivery system design	0.014	-0.036	0.020	0.796*	0.621*	1		
7. Goal setting	-0.027	-0.097	0.028	0.905*	0.605*	0.789*	1	
8. Problem solving	0.096	0.000	0.167*	0.905*	0.651*	0.632*	0.778*	1
9. Follow-up/coordination	0.095	-0.035	0.142*	0.879*	0.577*	0.579*	0.713*	0.790*

*p<0.05, PACIC: Patient Assessment of Chronic Illness Care, CORPD: COVID-19 Related Psychological Distress Scale

Table 5. The Spearman's correlations between age and CORPD and PACIC total

Age		
Scales	r	p
CORPD total	0.201	0.002
PACIC total	0.040	0.543

CORPD: COVID-19 Related Psychological Distress Scale, PACIC: Patient Assessment of Chronic Illness Care

diseases had lower quality of life and higher levels of anxiety than those without chronic diseases. A meta-analysis of 288,830 participants from 19 countries showed that having mental or physical disorders was associated with a higher prevalence of anxiety and depression in era of the pandemic (21). Considering the one out of every three people experienced psychological stress in era of the pandemic, this study examined the disease management and psychological stress levels of those with chronic diseases during the pandemic (21,22).

In our study, the participants' levels of psychological stress associated with COVID-19 were moderate. The CORPD scores significantly differed by age, gender, education, perceived income, and chronic disease in the study. Older and female participants with high school degrees, low-income perception, and cardiovascular diseases had significantly higher COVID-related psychological stress levels. Gómez-Salgado et al. (23) and Horesh et al. (20) found that people of lower middle age had higher psychological stress levels in the era of COVID-19. Qiu et al. (24) determined that elders had higher psychological stress than children. COVID-19 is having a greater impact on people with chronic illness. Shevlin et al. (25) found that anxiety and depression were also predicted by low income, and pre-existing health conditions in self and others, and specific anxiety about COVID-19 was greater in older participants. Older people with chronic illness are thought to have more psychological stress for three reasons: First, they are more affected by the physiological effects of COVID-19, resulting in increased mortality. Second, they experience more fear in the era of the pandemic because they have chronic diseases. Third, they are bombarded by bad news about COVID-19 on social media platforms (20,23,24). Similar to other studies female participants had significantly

higher CORPD scores than males in this study (24,26,27). It is considered that females are more affected in the post-pandemic period in terms of doing most household chores and being pushed out of the workforce, and it is resulting in higher levels of psychological stress. Studies have emphasized that there is a relationship between education levels and anxiety levels during the pandemic period (28-30). Fornili et al. (28) reported a negative correlation between psychological stress and education. However, Salari et al. (29) found that during the COVID-19 pandemic, people with higher levels of education had greater levels of anxiety and stress. Our study found that participants who were high school graduates had higher CORPD scores than participants who were primary school graduates. It is thought that this result may be because highly educated people search for excessive information on social networks and follow the news of the pandemic more closely, resulting in more fear, helplessness, anxiety, and stress. The CORPD scores significantly differed by economic status in the study. Participants with a badly perceived income had higher CORPD scores and psychological stress than those with a good income. Breslau et al. (31) stated that people who were vulnerable to the economic effects of the pandemic should be regarded as a high-risk group for psychological stress. Agberotimi et al. (32) stated that the socioeconomic status of individuals during the pandemic period had serious effects on their mental well-being. Fornili et al. (28) detected a negative correlation between income and psychological stress. In this case, it can be said that the data are similar to the literature. Among patients with COVID-19, there is a high prevalence of cardiovascular disease (33). Participants with cardiovascular diseases had a significantly higher CORPD score. Similarly, McLachlan and Gale (34) reported that high psychological stress exacerbated cardiovascular diseases. Lim, Lim et al. (35) determined that the pandemic made people with cardiovascular diseases more vulnerable to mental problems.

The participants' levels of disease management were moderate in this study. The participants with high school degrees, with a low-income, with a bad health perception, and male participants had a significantly higher mean PACIC score. It was seen that similar results were obtained in other studies evaluating chronic disease management. In the study of Ballering et al. (36), although there was no difference in the prevalence of chronic diseases between

the genders, it was reported that the risk of chronic disease and the burden of somatic symptoms was higher in women. Hazazi and Wilson (37) found that there was no difference in terms of PACIC score between the genders, while scale scores were higher in those with higher education and income. Another study stated that the evaluation of chronic disease care decreased as the quality of life, perception of care and social status got worse (38). It was also stated that PACIC scores were significantly higher in males and patients with high school or higher education due to their socioeconomic advantage (39). When comparisons between diseases were examined, participants with chronic respiratory disease (asthma, COPD, etc.) had a lower PACIC score than those with cardiovascular disease. Patients with chronic respiratory were considered as vulnerable group during the pandemic, and they had difficulty in accessing healthcare services, medications, and medical devices. These patients need additional supportive care and intensive care support, and they are also at high risk of COVID-19 because of the nebulizers use. All these situations cause them to face serious COVID-19 symptoms and mortality risks when effective disease management is not provided (2,13,40,41). Therefore, it was not surprising that patients with respiratory diseases had more difficulty managing their chronic condition.

When the correlations between CORPD and PACIC total and subscale scores were examined, psychological stress and suspicion increased active participation in care; suspicion also increased problem solving and follow-up/coordination. Research results showed that moderate psychological stress and suspicion had a positive and stimulating effect on patients' chronic disease management. It is reported that until the optimum level is reached, stress can be beneficial and cause positive reactions. In addition, it is stated that the adaptation response to stress may lead to negative health outcomes but may have protective effects against another health problem on the other hand (42). It has also been reported that short-term stress has positive effects on the immune system and improving health (43). In this direction, the positive effect of moderate stress on chronic disease management was supported by the literature in this study, which evaluated the relevant population in a short period of time.

Study Limitations

This cross-sectional study was carried out using social networks from people who could be reached within a certain date range. The fact that the data were collected during the period when COVID-19 was not very widespread, the snowball sampling method used, and the majority of the participants being women, constituted limitations in terms of the generalizability of the results to the whole population. The strength of our study was that the scales of which validity and reliability studies were previously performed in Turkey were used in the study.

Conclusion

Healthcare professionals should recognize that poorly managed chronic diseases have long-term adverse effects. For this reason, it is emphasized that it is necessary to focus on patients with

chronic diseases, especially in this period. It is necessary to develop a systematic framework for defining the mental effects of the pandemic in patients with chronic illness. Accordingly, in this study, psychological stress, and disease management in individuals with chronic disease were at moderate levels. Although psychological stress negatively affected people's physical well-being, social relations, and economic status in era of the pandemic, it was found that moderate stress levels positively affected chronic disease management in this study. It is recommended to develop a systematic framework for defining the mental effects of the pandemic in patients with chronic illness. It is recommended to evaluate the long-term effects of psychological stress, and its impact on chronic disease management in further research.

Ethics

Ethics Committee Approval: The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The scientific research ethics committee approval was obtained (no: 09/17, date: 12.04.2021).

Peer-review: Externally peer reviewed.

Authorship Contributions

Surgical and Medical Practices: K.İ., N.A.S., Concept: K.İ., N.A.S., Design: K.İ., N.A.S., Data Collection or Processing: K.İ., N.A.S., Analysis or Interpretation: K.İ., N.A.S., Literature Search: K.İ., N.A.S., Writing: K.İ., N.A.S.

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