Anxiety, Insomnia and Pandemic Awareness of Cancer Patients Receiving Chemotherapy During the COVID-19 Pandemic Period

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ABSTRACT

The emergence of COVID-19 pandemic caused a global public health problem. In this article, anxiety and insomnia rates of cancer patients who received chemotherapy during COVID-19 outbreak period were determined. In addition, patients' information and opinions about COVID-19 were discussed. The study included 218 cancer patients who apply to outpatient chemotherapy clinic between May-June 2020, aged 18 and over, who were receiving chemotherapy. Generalized Anxiety Disorder and Insomnia Severity Index questionnaire forms were given to fill the patients to evaluate their anxiety and insomnia levels. We also prepared 12 additional questions about the knowledge and perceptions of COVID-19. Seventy eight (35.8%) patients had anxiety and 106 (48.6%) had insomnia. The rate of whole patients with severe anxiety was 1.8% and with severe insomnia was 2.8%. There was a statistically significant relationship between tumor localization and anxiety (p=0.006). Anxiety scores also increased with the increase in insomnia scores (p< 0.001). Eighty three percent of our patients wore face masks in any environment where they were in contact with people, and 84.9% believed in the protection of the face mask. To the authors' knowledge, this is the first study to examine the anxiety and insomnia rates of the cancer patients receiving chemotherapy in COVID-19 pandemic. The uncertainty of the COVID-19 pandemic process can further increase anxiety and insomnia rates. Patients should be evaluated psychosocially both in the pandemic process and after. Correcting these misperception should be targe-ted in information campaigns, information by clinicians to their patients, and media coverage.

Keywords: Anxiety, Insomnia, Cancer, Chemotherapy, COVID-19 awareness

INTRODUCTION

At the end of 2019, a new coronavirus pneumonia was identified in Wuhan, China. In Turkey, the first coronavirus 2019 (COVID-19 or SARS-CoV-2) case was reported on March 10, 2020. The emergence of COVID-19 caused a global public health problem. Cancer patients are more susceptible to infection than people without cancer because malignancy and anticancer therapy can cause an immunosuppressive condition.[1] In 2009 during the influenza A (H1N1) virus outbreak, cancer patients had higher pneumonia and mortality rates compared to the general population.[2] In the current pandemic period, cancer patients were shown to be worse affected by COVID-19 infection than individuals without cancer.[1]

Pandemic periods can cause psychosocial disorders such as anxiety, depression and insomnia, or exacerbate the existing condition, or even impair quality of life, in cancer patients especially receiving chemotherapy treatment, which creates an immunosuppressive condition.[1]

Psychiatric illnesses such as anxiety and insomnia are common, but often neglected, complications of cancer, influencing quality of life, adherence to treatment, cancer survival and treatment costs.[3] They are mostly caused by the patient's psychological responses to diagnosis, treatment, relapse, end-of-life care or survival in cancer.[4]

In this article, anxiety and insomnia rates of cancer patients who received chemotherapy during COVID-19 outbreak period were determined. In addition, patients' information and opinions about COVID-19 were discussed.

PATIENTS AND METHODS

The study included 218 cancer patients who apply to outpatient chemotherapy clinic between May-June 2020, aged 18 and over who were receiving chemotherapy. Diagnoses and metastasis status of patients were recorded from patients' files. Eastern Coope rative Oncology Group Performance Status (ECOG-PS) of the patients was evaluated and noted. Generalized Anxiety Disorder (GAD)-7 and Insomnia Severity Index (ISI) questionnaire forms were given to fill the patients to evaluate their anxiety and insomnia levels. We also prepared 12 additional questions about the knowledge and perceptions of COVID-19, inspired by the questionnaire, specific questions about "myths" or falsehoods listed on the World Health Organization's "myth busters" website.[5,6] We asked the patients to answer these 12 questions. This study was approved by institutional ethics committee of Ankara City Hospital with decision number E1/640/2020.

Generalized Anxiety Disorder Questionnaire:

Spitzer et al. developed the 7-item GAD-7 Scale based on the GAD criteria found in the DSM-5. The GAD-7 score is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of 'not at all', 'several days', 'more than half the days', and 'nearly every day', respectively, and adding together the scores for the seven questions. Scores of 5, 10, and 15 are taken as the cut-off points for mild, moderate and severe anxiety, respectively.[7] The Turkish GAD-7 has been validated by Konkan et al.[8]

Insomnia Severity Index Questionnaire:

Insomnia Severity Index is developed to evaluate insomnia severity and whose validity and reliability were made by Boysan et al.[9] Scale items consisting of seven questions are scored between 0-4. The scores that can be obtained from the scale vary between 0-28. Scores of 8, 15, and 22 are taken as the cut-off points for mild, moderate and severe insomnia, respectively The characteristics of the items that the scale measures are: i) difficulties in going to sleep, ii) difficulties in maintaining sleep, iii) very early awakening, iv) satisfaction from the sleep pattern, v) impairments in daily functionality, vi) the noticeability of sleep-related disorders and vii) the level of stress caused by sleep problems.

Statistical Analysis

Statistical analysis was performed by using Statistical Package for the Social Sciences Version 22.0 for Windows (SPSS Inc., Chicago, IL, USA). The comparisons of groups and subgroups were performed by Z test for categorical variables. Continuous variables reported as median and noncontinous variables reported as percentage. Baseline features of groups were analyzed by descriptive statistical methods. We reported two-sided p-values, and a p-value < 0.05 considered as statistically significant.

RESULTS

The mean age of the patients was 52.89 + 14.72 years. Ninety three patients (42.7%) were female and 125 patients (57.3%) were male. Thirty three patients (15.1%) had lung cancer, 64 patients (29.4%) gastrointestinal system cancer, 35 patients (16.1%) breast cancer, 36 patients (16.5%) genitourinary system cancer and 50 patients (22.9%) had other cancers (lymphoma, myeloma and head-neck tumors). Metastatic patients were 59.2%. 78 (35.8%) patients had anxiety and 106 (48.6%) had insomnia. The rate of whole patients with severe anxiety was 1.8% and with severe insomnia was 2.8%. There was mild anxiety in 25.8% of women, moderate anxiety in 14% and severe anxiety in 3.2%. There was mild anxiety in 16.8% of men, moderate anxiety in 12.8% and severe anxiety in 0.8%. Sociodemographic characteristics of the patients are shown in Table 1.

Table 1. Sociodemographic characteristics of patients

		n (%)
Age (years)	< 65	167 (76.6%)
	≥ 65	51 (23.4%)
Sex	Female	93 (42.7%)
	Male	125 (57.3%)
Diagnosis	Lung cancer	33 (15.1%)
	Gastrointestinal system cancer	64 (29.4%)
	Breast cancer	35 (16.1%)
	Genitourinary system cancer	36 (16.5%)
	Other cancers	50 (22.9%)
Metastasis	Yes	129 (59.2%)
	No	89 (40.8%)
Education status	Illiterate	10 (4.1%)
	Primary education	106 (48.8%)
	High school	58 (26.7%)
	University	44 (20.3%)
ECOG-PS	0	44 (20.2%)
	1	134 (61.5%)
	2	40 (18.3%)
Generalized Anxiety Disorder	< 5 (normal)	140 (64.2%)
	≥ 5 (anxiety)	78 (35.8%)
Insomnia	≤ 7 (normal)	112 (51.4%)
	≥ 8 (insomnia)	106 (48.6%)

ECOG-PS: Eastern Cooperative Oncology Group Performance Status

Generalized anxiety disorder status of the patients were given in Table 2. There was no age difference between anxiety groups (p= 0.228). There was no difference between sex groups, metastasis status, ECOG-PS and educational status in terms of without anxiety, mild anxiety, moderate anxiety and severe anxiety (p= 0.159, p= 0.724, p= 0.546, p= 0.141 respectively). We found the anxiety rates as 42.4% (n= 14) in lung cancer, 32.8% (n= 21) in gastrointestinal cancers, 62.8% (n= 22) in breast cancer and 27.7% (n= 10) in geniturinary cancers. There was a statistically significant relationship between tumor localization and anxiety (p= 0.006). In subgroup analyzes, the rate of severe anxiety was statistically higher in patients diagnosed with lung cancer than those with GIS cancer.

Patients with lung cancer diagnosis had a higher rate of mild anxiety than with patients with breast cancer. The rate of patients without anxiety was lowest in the lung cancer group. The proportion of patients without anxiety was statistically significantly higher in GIS cancer patients and GUS cancer patients than breast cancer. The rate of mild anxiety in breast cancer is higher than in GUS cancers. Those with mild anxiety in breast cancer was 40% (n= 14) and those without anxiety was 37.1% (n= 13). This was found statistically significant (p< 0.0001). There was a statistically significant difference between those without anxiety group (n=13, 37.1%) and those with severe anxiety (n= 2, 5.7%) in breast cancer (p= 0.009). There was a statistically significant difference between those without anxiety (n= 19, 57.5%) and those with mild anxiety (n= 5, 0.1%) in lung cancer (p= 0.009). Similarly, there was a significant difference between those with severe anxiety (n= 2, 0.06%) and those with mild anxiety (n= 5, 0.1%) in this group (p= 0.033). There was also a statistically significant difference between those without anxiety (n= 39, 78%) and those with mild anxiety (n= 6, 12%) in the other cancer types group (p= 0.048). We found the insomnia rates as 57.5% (n= 19) in lung cancer, 50% (n= 32) in gastrointestinal cancers, 60% (n= 21) in breast cancer and 44.4% (n= 16) in geniturinary cancers. Anxiety scores also increased with the increase in insomnia scores and it was statistically significant (p< 0.001). We could not detect any difference between age, sex groups, metastasis status, ECOG-PS, educational status and tumor localization in terms of mild, moderate and severe insomnia. (Table 3)

In the survey on patients' knowledge and perceptions about COVID-19 (Table 4), 72% of the patients answered "How many percent of people infected with COVID-19 die from this infection?" as < 20%. Sixty seven point four percent of patients were concerned that around 1001-10000 people would die because of COVID-19 by the end of 2020. Ninety six point three percent of patients thought COVID-19 could kill the most elderly population. While 79.4% of patients was considering that less than 20% of Turkey's population were thought to be virus carriers. 6% of patients believed that there was a vaccine developed against

Table 2. Generalized anxiety disorder status of the patients

	< 5 (normal)	5-9 (mild anxiety)	10-14 (moderate anxiety)	≥ 15 (severe anxiety)	P value
Mean Age (years)	57.5 (19-84)	51 (18-94)	59 (28-78)	46.5 (37-56)	0.228
Sex					
Female	53 (38%)	24 (53%)	13 (45%)	3 (75%)	0.159
Male	87 (62%)	21 (47%)	16 (55%)	1 (25%)	
Metastasis					
Yes	83 (59%)	29 (64%)	15 (52%)	2 (50%)	0.724
No	57 (41%)	16 (36%)	14 (48%)	2 (50%)	
ECOG-PS					
0	33 (24%)	8 (18%)	3 (10%)	0 (0%)	0.546
1	86 (61%)	28 (62%)	17 (59%)	3 (75%)	
2	21(15%)	9(20%)	9 (31%)	1(25%)	
Education status					
Illiterate	6 (4%)	2 (4%)	1 (3%)	0 (0%)	0.141
Primary school	59 (42%)	24 (53%)	20 (69%)	3 (75%)	
High school	40 (29%)	9 (20%)	8 (28%)	1 (25%)	
University	34 (25%)	10 (23%)	0 (0%)	0 (0%)	
Insomnia categorical					
0-7 (normal)	89 (64%)	18 (40%)	5 (17%)	0 (0%)	< 0.001*
8-14 (mild insomnia)	41 (29%)	22 (49%)	13 (45%)	2 (50%)	
15-21 (moderate insomnia)	7 (5%)	5 (11%)	9 (31%)	1 (25%)	
22-28 (severe insomnia)	3 (2%)	0 (0%)	2 (7%)	1 (25%)	
Tumor location					
Lung cancer	19 (14%)	5 (11%)	7 (24%)	2 (50%)	< 0.006*
Gastrointestinal system cancer	43 (31%)	15 (33%)	6 (21%)	0 (0%)	
Breast cancer	13 (9%)	14 (31%)	6 (21%)	2 (50%)	
Genitourinary system cancer	26 (19%)	5 (11%)	5 (17%)	0 (0%)	
Other cancers	39 (28%)	6 (13%)	5 (17%)	0 (0%)	

COVID-19. While the rate of patients wearing a face mask in any place was 83%, the ratio of those who does not wear a face mask was 2.8%. 84.9% of patients thought that wearing a face mask constantly prevents them from becoming infected with COVID-19. To transmit from one person to another, 75.2% of patients thought that COVID-19 could go ≤ 5 meters in the air, and 18.3% of patients thought that COVID-19 could go 6-10 meters. Nasal bleeding according to 3.7% of patients, cough according to 93.1%, fever according to 95.9%, skin rash according to 13.3%, constipation according to 11.9%, shortness of breath according to 94.5%, frequent urination according to 6.4% were symptoms and signs of COVID-19. Fifty six point nine percent of patients thought that COVID-19 could be an improved bio-weapon.

DISCUSSION

COVID-19 has produced psychological and social consequences that may affect mental health not only in the pandemic period, but also in the future.[10] Quarantine results include acute stress disorders, anxiety, post-traumatic stress disorders, depressive symptoms, and insomnia.[11] In the society anxiety and sleep disturbances prevalences were found to be 23.2% and 42.2% respectively, in the COVID-19 pandemic period.[12] In this study, we found the anxiety rates as 42.4% in lung cancer, 32.8% in gastrointestinal cancers, 62.8% in breast cancer and 27.7% in geniturinary cancers. We also found the insomnia rates as 57.5% in lung cancer, 50% in gastrointestinal cancers, 60% in breast cancer and 44.4% in geniturinary cancers.

Table 3. Insomnia status of the patients

	≤ 7 (normal)	8-14 (mild insomnia)	15-21 (moderate insomnia)	22-28 (severe insomnia)	P value
Mean Age (years)	51.5 (18-84)	58 (22-94)	58.5 (27-76)	51.5 (34-66)	0.096
Sex					
Female	43 (38%)	36 (46%)	11 (50%)	3 (50%)	0.606
Male	69 (6%)	42 (54%)	11 (50%)	3 (50%)	
Metastasis					
Yes	64 (57%)	50 (64%)	12 (55%)	3 (50%)	0.710
No	48 (43%)	28 (36%)	10 (45%)	3 (50%)	
ECOG-PS					
0	25 (22%)	17 (22%)	1 (5%)	1 (17%)	0.129
1	73 (65%)	43 (55%)	13 (59%)	5 (83%)	
2	14 (13%)	18 (23%)	8 (36%)	0 (0%)	
Education status					
Illiterate	5 (5%)	4 (5%)	0 (0%)	0 (0%)	0.713
Primary school	47 (42%)	44 (56%)	12 (57%)	3 (50%)	
High school	35 (31%)	16 (21%)	5 (24%)	2 (33%)	
University	25 (22%)	14 (18%)	4 (19%)	1 (17%)	
Tumor location					
Lung cancer	14 (13%)	12 (15%)	6 (27%)	1 (17%)	0.710
Gastrointestinal system cancer	32 (29%)	25 (32%)	5 (23%)	2 (33%)	
Breast cancer	14 (13%)	16 (21%)	4 (18%)	1 (17%)	
Genitourinary system cancer	20 (18%)	11 (14%)	4 (18%)	1 (17%)	
Other cancers	32 (27%)	14 (18%)	3 (14%)	1 (17%)	

To the authors' knowledge, this is the first study to examine the anxiety and insomnia rates of the cancer patients receiving chemotherapy in COVID-19 pandemic. On the other hand, the differences in previous anxiety and insomnia studies conducted in patients with cancer may be attributed to different types of questionnaires used, different ethnicity, different number of patients, and the inclusion of patients with different cancer types.

Anxiety and insomnia affect up to 10%[13] and 19-63% of patients with cancer respectively.[14,15] In our study, the anxiety rate in cancer patients was 35.8%, and the insomnia rate was 48.6%. In the light of this data, while the insomnia rate was found to be similar or higher than the results of the previous studies, the anxiety rate was found to be quite high during the COVID-19 pandemic period. Limited data are available to examine the effect of pandemics on cancer patients receiving chemotherapy. In the pandemic period some patients may prefer not

to apply to the hospitals with concern of meeting with asymptomatic COVID-19 positive patients.[16] In a study conducted in Wuhan, China, the rate of asymptomatic carrier was found to be 33.3%.[17] In another study conducted in Japan, this rate was found to be around 17.9%.[18] New patients may have concerns about the delay in their treatment and what would be the probable negative conclusions on their treatment and survival outcomes.[19] All these causes may increase anxiety and insomnia rates in cancer patients receiving chemotherapy. In this study, it can be said that anxiety rates were higher in lung cancer patients and breast cancer patients, respectively, compared to other groups. The high probability of breast cancer patients receiving radiotherapy in adjuvant therapy, the patients being followed up with hormonotherapy for a long time, and the trauma they experienced due to organ loss after mastectomy may increase the rate of anxiety in these patients. Dyspnea experienced by most patients in lung cancer may cause poor quality of life,

Table 4. Knowledge and perceptions of COVID-19 among the cancer patients

How many percent of people infected with COVID-19 die from this infection?	< 20%		157 (72%)
	21-40%		22 (10.1%)
	41-60%		21 (9.6%)
	61-80%		11 (5%)
	81-100%		7 (3.2%)
The current population of Turkey is approximately 83 million people. How many people do you think will die from COVID-19 by the end of 2020?	1001-10000 people		147 (67.4%)
	10001-100000 people		49 (22.5%)
	100001-1 million people		13 (6%)
	1000001-10 million people		9 (4.1%)
When infected with COVID-19, which age group is more likely to die from the disease?	Children		4 (1.8%)
	Youth		4 (1.8%)
	Elders		210 (96.3%)
People with health problems are more likely to die from COVID-19 infection than those without.	Yes		200 (91.7%)
	No		18 (8.3%)
How many percent of the total population carry viruses in Turkey? (diagnosed or undiagnosed)	< 20%		173 (79.4%)
	21-40%		25 (11.5%)
	41-60%		11 (5%)
	61-80%		9 (4.1%)
	81-100%		0 (0%)
Is there a vaccine developed against COVID-19?	Yes		13 (6%)
	No		205 (94%)
Which one is protective against COVID-19?	Wearing a face mask	True	212 (97.2%)
		False	6 (2.8%)
	Pneumonia vaccine	True	116 (53.2%)
		False	102 (46.8%)
	Mouthwash	True	146 (67%)
		False	72 (33%)
	Washing hands	True	211 (96.8%)
		False	7 (3.2%)
	Avoiding close contact with sick people	True	210 (96.3%)
		False	8 (3.7%)
	Taking antibiotics	True	38 (17.4%)
		False	180 (82.6%)
	Avoiding touching hands your eyes, hands, and mouth witth unwashed hands	True	202 (92.7%)
		False	16 (7.3%)
Do you wear a face mask?	No		6 (2.8%)
	Only in hospital		11 (5%)
	Only in crowded places		20 (9.2%)
	In any place that I contact people		181 (83%)
Wearing a face mask constantly prevents you from becoming infected with COVID-19	Yes		185 (%84.9)
	No		33 (15.1%)
How many meters do you think it can go in the air so that COVID-19 can be transmitted from one person to another?	≤ 5 meters		164 (75.2%)
	6-10 meters		40 (18.3%)
	11-16 meters		3 (1.4%)
	17-20 meters		11 (5%)
What are the common symptoms and signs of COVID-19?	Nose bleeding	True	8 (3.7%)
		False	210 (96.3%)
	Cough	True	203 (93.1%)
		False	15 (6.9%)
	Fever	True	209 (95.9%)
		False	9 (4.1%)
	Skin rash	True	29 (13.3%)
		False	189 (86.7%)
	Constipation	True	26 (11.9%)
		False	192 (88.1%)
	Shortness of breath	True	206 (94.5%)
		False	12 (5.5%)
	Frequent urination	True	14 (6.4%)
		False	204 (93.6%)
Do you think COVID-19 could be an improved bio-weapon?	Yes		124 (56.9%)
	No		94 (43.1%)

sleep disturbances and fear of death, increasing the rate of anxiety in these patients compared to other cancers.[20]

Tumors have been associated with psychosocial stresses such as anxiety and insomnia.[21,22] Stress occurs as a result of interactions between the nervous, endocrine and immune systems, and secreted interleukin (IL) 1, IL-2, IL-6, IL-8, tumour necrosis factor-alpha (TNF-α) and IL-10 mediate this condition.[22,23] In a study, IL-2 was found to mediate the association between sleep and survival in patients with advanced cancer.[24] Anxiety may be the first sign of cancer for tumors that have direct biological-mediated effects on mood.[25] The incidence of cancer diagnosis in the first month after an initial psychiatric presentation for anxiety is three times higher than the rest of the population and is particularly high in people over 65.[25] There are two main ways depression and anxiety can occur in patients with cancer: the processes in the biopsychosocial model (biological, psychological and social factors), and the neuropsychiatric effects of cancer treatments and certain cancers.[26] There is no exact estimate for the rate of anxiety cases attributable to the direct biological effects of specific tumors or cancer treatments.[26] In another study, men receiving androgen deprivation therapy for prostate cancer reported statistically significantly higher anxiety rates from baseline over nine months of treatment.[27] Up to 50% of women with breast cancer have an anxiety diagnosis that develops in the year after diagnosis and drops to 15% within five years.[28] Even in cancer patients in remission, the prevalence of anxiety (18%) is significantly higher than in healthy controls and lasts up to 10 years.[29]

Cancer patients may experience insomnia due to stress associated with diagnosis and treatment, chemotherapy prodrugs, direct effects of chemotherapy, decreased physical activity, and direct effects of tumor biology itself. It can be associated with many side effects such as cancer-related fatigue, depression, increased pain, poor quality of life, and possibly disease progression and survival.[30] Insufficient or poor quality sleep is the most common complaint in cancer people with insomnia.[31] In about 60% of cancer patients, insomnia persists throughout the treatment period and throughout the survival phase.[32] Previous study has demonstrated that bad subjective sleep is associated with poor overall survival in patients with gastrointestinal carcinoma.[33] In another study showed that sleep disorders led to an increase in all-cause deaths in breast cancer.[34]

Unlike in the general population, anxiety in cancer is not associated with age, gender, or socioeconomic status.[3] Only for some types of cancer, anxiety is associated with metastatic disease.[35] In this study, we could not find any difference in anxiety and insomnia scores according to age, gender, metastasis status, and educational status. A study showed that patients receiving chemotherapy experienced more severe levels of insomnia than patients receiving other treatments such as surgery, radiation, or hormonal therapy.[32] Side effects of chemotherapy such as hair loss, nausea and vomiting may cause more anxiety in patients receiving chemotherapy.

People's behaviors can be influenced by their knowledge and perceptions. In our study, 96.3% of patients thought the older group was more likely to die from the disease when infected with COVID-19. Ninety one point seven percent of patients thought that people with health problems were more likely to die from COVID-19 infection. Individuals of any age can acquire COVID-19 infection, although older adults are most commonly affected, and older adults are more likely to have severe disease. Older age is also associated with increased mortality.[36] Eighty three percent of our patients wore face masks in any environment where they were in contact with people, and only 84.9% believed in the protection of the face mask. Whereas, the WHO recommends mask-wearing as part of a comprehensive to reduce COVID-19 transmission in settings where there is widespread transmission and social distancing is difficult.[37] 6% of our patients thought that there was a vaccine developed against COVID-19. Numerous vaccine candidates are being evaluated for prevention of COVID-19.[38] However, there is still no routine vaccine. Seventy-five point percent of our patients thought that COVID-19 can go $\leq$ 5 meters in the air so that it can be transmitted from one person to another. Previos studies using specialized imaging to visualize respiratory exhalations have suggested that respiratory droplets may get aerosolized or carried in a gas cloud and have horizontal trajec-

tories beyond two meters with speaking, coughing, or sneezing.39 During the COVID-19 pandemic, cancer patients with suppressed immune system may be more anxious about getting the disease compared to the healthy population. Since these patients who receive chemotherapy are in closer contact with their physicians and healthcare professionals, the level of awareness of COVID-19 may be higher than the society. Therefore, they may be following the protective measures more closely. Interestingly 56.9% of patients thought this virus was a biological weapon.

This study had some limitations. Gastrointestinal cancers, genitourinary cancers and other groups could not be divided into subtypes due to the low number of patients and were evaluated under the general title. Another limitation was that chemotherapy side effects were not evaluated in these patients.

Conclusion

The uncertainty of the COVID-19 pandemic process can further increase anxiety and insomnia rates. It may make it difficult for cancer patients, especially those receiving chemotherapy treatment, to continue and adapt to treatment. Besides this the general public in Turkey appears to have misconceptions about COVID-19. Correcting these misperception should be targeted in information campaigns, information by clinicians to their patients, and media coverage.

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