ANXIETY AND DEPRESSION AMONG PEOPLE LIVING WITH HIV DURING THE COVID-19 PANDEMIC: A FACE-TO-FACE SURVEY FROM TURKEY

Pınar Ergen[1], Aynur Görmez[2], Handan Ankaralı[3], Özlem Aydın[1], Naciye Betül Baysal[1] & Yasemin Çağ[4]

[1]*Department of Infectious Diseases and Clinical Microbiology , Istanbul Medeniyet University Göztepe Training and Research Hospital, Istanbul, Turkey*
[2]*Department of Psychiatry, Istanbul Medeniyet University Faculty of Medicine, Istanbul, Turkey*
[3]*Department of Biostatistics and Medical Informatics, Istanbul Medeniyet University Faculty of Medicine, Istanbul, Turkey*
[4]*Department of Infectious Diseases and Clinical Microbiology, Istanbul Medeniyet University Faculty of Medicine, Istanbul, Turkey*

SUMMARY

Background: During the COVID-19 pandemic, there have been some difficulties in the routine care of people living with HIV (PLWH).

Subjects and methods: We aimed to evaluate the impact of COVID-19 on mental health of PLWH and their use of health services. This study was conducted using the face-to-face interview method in the outpatient clinic of a university hospital, between 01.09.2020 and 30.11.2020. Hospital Anxiety and Depression Scale and survey instrument designed by the researchers investigating socio-demographic data and access to health services were used.

Results: The study included 217 patients, 91.7% (n=199) of whom were male. All of the patients were postponed their hospital appointments, 60.8% were concerned about not being able to contact their physician and 53% had concerned about being stigmatized if they went to the hospital. Of the participants, 27.6% had depression, 12.9% had anxiety and 8.3% had both depression and anxiety. Low income, job loss, and fear of being stigmatized were associated with depression and anxiety. Lower level of education, discontinuation of medications and lack of opportunity to work remotely were associated with depression, while history of psychiatric illness, worry about not being able to contact their physician and cessation of antiretroviral therapy were associated with higher anxiety levels.

Conclusion: It is important to develop strategies ensuring the continuity of care for PWLH and identify and support those with a higher mental health impact.

Key words: HIV - COVID-19 - depression - anxiety

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INTRODUCTION

Coronavirus, which caused serious infections such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) at the beginning of the 21st century, has now emerged with another serious clinical picture (Cui et al. 2019). On 31.12.2019, patients with pneumonia characterized by severe acute respiratory symptoms were reported in Wuhan city, Hubei province, China. The novel disease, named Coronavirus Disease 2019 (COVID-19) by the World Health Organization (WHO), has caused a great wave of panic around the world (Huang et al. 2020). While trying to protect against COVID-19, the society had to cope with deaths, loneliness, and disruptions in education, economic shrinkage, and unemployment on the other hand. The question, "What We Must Do to Prevent a Global COVID-19 Depression", which attracted the attention of Shader, has become a problem that we all try to answer (Shader 2020, World Economic Forum 2020).

COVID-19 has affected different frontiers of lives and induced many mental problems such as panic, anxiety, depression, post-traumatic stress disorders, suspiciousness, stigma, xenophobia, racisms, etc. (Jakovljevic et al. 2020a). In a survey conducted in Bosnia and Herzegovina, 28.4% of the participants reported symptoms of depression, while in a Kosovo study, 35.6% of participants reported moderate to severe depression symptoms (Šljivo et al. 2020, Fanaj & Mustafa 2020).

Studies show that the mental health of healthcare professionals and other individuals in the society has been negatively affected by this pandemic period (Talevi et al. 2020, Cag et al. 2021, Park & Park 2020, Usul et al. 2020, Elbay et al. 2020). Curfews, the obligation to work from home, and restrictions on social life have caused anxiety around the world, especially the elderly and those with chronic diseases and immunedeficiency were the most affected groups.

Mental health problems have been reported frequently in people living with HIV (Human Immunodeficiency Virus) (PLWH). In addition, depression was

found to be the most common psychiatric comorbidity after substance use (Rabkin 2008). Similarly, many studies have shown that the incidence of anxiety is higher in PLWH than in the general population (Kemppainen et al. 2013, Bing et al. 2001, Robertson et al. 2014).

The first COVID-19 case in Turkey was detected on 11.03.2020 (First Case, Republic of Turkey Ministry COVID-19 information page 2020).The health system in our country, which has been very fast and well-coordinated since the beginning of the pandemic period, is still working with the same self-sacrifice but, despite all kinds of precautions, COVID-19 and related deaths still continue, contrary to what was hoped (Demirbilek et al. 2020, Republic of Turkey Ministry COVID-19 information page 2021). In crisis and adversities some systems, persons or communities are fragile and breakdown under pressure, while others remain resistant, adaptive and resilient, and some even thrive and grow (Jakovljevic et al. 2020b). It is likely that psychological stress among PLWH has been increased, due to the general effect of the pandemic as well as some concerns about the existing diseases of these individuals and the disruption of their routine care. During the COVID-19 pandemic period, a number of problems have been reported regarding the use of health systems and regular follow-up of PLWH (Prabhu et al. 2020). Although some online surveys have been conducted on this subject, there are a limited number of face-to-face studies examining the routine care of PLWH during the pandemic period and its relationship with their anxiety and depression levels.

The aim of this study was to examine the anxiety and depression levels of PLWH during the COVID-19 pandemic period, and their relation with certain socio-demographic variables and utilization of health services. Identifying potential difficulties will serve as a guide for ensuring retention in HIV care and planning for mental health interventions when necessary during this critical period of time.

SUBJECTS AND METHODS

Ethical consent was obtained from the ethic committee of Istanbul Medeniyet University, School of Medicine (2020/0568).

This study was conducted in the outpatient clinic of Infectious Diseases and Clinical Microbiology of Istanbul Medeniyet University, Göztepe Training and Research Hospital, Istanbul, Turkey, between 01.09.2020 and 30.11.2020. Because of the pandemic, infectious diseases outpatient clinic couldn't work actively between 01.04.2020-15.06.2020. The questionnaire was applied to consecutive patients in the period after the polyclinics were reopened. We sequentially invited 232 HIV-positive individuals over the age of 18 years who applied to our outpatient clinic for follow-up to participate in the study. Out of those, 15 patients refused to attend to the questionnaire. The study included 217 patients. The interviews were conducted with the appropriate protective measures. The study was conducted on a voluntary basis, through face-to-face interviews.

The questionnaire consisted of two parts. The first part consisted of 22 questions examining sociodemographic data, including income levels, duration of the HIV disease, the route of HIV transmission, comorbid medical and mental disorders, access to healthcare services and antiretroviral treatments (ART) during the pandemic period, and the knowledge about COVID-19 and the pandemic period. The second part included the Hospital Anxiety and Depression Scale (HADS), which is a Likert-type self-report scale consisting of 14 questions. HADS is a questionnaire developed by Zigmond and Snaith to measure the levels of depression and anxiety in patients with a medical disease, and its validity and reliability study in Turkey was conducted by Aydemir et al. (Zigmond & Snaith 1983, Aydemir et al. 1997). In the Turkish reliability study, the Cronbach's alpha coefficient was 0.8525 for the anxiety subscale and 0.7784 for depression subscale. The cut-off value for the Turkish population was 10/11 for the anxiety subscale and 7/8 for the depression subscale. In our study, depression and anxiety scores were calculated separately. In this study, those who scored 11 from the anxiety subscale and 8 from the depression subscale were included in the risk group. Accordingly, the state of anxiety and depression was scored and classified as "present" and "absent". HADS was found to have been a reliable self-report instrument in assessing depression and anxiety among people with HIV with an excellent internal consistency (Cronbach alpha of 0.89) (Savard et al.1998). It has been used in several previous studies for this purpose in people with HIV (Camara et al. 2020, Been et al. 2019).

In our study, there was a great variation between income levels of patients. Therefore, the income level was classified in 5 groups: *unemployed*, less than 2 500 TL (*low income*), 2 500 – 5 000 TL (*low-medium income*), 5 000 – 10 000 TL (*medium-high income*), and 10 000 TL and above (*high income*). In order to avoid loss of information, age and duration of disease were not grouped and accepted as numerical variables. In addition, since all of the participants answered yes to the question of "During the pandemic period, did you postpone your hospital application although necessary?", its effect on anxiety and depression levels could not be evaluated.

The descriptive values of the data were calculated as mean, standard deviation, median, frequency and percentage. The normality distribution of the data was evaluated with the Kolmogorov-Smirnov test. The independent-samples t-test was used to compare numerical variables between those with and without

anxiety and those with and without depression. In addition, the relationship between numerical variables and anxiety and depression scores was examined using Pearson's correlation analysis. Relationships between categorical variables and the presence of anxiety and depression was analyzed using the Pearson's Chi-Square test. The effects of categorical variables on anxiety and depression scores were evaluated with the one-way ANOVA model, and the reasons for significant differences were also determined with the Turkey's Post-Hoc test. A p value of <0.05 was considered the limit of statistical significance and SPSS Statistics V22.0 was used for statistical analysis. In addition, the combined effects of risk factors on depression score and anxiety score were examined with the multiple ANCOVA model. Variables with P value <0.10 were included in this model as a result of univariate tests.

RESULTS

A total of 217 HIV patients were included in the study. Of the patients, 91.7% (n=199) were male and 8.3% (n=18) were female. Out of males, 84.4% (n=164) were men who have sex with men (MSM). Of the patients, the median age (IQR) was 36 years (30-43.5 years) and the median follow-up time (IQR) was 4 years (2-6 years). Among the participants, 88% (n=191) stated that HIV was transmitted through sexual contact. Of the patients, 24% (n=52) had a chronic medical disease accompanying HIV infection such as diabetes, hypertension, and coronary artery disease, and 6.9% (n=15) had comorbid psychiatric disorders. All of the patients (n=217) postponed their hospital appointments even when necessary, and 60.8% (n=132) were concerned about not being able to access their usual physician, and 53% (n=115) had concerned about being stigmatized if they went to a hospital. Median anxiety score (IQR) was detected as 6 (3-9), and the median depression score (IQR) was detected as 5 (2-8). Table 1 shows the distribution of categorical variables of all participants.

The mean anxiety subscale score was 6.07 (SD: 3.75) and depression score was 5.29 (SD: 3.92). The cut-off values for the depression and anxiety subscales were 8 and 11 points, respectively. Accordingly, 60 of 217 (27.6%) patients had depression, 28 (12.9%) had anxiety, and 18 patients (8.30%) had both depression and anxiety. While there were 42 (19.35%) individuals who only had depression (but not anxiety), there were 10 (4.61%) individuals with only anxiety.

There was no difference in ages of PWLH and duration of disease among those with and without anxiety, and duration of disease among those with and without depression. On the other hand, the mean age was significantly higher in those with depression (p<0.001) (Table 2). Analysis of the correlations between anxiety and depression scores, and age and

duration of disease showed that there was a significant increase in depression scores only with increasing age (r=0.220, p=0.001).

The examination of the total anxiety scores showed that those with low income (p=0.025), those who were concerned about not being able to access their physician (p=0.003), those who were concerned about being stigmatized in case of hospital admission (p=0.002), those who lost their job (p=0.037), those who discontinued their medication (p=0.046) and those with psychiatric disorder (p=0.002) had a significantly higher mean score for anxiety. The examination of the total depression scores showed that those who have middle and lower school graduates (p=0.002), those with low income (p=0.001), those who were concerned about being stigmatized in case of hospital admission (p=0.020), those who lost their job (p=0.035), those who do not work remotely (p=0.003), and those who discontinued their medication (p=0.050) had a significantly higher mean score for depression (Table 3).

The cut-off values of the depression and anxiety scales were determined as 8 and 11 points respectively, and those who scored at and above these limits were grouped as "*having depression*" and "*having anxiety*" respectively. Analysis of the relationships between the presence of anxiety and categorical variables showed that there was a significantly higher incidence of anxiety in low-income individuals, non-MSM individuals, those who had concerns about not being able to access their physician, those who discontinued ART, and those with psychiatric disease (p=0.0001, p=0.015, p=0.004, p=0.016, p=0.014, respectively). Analysis of the relationship between the presence of depression and categorical variables showed that middle and lower school graduates, those with low income, those who do not work remotely during the pandemic period, and those who think the disease will have a more severe course in those infected with HIV had a significantly higher frequency of depression (p=0.002, p=0.001, p=0.003, p=0.008, respectively).

As a result of the univariate tests, the results of the model established by taking into account the variables that have a significant (p<0.05) or suspicious effect (0.05 < p <0.10) on the anxiety score are given in Table 4. Being female, having low-income level than others, concerning about not being able to access their usual doctor, worrying about being stigmatized and having a psychiatric disorder were associated with higher axiety scores.

As a result of univariate tests, the results of the model established by taking into account the variables that have a significant (p<0.05) or suspicious effect (0.05<p<0.10) on depression score are given in Table 4. Being in the low-income group comparing to other income groups and worrying about being stigmatized were associated with higher depression scores. In addition, a significant positive correlation was found between age and depression score.

Table 1. Distribution of all participants according to their categorical data

Variables		*n*	*%*
Gender	Male	199	91.7
	Female	18	8.3
Education Status	Primary school	23	10.6
	Middle School	18	8.3
	High school	39	18.0
	University	137	63.1
Income groups	Unemployed	32	14.7
	Low income	16	7.4
	Low-medium	81	37.3
	Medium-high	66	30.4
	High-income	22	10.1
Route of transmission	Sexually	191	88.0
	Blood-borne	1	0.5
	Other	25	11.5
MSM	No	31	15.6
	Yes	168	84.4
During the pandemic period, did you postpone your follow-up appointment despite necessary?	No	0	0.0
	Yes	217	100.0
Have you ever concerned about not being able to access your usual doctor?	No	85	39.2
	Yes	132	60.8
Did you worry about being stigmatized if you went to hospital for consultation?	No	102	47.0
	Yes	115	53.0
Have you lost your job?	No	157	72.4
	Yes	60	27.6
Did you work remotely?	No	148	68.2
	Yes	69	31.8
Were you alone at home during this period?	No	154	71.0
	Yes	63	29.0
Did you have a break with ART during this period?	No	204	94.0
	Yes	13	6.0
Did you stop the ART during this period?	No	210	96.8
	Yes	7	3.2
Do you have a chronic medical disease?	No	165	76.0
	Yes	52	24.0
Is there any medicine you use other than ART?	No	150	69.1
	Yes	67	30.9
Do you have a psychiatric disorder?	No	202	93.1
	Yes	15	6.9
Have you been infected with COVID-19?	No	215	99.1
	Yes	2	0.9
Has anyone around you been infected with COVID-19?	No	184	84.8
	Yes	33	15.2
Do you think you have enough information about COVID-19?	No	12	5.5
	Yes	205	94.5
Do you think you have taken adequate measures for protection?	No	7	3.2
	Yes	210	96.8
Do you think that COVID-19 will take a worse course in people infected with HIV?	No	155	71.4
	Yes	62	28.6
Presence of anxiety (cutoff = 11)	No	189	87.1
	Yes	28	12.9
Presence of depression (cutoff = 8)	No	157	72.4
	Yes	60	27.6

ART: Antiretroviral therapy;   MSM: Men who have sex with men

Table 2. Relation of the presence of anxiety and depression with age and duration of disease

	Age			p^*	Duration of Disease			p^*
	n	Mean	SD		n	Mean	SD	
Anxiety is absent	189	37.81	11.650	0.602	189	4.32	3.269	0.550
Anxiety is present	28	39.04	10.847		28	4.71	2.955	
Depression is absent	157	36.26	10.843	<0.001	157	4.27	3.277	0.336
Depression is present	60	42.45	12.161		60	4.65	3.102	

*: Independent samples t-test

DISCUSSION

The present study was carried out during the second wave of the pandemic in Turkey, among PWLH who were followed up at our clinic. The results indicated some problems in accessing and utilization of health services and disruption in the continuity of care with a significant impact on the mental health of PWLH.

In our study, we found that 27.6% of the patients had depression, 12.9% had anxiety, and 8.3% had both depression and anxiety according the HADS. Depression and anxiety scores in the present study were comparable to those carried out on Turkish medical oncology in-patients where authors had used HADS, and reported the mean anxiety score as 6.59±4.91, and the mean depression subscale score as 6.34±4.8 (Bektas & Demir 2006).

In our sample, depression and anxiety scores were significantly higher among those with a low-income, those who lost their job, and those who had concerns of being stigmatized when they presented to hospitals. Additionally, depression scores were higher in middle and lower school graduates, those who discontinued medication, and those who cannot work remotely. Anxiety scores were higher in those with previous psychiatric disorders, those who were concerned about not being able to access their physician, and those who discontinued medication. Moreover, we observed that the probability of having depression increased significantly with increasing age.

Anxiety is a feeling of fear and uneasiness that occurs when faced with stressful situations or uncertainties, which is reported to be more common in HIV-positive individuals compared to rest of the population (Clucas et al. 2011). Depression, on the other hand, is the most frequently reported psychiatric disorder after substance use in PLWH (Rabkin 2008). Patients with HIV may have anxiety, especially comorbid with depression. In a study that included 1125 HIV-infected patients, Pence et al. reported a major depression in 13.6% of patients, and any anxiety disorder including post-traumatic stress disorder (PTSD) in 16.4% their sample. Out of any mood/ anxiety diagnosis group, they reported that 76% had 'clinically significant depression' which included subthreshold cases or depressive symptoms secondary to medical conditions (Pence et al. 2006). In our sample, depression rate was higher with 27.7% and anxiety was rate was comparable (12.9%) given that Pence et al. included PTSD as well. Although physicians did not interrupt their communication with PLWH patients in the first phase of the pandemic, when healthcare professionals had to divert most of their energy to COVID-19 patients in the later stage of the pandemic, some disruptions were experienced in routine outpatient services. In our study, we determined that all of our patients postponed their hospital appointments for follow-up in the first months of the pandemic, even though it had been deemed necessary. Some of our patients stated their concern about being stigmatized when they went to hospitals for consultations. HIV-related stigma is a common problem in PLWH and affects their quality of life. A meta-analysis of 55 articles by Chambers L. A. et al pointed out that HIV-related stigma was a global social phenomenon for PLWHs seen in many social areas, including healthcare settings (Chambers et al. 2015). Fear of HIV-related stigma and anxiety about not being able to access their usual physician were added to the anxiety of having COVID-19, which in turn increased the anxiety burden of the patient. Our study showed high anxiety scores in patients worried about not reaching their usual physician and HIV-related stigma. Similarly high depression scores were observed in those with fear of HIV-related stigma. Interruption or discontinuation of ART treatment was also associated with higher likelihood of depression/anxiety.

The probability of depression was also higher with advancing age. This issue of higher level of social isolation among older individuals with HIV due to physical distancing guidelines was raised previously, which could be related to depression (Shiau et al. 2020).

In our study, 71.4% of the patients stated that HIV infection was not a cause for the severe course of COVID-19. The frequency of depression was found to be significantly higher in HIV-infected patients who believed that COVID-19 would have a more severe course. Costenaro et al. reported in a review that it is unclear whether HIV affects the course of COVID-19 (Costenaro et al. 2021). Mirzaei et al. reported in a review that individuals, whether HIV-infected or not, had similar risks and progression of the disease (Mirzaei et al. 2021). It has also been reported by the European AIDS Clinical Society (EACS) that patients with a suppressed viral load, normal CD4 T lymphocytes, and continuing ART do not have an increased risk of disease (EACS 2020). Hence, it is important for clinicians to provide PWLH with the correct information on COVID-19 in relation to HIV, in order to protect their mental wellbeing as well as physical health.

Table 3. Relationships between Depression and Anxiety score and categorical data

Characteristics	Category	Anxiety score			$p*$	Depression score			$p*$
		n	Mean	SD		n	Mean	SD	
Gender	Male	199	5.94	3.782	0.092	199	5.24	3.866	0.465
	Female	18	7.50	3.111		18	5.94	4.595	
Educational Status	Primary school	23	6.30	3.390	0.418	23	7.43[a]	3.578	*0.002*
	Middle School	18	7.33	4.863		18	7.22[a]	4.453	
	High school	39	6.26	4.159		39	5.69[ab]	4.537	
	University	137	5.82	3.519		17	4.57[b]	3.510	
Income group (TL)	Unemployed	32	5.94[a]	4.508	*0.025*	32	6.19[a]	4.687	*0.001*
	Low income	16	9.06[b]	3.941		16	9.06[b]	3.924	
	Low-medium	81	5.86[a]	3.556		81	5.51[a]	3.831	
	Medium-high	66	5.74[a]	3.596		66	3.89[a]	3.099	
	High income	22	5.86[a]	2.817		22	4.68[a]	3.257	
Way of transmission	Sexually	191	6.04	3.808	0.928	191	5.19	3.860	0.406
	Blood-borne	1	7.00			1	3.00		
	Other	25	6.28	3.410		25	6.20	4.416	
MSM	No	31	6.00	4.219	0.930	31	5.58	4.334	0.591
	Yes	168	5.93	3.710		168	5.17	3.785	
Have you ever concerned about not being able to access your usual doctor?	No	85	5.14	3.163	*0.003*	85	4.68	3.506	0.065
	Yes	132	6.67	3.980		132	5.69	4.137	
Did you worry about being stigmatized if you went to hospital for consultation?	No	102	5.24	3.747	*0.002*	102	4.64	3.820	*0.020*
	Yes	115	6.82	3.607		115	5.88	3.941	
Have you lost your job?	No	157	5.75	3.693	*0.037*	157	4.95	3.811	*0.035*
	Yes	60	6.93	3.791		60	6.20	4.104	
Did you work remotely?	No	148	6.07	3.829	0.972	148	5.82	4.112	*0.003*
	Yes	69	6.09	3.600		69	4.16	3.234	
Were you alone at home during this period?	No	154	6.06	3.833	0.957	154	5.47	4.004	0.294
	Yes	63	6.10	3.568		63	4.86	3.719	
Did you have a break with ART during this period?	No	204	5.98	3.695	0.147	204	5.17	3.792	*0.050*
	Yes	13	7.54	4.427		13	7.31	5.422	
Did you stop the ART during this period?	No	210	5.98	3.695	*0.046*	210	5.21	3.880	0.079
	Yes	7	8.86	4.598		7	7.86	4.706	
Do you have a chronic medical disease?	No	165	6.12	3.660	0.773	165	5.38	4.005	0.563
	Yes	52	5.94	4.056		52	5.02	3.681	
Is there any medicine you use other than ART?	No	150	5.91	3.615	0.327	150	5.19	3.832	0.569
	Yes	67	6.45	4.039		67	5.52	4.146	
Do you have a psychiatric disorder?	No	202	5.86	3.618	*0.002*	202	5.19	3.904	0.142
	Yes	15	9.00	4.375		15	6.73	4.061	
Have you been infected with COVID-19?	No	215	6.09	3.761	0.552	215	5.32	3.932	0.407
	Yes	2	4.50	2.121		2	3.00	2.828	
Has anyone around you been infected with COVID-19?	No	184	6.07	3.680	0.977	184	5.26	3.850	0.727
	Yes	33	6.09	4.179		33	5.52	4.374	
Do you think you have enough information about COVID-19?	No	12	5.08	3.753	0.348	12	4.75	4.003	0.622
	Yes	205	6.13	3.750		205	5.33	3.928	
Do you think you have taken adequate measures for protection?	No	7	7.29	3.817	0.386	7	7.43	5.968	0.144
	Yes	210	6.03	3.750		210	5.22	3.839	
Do you think that COVID-19 will take a worse course in people infected with HIV?	No	155	6.05	3.666	0.891	155	4.99	3.798	0.074
	Yes	62	6.13	3.981		62	6.05	4.162	

The superscript letters located near the means in the table were used to express the significant differences between the compared categories. If there are different letters next to the means, those categories are significantly different from each other (for example, if one has the letter "a" and the other the letter "b"). Categories with the same or common letter indicate that there is no significant difference between them;   *: One-Way ANOVA

Of the patients, 94.5% stated that they had sufficient knowledge about COVID-19 and 96.8% thought that they had taken all the precautions. The desire to search and have knowledge on a subject is an important positive coping method with stress through problem solving (Yan et al. 2021, Nowack 1989). This approach

Table 4. Multiple ANCOVA model results for anxiety score and depression score

Variables	P
Anxiety score	
Gender	*0.042*
Income groups(TL)	*0.027*
Have you ever concerned about not being able to access your usual doctor?	*0.034*
Did you worry about being stigmatized if you went to hospital for consultation?	*0.049*
Have you lost your job?	0.105
Did you stop the ART during this period?	0.077
Do you have a psychiatric disorder?	*0.002*
Educational Status	0.497
Income groups (TL)	*0.007*
Have you ever concerned about not being able to access your usual doctor?	0.561
Did you worry about being stigmatized if you went to hospital for consultation?	*0.026*
Have you lost your job?	0.149
Depression Score	
Did you work remotely?	0.137
Did you have a break with ART during this period?	0.334
Did you stop the ART during this period?	0.860
Do you think that COVID-19 will take a worse course in people infected with HIV?	0.117
Age	*0.009*

Italics text indicates a statistically significant correlation with a p-value less than 0.05

applies not only to PLWH, but to the entire society faced with great uncertainty like the current pandemic. Higher depression scores in middle and lower school graduates may be due to their lack of knowledge on this subject. Prevention measures such as hand washing, wearing masks and social distancing, which our patients pay attention to, are accepted rules in all over the world. Similar to our study, a study on the general population in Germany reported an increase of more than 90% in hand washing habits and a compliance with protection measures such as avoiding crowded places (Jungmann & Witthöft 2020). An international study on PLWH reported compliance with social distancing in 89.9%, wearing masks in 65.9% and regular hand washing in 87.4% (Siewe Fodjo et al. 2020).

Lack of an effective therapeutic cure or a long-term preventive vaccine for COVID-19 causes anxiety in the whole society. High depression scores are not surprising for those who do not have the opportunity to work remotely. Moreover, the risk of the job loss, loneliness and financial problems during the pandemic would naturally affect these individuals who are more prone to anxiety and depression compared to the other part of the society. Different studies have reported an association between economic stress factors such as financial difficulties and unemployment and anxiety and depression

(Viseu et al. 2018, Latsou & Geitona 2018). In a study involving data from 6 European countries (Italy, Spain, Czech Republic, Slovakia, Netherlands, and Germany) conducted during the COVID-19 pandemic, Witteveena and Velthorst showed a relationship between economic difficulties and depression (Witteveena & Velthorst 2020). Unfortunately, COVID-19 has affected the economy all over the world, causing great economic and mental problems. In our study, both anxiety and depression scores were higher in those with low income and job loss.

An internet survey covering 1 051 MSM (11.6% PLWH) in the United States detected increased anxiety due to COVID-19 (Sanchez et al. 2020). In another survey covering 2 732 gay men and other MSM (17% PLWH), anxiety was detected in 34% of the participants (Santos et al. 2021). MSM constituted 84.4% (*n*=164) of the men who participated in our survey and there was a higher frequency of anxiety in non-MSM instead of MSM. There are various studies from different countries reporting the negative effects on mental health of PLWHs during this pandemic process. In an online survey in our country, Kuman Tunçel et al. showed that a significant portion of participant PLWHs were anxious during the pandemic period (Kuman Tunçel et al. 2020). Another international, multilingual and web-based survey including 317 PLWHs found major depression in 23.3% of the participants and generalized anxiety disorder in 22.7% (Siewe Fodjo et al. 2020). In Spain, Ballester-Arnal, and Gil-Llario, reported that patients experienced high levels of fear, anxiety and stress during this period (Ballester-Arnal & Gil-Llario 2020). In China, Sun et al. reported a deterioration in mental health in PLWHs, which could be attributed to disruptions in the follow-up of patients and the provision of medications, anxiety of being infected, and increased stigmatization (Sun et al. 2020). In a survey study involving 167 patients in India, Marbaniang et al. has detected a high prevalence of generalized anxiety in PLWHs (Marbaniang et al. 2020). In the United States, Ridgway et al. pointed out that health services should be revised to remotely support physical and mental health (Ridgway et al. 2020). It seems that there is a need for comprehensive studies involving more patients to evaluate the mental status of PLWHs during the pandemic period.

The limitations of our study include the absence of a control group, the absence of a balanced distribution between genders, and the inclusion of data from a single center. The fact that substance use was not questioned in the sample was another limitation. However, the strength of our study is the use of a survey design through face-to-face interview method.

CONCLUSIONS

In our study, we observed a disruption in the follow-up and usual treatment process and a negative impact on mental health in a significant portion of PLWHs during the COVID-19 pandemic. In order to support the mental

health of PLWHs during the pandemic, it is necessary to ensure the continuity of patient-doctor communication and the use of ARTs, to support those with psychiatric disorders and economic difficulties, to provide updated information to patients and develop new strategies that will make individuals feel safe without being stigmatized.

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Correspondence:

Pınar Ergen, MD
Department of Infectious Diseases and Clinical Microbiology, Istanbul Medeniyet University
Göztepe Training and Research Hospital
Enfeksiyon Hastaliklari Klinigi, Dr. Erkin Caddesi, 34722, Kadikoy, Istanbul, Turkey
E-mail: pergen71@hotmail.com