

# Factors Affecting Treatment Compliance of Patients with COPD During the COVID-19 Pandemic

Sibel Dogru<sup>1</sup> , Füsün Fakili<sup>1</sup> , Sema Aytac<sup>2</sup> , Cengizhan Sezgi<sup>1</sup> , Mahşuk Taylan<sup>1</sup> , Nazan Gülhan Bayram<sup>1</sup> , Meral Uyar<sup>1</sup> 

<sup>1</sup> Department of Pulmonary Medicine, Gaziantep University, Faculty of Medicine, Gaziantep, Turkey

<sup>2</sup> Nursing Department, Gaziantep University, Faculty of Health Sciences, Gaziantep, Turkey

Received: 2023-08-03 / Accepted: 2023-11-06 / Published Online: 2023-11-07

## Correspondence

Sibel Dođru, Assist. Professor, MD  
**Address:** Department of Pulmonary  
Medicine, Gaziantep University,  
Gaziantep, Turkey.  
**E mail:** [drsibelahmet@hotmail.com](mailto:drsibelahmet@hotmail.com)

## ABSTRACT

**Objective:** This study aimed to investigate the effects of difficulties experienced in the follow-up and treatment during the Coronavirus 2019 pandemic (COVID-19p), which included COVID-19 phobia and depression, on treatment compliance in patients with Chronic Obstructive Pulmonary Disease (COPD).

**Methods:** This study included 123 patients with COPD. The COVID-19 Phobia Scale (C19P-S), Beck Depression Inventory (BDI), and Medication Adherence Report Scale (MARS) were used to assess the patients.

**Results:** The mean age of patients with COPD was  $64.56 \pm 9.31$  years. It was determined that our patients did not maintain regular outpatient follow-up mostly because of the fear of COVID-19 transmission (75.9%). Overall, 24% of our patients showed treatment noncompliance. A statistically significant relationship was found between COPD stages B and D and treatment compliance ( $p=0.01$ ). Patients with frequent emergency department admissions ( $p = 0.01$ ) and those with high BDI ( $p = 0.01$ ) and C19P-S ( $p = 0.02$ ) scores during the pandemic were found to have reduced treatment compliance.

**Conclusion:** Patients with COPD with COVID-19 phobia, and depression had reduced treatment compliance. It is necessary to be aware of these conditions and to plan appropriate interventions.

**Keywords:** Coronaphobia, Depression, Compliance, Treatment, Chronic obstructive pulmonary disease



This work is licensed under a Creative  
Commons Attribution-NonCommercial 4.0  
International License.

## INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is one of the leading causes of morbidity and mortality worldwide [1]. Regular monitoring of exposure to risk factors, symptoms, and treatment effectiveness in disease management is recommended. Although effective treatments are available for COPD management, treatment noncompliance among patients with COPD is a major issue [2].

The COVID-19 pandemic has adversely affected daily life activities. Strict measures, disruption in daily routines, fear of transmission and restrictions on health services cause widespread anxiety, fear, and depression among individuals in a society [3,4].

COVID-19 anxiety, also known as “Corona phobia,” which is based on fear and anxiety refers to the state of constant and excessive fear of COVID-19 transmission, intolerance of

uncertainty, inappropriate behavior due to fear of transmission, emotional stress, and avoidance of people [3]. The fear of COVID-19 was more prevalent in Polish patients with taking anticoagulants, women and elderly [5]. However, the effect of COVID-19 phobia on treatment compliance of chronic diseases, especially how it affects compliance with COPD treatment, is not well known.

This study aimed to investigate the effects of depression, COVID-19 phobia, restrictions for pandemic control, transportation problems, and difficulty in accessing the health system during the pandemic on the treatment compliance of patients with COPD.

## MATERIALS AND METHODS

This study is a single-center, cross-sectional study conducted between February 1, 2021 and March 30, 2022 in the Chest Diseases Clinic in a tertiary healthcare institution.

Patients who were diagnosed with COPD at least 3 months before the onset of the pandemic; aged >40 years; who had no communication, hearing, or speech problems; and who agreed to participate in the study were included in this study. The patients were informed with written consent form approved by the ethics committee of the institution, and patient consent was obtained. The sample size of the study was calculated by using power analysis. Minimum sample size was calculated as 123 ( $\alpha=0.05$ ),  $1-\beta=0.80$ ). The patients included in the study were COPD patients whom we had previously diagnosed in this clinic in accordance with the GOLD guideline:

**Stage A:** Those who have no history of exacerbation in the last year or who have had one exacerbation that did not require hospitalization, who only have shortness of breath during heavy exercise or when walking fast on a flat road.

**Stage B:** Those who have no history of exacerbation in the last year or who have had one exacerbation that did not require hospitalization, who have to walk slower than their peers due to shortness of breath, or who have shortness of breath when walking 100 meters on a flat road, or who have shortness of breath at rest.

**Stage C:** Those who have had two or more exacerbations in the last year or have had one or more exacerbations requiring hospitalization and have shortness of breath only during heavy exercise or when walking fast on flat ground.

**Stage D:** Those who have had two or more exacerbations in the last year or have had one or more exacerbations requiring hospitalization and who have to walk slower than their peers due to shortness of breath or have shortness of breath when walking 100 meters on a flat road or have shortness of breath at rest [6].

Questionnaire form was prepared by the researchers by examining related literature [1-3]. This form had 19 questions regarding the sociodemographic and COPD disease-related characteristics of the participants.

**The COVID-19 Phobia Scale (C19P-S):** In order to evaluate the COVID-19 phobia status of patients, Arpacı et al. developed. It is a 20-item, 5-point Likert-type self-report scale developed to assess phobia in patients. The scale items are rated as follows: 1. I strongly disagree, 2. I disagree, 3. I agree, 4. Overall, I agree, and 5. I strongly agree. These scores ranged from 20 to 100 [7].

**Beck Depression Inventory (BDI):** was used to assess the depression status. The BDI scale consisted of 21 questions [8]. The Turkish validity and reliability test of the scale was conducted by Hisli et al. The questions were scored between 0–3 [9].

**Medication Adherence Report Scale (MARS):** The Medication Compliance Report Scale (MARS) was used to analyze treatment compliance [10]. The validity and reliability of the Turkish version were analyzed by Şen et al 2019 [11]. The scores for each item were added to determine the total score, which ranged between 5 and 25. High MARS scores indicated high levels of compliance. The patients were classified into two groups as ‘Compliant’ (MARS score  $\geq 23$ ) and ‘Noncompliant’ with treatment (MARS score  $< 23$ ) [12]. The total scores obtained from each scale were recorded in the questionnaire form.

The questionnaire form and scales were filled by researchers using a face-to-face interview technique in the pulmonology department. Due to the few number of patients who applied to the outpatient clinic due to pandemic conditions, 30 patients were reached by phone and a questionnaire form and scales were applied.

Data were statistically analyzed using IBM SPSS Statistics (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) on P5 to the Statistical Analysis.

**Data Assessment**

The patients were classified into two groups as ‘Compliant’ and ‘Noncompliant’ with treatment [12]. Treatment compliance was considered as the dependent variable. The association between categorical variables was analyzed using chi-square test. The association between numerical variables was tested using a correlation coefficient. For the comparison of scalar data between the subgroups of two categorical variables, Student’s t-test was used for the normally distributed data, whereas the Mann–Whitney U test was used for the non-normally distributed data. The one-way analysis of variance or Kruskal–Wallis test was used to compare numerical variables in three independent groups. Binary logistic regression was applied to evaluate the COPD stage, frequency of emergency department admissions during the pandemic, BDI and C19P-S scores, which were associated with treatment compliance. P value of <0.05 was considered statistically significant.

**RESULTS**

The mean age of 123 patients with COPD included in this study was 64.5 ± 9.3 years, and 92.7% were male. The rates of comorbid diseases and smoking were 56.9% and 24.4%, respectively. Most patients were in COPD stages D (52.8%) and B (31.7%). The general characteristics and treatment compliance status of the patients are summarized in the Table 1. Overall, 75.6% (93) of the patients were compliant with the treatment.

Overall, 24,4% (n = 30) of our patients were noncompliant with the treatment. A statistically significant relationship was found between COPD stages B and D and treatment compliance (p=0.01). Treatment compliance in stages B and D was less than in other stages.

Further, patients with frequent emergency department admissions (p = 0.01) and those with high BDI (p = 0.001) and C19P-S (p = 0.02) scores during the pandemic were found to have reduced treatment compliance. The binary logistic regression analysis of significant variables revealed that an increase in the BDI score by 1 unit increased the noncompliance with treatment by 1.15 units.

The frequency of admission to the emergency department due to COPD did not change in patients during the pandemic period, but outpatient follow-up decreased in 42.3% of them during the pandemic period (Table 1).

It was determined that the most common reason among patients for not visiting the outpatient clinic for regular follow-up was the fear of coronavirus transmission during the pandemic (33.3%). Patients who felt well, regardless of the pandemic restrictions, also missed their outpatient clinic visits (%4.9) (Table 2).

Variables	Number of patients (%. n)	Noncompliant with Treatment (%. n)	Compliant with Treatment (%. n)	p value
<b>Age (Mean ± SD)</b>	64.5±9.3	62.72±9.14	65.12±9.3	0.23
<b>Sex</b>				0.36
Male	92.7 (114)	23 (26)	77(77)	
Female	7.3 (9)	33.3 (3)	66.7 (6)	
<b>Education</b>				0.73
Educated	109	24.8 (27)	75.2 (82)	
Uneducated	13	15.4 (2)	84.6 (11)	
<b>Smoking</b>				0.35
Not smoke	10.7 (13)	23.1 (3)	76.9 (10)	
Quit smoking	64.5 (78)	26.9 (21)	73.1 (57)	
Smoking	24.8 (30)	16.7 (5)	73.1 (57)	

<b>Comorbid diseases</b>				0.07
Yes	57.98 (69)	21 (30.4)	46 (696)	
No	42.02 (50)	8 (16)	42 (84)	
<b>Number of drugs used for comorbid diseases</b>	2 (2)	2.2 (2.5)	2.9 (1.9)	0.24
<b>COPD stage</b>				<b>0.01**</b>
A	5.7 (7)	0 (0)	5.7 (7)	
B	30.9 (38)	10.5 (4)	31.1 (38)	
C	9.8 (12)	16.7 (2)	9.8 (12)	
D	35.4 (23)	64.6 (42)	53.3 (65)	
<b>Number of inhalers used for COPD</b>	2 (0.9)	2 (0.9)	1.8 (0.7)	0.37
<b>Treatment regimen during the prepandemic period</b>				0.08
Regular	95.8 (115)	21.7 (25)	78.3 (90)	
Irregular	4.2 (5)	60 (3)	40 (2)	
<b>Outpatient follow-up during the prepandemic period</b>				0.86
Regular	16.5 (20)	22.7 (20)	77.3 (68)	
Irregular	6.6 (8)	24.2 (8)	75.8 (25)	
<b>Frequency of emergency service admission during the pandemic period</b>				<b>0.01**</b>
Increased	23.8 (28)	39.3 (11)	60.7 (17)	
Unchanged	50.4 (61)	13.1 (8)	86.9 (53)	
Decreased	27 (33)	30.3 (10)	69.7 (23)	
<b>Frequency of hospitalization during the pandemic period</b>				0.07
Increased	12.3 (15)	46.7 (7)	53.3 (8)	
Unchanged	66.4 (81)	19.8 (16)	80.2 (65)	
Decreased	21.3 (26)	23.1 (6)	76.9 (20)	
<b>Outpatient follow-up during the pandemic period</b>				0.12
Increased	13.1 (16)	43.8 (7)	56.3 (9)	
Unchanged	44.3 (54)	22.2 (12)	77.8 (42)	
Decreased	42.6 (52)	19.2 (10)	80.8 (42)	
<b>Beck Depression Inventory Scale score (mean ± SD)</b>	11.9 (9.29)	20.2	9.15	<b>0.01*</b>
<b>COVID-19 Phobia Scale score (mean ± SD)</b>	42.6 (12.5)	41.13	47.13	<b>0.02*</b>

Note: SD: Standard deviation. \*: Independent samples t-test. \*\*: Chi-square test

**Table 2.** The reason for the decrease in outpatient control during the pandemic period

	Frequency	Percent
Fear of COVID-19 transmission	41	33.3
I could not get an appointment due to the restriction on outpatient clinic appointments.	1	0.8
I couldn't get out of house due to restriction	2	1.6
I could not provide transportation due to restrictions on public transportation	1	0,8
Due to restrictions imposed on elderly	2	1.6
No need for control because it feels good	6	4.9
Total	54	43.9

**Table 3.** Reasons for not using their medications regularly during the pandemic period

	Frequency	Percent
I couldn't get my medicines prescribed because I couldn't leave the house due to the fear of COVID 19 contamination.	5	4.1
I couldn't reciepie drugs because I couldn't get an outpatient appointment due to COVID 19 restrictions.	1	0.8
I couldn't get drugs because I couldn't leave the house due to quarantine measures	1	0.8
Total	7	5.7

Our patients who received irregular treatment stated that they had difficulty for obtaining their medications because they could not go to the health institution because of the fear of COVID-19 transmission (%4.1) Restrictions on outpatient clinic appointments (%0.8) and quarantine measures (%0.8) prevented patients from obtaining their treatments (Table 3).

## DISCUSSION

The appropriate use of adherence to daily controller medications is important for patients with respiratory illnesses during the coronavirus disease 2019 (COVID-19) pandemic [13]. In this study, 24,4 % of the patients were found to be noncompliant with treatment. Patients with higher COPD stage had less compliance to treatment. Patients with frequent emergency service visits and high BDI and C19P scores had higher treatment non-compliance. Studies conducted in the prepandemic period have shown that the rate of treatment noncompliance in patients with COPD were 40–60% [14,15]. There are few studies on treatment compliance rates in patients with COPD during the pandemic.

During the Covid 19 pandemic, Kaye et al. reported a noncompliance rate of 38.5–46.3% [13], whereas McAuley et al.

reported a rate of 2.5% [16]. Different results may be due to the methods used for evaluating treatment compliance. Moreover, various studies in the literature have used electronic records and surveys completed by patients [17].

This may be because individuals with chronic diseases were informed and warned to continue their medications through media and social media during the pandemic. The high cost of treatment may a factor that reduces patients compliance with [15]. In Turkey COPD drug costs are covered by social insurance. All patients in this study had social security and could obtain their medications without paying any fee. In addition, the drugs prescribed for chronic diseases during the pandemic in Turkey were extended for one year without applying to health institutions. These situations may be the reason for the higher treatment compliance rates in this study.

The impact of the COVID-19 pandemic on adherence to chronic treatments has been discussed in chronic cardiovascular conditions and chronic autoimmune diseases and potential concerns have been raised about its impact on the short- and long-term outcomes of chronic diseases [18,19]. In these studies, treatment non-compliance was detected at rates of up to 24.4%.

We found that patients with advanced COPD stages were less likely to comply with treatment. Different results have been reported in the literature regarding the association between treatment compliance and COPD stage. Similarly, Park et al. reported that patients with advanced COPD had lower adherence to treatment [20]. This may be due to the complex treatment regimens and multiple drug administration in advanced stage patients. However, another study claim that patients with advanced COPD stage have better compliance as their symptoms are more severe [14].

In this study, we found that the most common causes of treatment non-adherence were COPD stage, COVID-19 phobia, depression level and frequency of emergency service admission during the pandemic period. However we did not find a statistically significant relationship between treatment non-adherence and age, gender, education level, number of comorbid diseases, number of drugs. Patients not compliant with treatment could not get their medicines due to pandemic conditions because they could not leave the house due to the fear of COVID-19 (5, 4.1%), quarantine measures (1, 0.8%), due to the fact that they cannot have their medications prescribed due to restrictions. Also, Zhang et al. reported that total of 27.3% of patients did not return to the hospital for a prescription for fear of the COVID-19 outbreak; 85.7% reported that they chose to visit the hospital whose condition worsened [21].

In this study, a higher number of emergency department admissions were reported in noncompliant patients (39,3%). Similarly, Chen et al. reported, noncompliance with treatment increases the frequency of admission to the emergency department (66 %) [22]. This situation suggested that the use of irregular and ineffective treatment may increase the number of attacks.

We found that patients with high COVID-19 phobia levels had lower compliance to treatment. Moreover, we found that patients with increased fear of COVID-19 had more frequent emergency admissions. This may be because these patients prefer applying to the emergency department owing to the restrictions imposed on outpatient clinic appointments during the pandemic.

This study we observed a significant association between the level of depression and non-compliance with treatment. Depression and anxiety were reported to be the most common psychological disorders in previous global epidemics [23]. A study conducted in the first two months of the pandemic revealed that the most

important factor affecting treatment compliance was the level of depression [21].

### Limitations

This study has several limitations; Data were collected from a single center and treatment compliance was evaluated based on patients self-reports. Another limitation of the study was that not all patients could be interviewed face to face due to pandemic conditions. A larger number of patients would be more beneficial for the study results.

### CONCLUSION

One of the few studies reporting in the literature evaluating the relationship between fear of COVID-19 and compliance to treatment in COPD patients. We found that patients with COVID-19 phobia, depression, frequent emergency department admissions as well as those with advanced stage COPD had reduced compliance with treatment. For future epidemics or emergencies, it is necessary to be aware of these situations and plan appropriate interventions.

**Acknowledgments:** The authors are grateful to the anonymous reviewers for their comments, which have helped to improve the paper.

**Conflict of interest:** The authors declare no conflict of interest

**Funding:** This study received no funding

**Informed Consent:** Participation in the study was based on voluntariness, and consent was obtained from all patients after being informed about the study by the researcher.

**Author Contributions:** Concept – SD; Design – SD, MT; Supervision – NB, SA; Materials – FF; Data Collection and/or Processing – SD, CS; Analysis and/or Interpretation –MT ; Literature Review –MU; Writing –SD; Critical Review –MU.

**Ethics Committee Approval:** Approval was obtained from Gaziantep University, Clinical Research Ethics Committee Committee to conduct the study (Dated 2021, Decision no 17). This study complied with the research and publication ethics. This study was carried out in accordance with the Helsinki Declaration.

## REFERENCES

- [1] Adeloye D, Chua S, Lee C, Basquill C, Papan A, Theodoratou E, Nair H, Gasevic D, Sridhar D, Campbell H, Chan KY (2015) Global and regional estimates of COPD prevalence: Systematic review and meta-analysis. *J Glob Health*. 5(2):020415. <https://doi.org/10.7189/jogh.05.020415>
- [2] Humenberger M, Horner A, Labek A, Kaiser B, Frechinger R, Brock C, Lichtenberger P, Lamprecht B (2018) Adherence to inhaled therapy and its impact on chronic obstructive pulmonary disease (COPD). *BMC Pulm Med*. 18(1):1-6. <https://doi.org/10.1186/s12890-018-0724-3>
- [3] Asmundson GJ, Taylor S (2020) Coronaphobia: Fear and the 2019-nCoV outbreak. *J Anxiety Disord*. 70:102196. <https://doi.org/10.1016/j.janxdis.2020.102196>
- [4] Westgard BC, Morgan MW, Vazquez-Benitez G, Erickson LO, Zwank MD (2020) An analysis of changes in emergency department visits after a state declaration during the time of COVID-19. *Ann Emerg Med*. 76(5):595-601. <https://doi.org/10.1016/j.annemergmed.2020.06.019>
- [5] Agrawal S, Drózdź M, Makuch S, Pietraszek A, Sobieszcańska M, Mazur G (2021) The assessment of fear of COVID-19 among the elderly population: A cross-sectional study. *J. Clin. Med*. 10(23):5537. <https://doi.org/10.3390/jcm10235537>
- [6] Gupta N, Malhotra N, Ish P (2021) GOLD 2021 guidelines for COPD—what's new and why. *Adv Respir Med*. 89(3):344-346. <https://doi.org/10.5603/ARM.a2021.0015>
- [7] Arpacı I, Karataş K, Baloğlu M (2020) The development and initial tests for the psychometric properties of the COVID-19 Phobia Scale (C19P-S). *Pers Individ Dif*. 164:110108. <https://doi.org/10.1016/j.paid.2020.110108>
- [8] Beck AT, Steer RA, Carbin MG (1988) Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clin Psychol Rev*. 8(1):77-100. [https://doi.org/10.1016/0272-7358\(88\)90050-5](https://doi.org/10.1016/0272-7358(88)90050-5)
- [9] Hisli N (1989) Validity and reliability of Beck Depression Inventory for university students. *Psikoloji Dergisi*.;7(23):3-13.
- [10] Horne, R., and M. Hankins (2001) The MARS-5: an instrument to assess self-reported adherence to medication prescriptions. Unpublished manuscript, University of Brighton, UK.
- [11] Şen ET, Sertel BÖ, Sindel D (2019) İlaç uyumunu bildirim ölçeği'nin türkçe uyarlamasının geçerlik ve güvenilirlik çalışması. *Journal of Istanbul Faculty of Medicine* 82(1):52-61. <https://doi.org/10.26650/IUITFD.413637>
- [12] Sjölander M, Eriksson M, Glader EL (2013) The association between patients' beliefs about medicines and adherence to drug treatment after stroke: a cross-sectional questionnaire survey. *BMJ open*. 3(9):e003551. <https://doi.org/10.1136/bmjopen-2013-003551>
- [13] Kaye L, Theye B, Smeenk I, Gondalia R, Barrett MA, Stempel DA (2020) Changes in medication adherence among patients with asthma and COPD during the COVID-19 pandemic. *J Allergy Clin Immunol Pract*. 8(7):2384. <https://doi.org/10.1016/j.jaip.2020.04.053>
- [14] Restrepo RD, Alvarez MT, Wittnebel LD, Sorenson H, Wettstein R., Vines DL, Sikkema OJ, Gardner DD, Wilkins RL (2008) Medication adherence issues in patients treated for COPD. *Int J Chron Obstruct Pulmon Dis*. 3(3):371-384. <https://doi.org/10.2147/copd.s3036>
- [15] Ágh T, Udvardy MA (2012) Adherence to Therapy in Chronic Obstructive Pulmonary Disease.
- [16] McAuley H, Hadley K, Elneima O, Christopher EB, Rachael AE, Michael CS, Neil J G (2021) COPD in the time of COVID-19: an analysis of acute exacerbations and reported behavioural changes in patients with COPD. *ERJ Open Res*. 7(1). <https://doi.org/10.1183/23120541.00718-2020>
- [17] Bourbeau J, Bartlett SJ (2008) Patient adherence in COPD. *Thorax*. 63(9):831-838. <https://doi.org/10.1136/thx.2007.086041>
- [18] Chagué F, Boulin M, Eicher JC, Bichat F, Saint Jalmes M, Cransac-Miet A, Soudry-Faure A, Danchin N, Cottin Y, Zeller M (2020) Impact of lockdown on patients with congestive heart failure during the coronavirus disease 2019 pandemic. *ESC heart fail*. 7(6):4420-4423. <https://doi.org/10.1002/ehf2.13016>
- [19] Degli EL, Buda S, Nappi C, Paoli D, Perrone V (2020) Network Health-DB. Implications of covid-19 infection on medication adherence with chronic therapies in italy:

- A proposed observational investigation by the fail-to-refill project. *Risk Manag Healthc Policy*. 3179-3185. <https://doi.org/10.2147/RMHP.S265264>
- [20] Park S, Kang Y (2017) Symptom experience, self-efficacy, depression, and medication adherence in patients with chronic obstructive pulmonary disease. *J Korean Clin Nurs Res*. 23(2):170-178. <https://doi.org/10.22650/JKCNR.2017.23.2.170>
- [21] Zhang HQ, Lin JY, Guo Y, Pang S, Jiang R, Cheng QJ (2020) Medication adherence among patients with chronic obstructive pulmonary disease treated in a primary general hospital during the COVID-19 pandemic. *Ann Transl Med*. 8(18):1179. <https://doi.org/10.21037/atm-20-6016>
- [22] Chen R, Gao Y, Wang H, Shang H, Xuan J (2020) Association between adherence to maintenance medication in patients with COPD and acute exacerbation occurrence and cost in China: a retrospective cohort database study. *Int J Chron Obstruct Pulmon Dis*. 963-971. <https://doi.org/10.2147/COPD.S234349>
- [23] Lee SM, Kang WS, Cho AR, Kim T, Park JK (2018) Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Compr Psychiatry*. 87:123-127. <https://doi.org/10.1016/j.comppsy.2018.10.003>

***How to Cite;***

Dogru S, Fakili F, Aytac S, Sezgi C, Taylan M, Bayram NG, Uyar M (2023) Factors Affecting Treatment Compliance of Patients with COPD During the COVID-19 Pandemic. *Eur J Ther*. 29(4):698-705. <https://doi.org/10.58600/eurjther1752>