

# The impact of the COVID-19 pandemic on the orthopaedics outpatient clinic

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**Abstract. – OBJECTIVE:** The COVID-19 pandemic has significantly impacted orthopaedic practice since it started. In our study, we aimed to examine these effects on outpatient services.

**PATIENTS AND METHODS:** The patients who applied to the orthopedic outpatient clinic (n=1,518) in six months period under the effect of the COVID-19 pandemic (September 2020-March 2021) and patients (n=1,207) who applied during the same period before the pandemic (September 2019-March 2020) were analyzed according to the demographic characteristics (age, gender), reasons for admission, duration of complaints, treatments applied, surgical acceptance rate, and compliance with treatment.

**RESULTS:** The mean age in the pre-pandemic outpatient clinic admissions was 39.1 years (1-91 years), the gender ratio was 635/572 (Female/Male), the mean age of the patients was 38.1 years (1-95), and the sex ratio was 793/725 (F/M) during the pandemic. Admissions of patients with acute complaints decreased after the pandemic, and applications for subacute or chronic complaints increased. Applications for sports medicine, pediatrics, and hand surgery increased, applications for trauma, foot and ankle surgery decreased, and applications for oncology and spine did not change. Conservative treatment recommendations decreased, the surgical treatment recommendation did not change, and the rate of patients who were given only follow-up decisions increased. There was no significant difference in the treatment rejection and surgical acceptance rate.

**CONCLUSIONS:** We observed that the number of traumas decreased, and the hospital admission duration extended. The increase in the consultation rate and follow-up preference indicates that the treatment is more conservative in this period. In this process, patients should be adequately informed about the precautions taken, and their treatment should not be interrupted.

*Key Words:*

COVID-19, Orthopaedics, Orthopaedic outpatient services.

## Introduction

The pandemic of COVID-19 infection caused by the coronavirus (SARS-CoV-2), which spread from the city of Wuhan, China, in late 2019, continues to affect millions of people worldwide<sup>1,2</sup>. As in all medical branches, pandemic effects were observed in orthopaedics and traumatology, as many elective operations had to be postponed, a greater range of equipment was required with the highest levels of sterilization, and the allocation of orthopaedic department staff to units caring for pandemic patients<sup>3-6</sup>.

During the COVID-19 pandemic, elective surgeries were postponed, restrictions were imposed on outpatient services, the number of patients waiting for surgery increased, and admissions to hospitals, including emergency services, decreased<sup>7,8</sup>. Various measures were taken in Turkey during the COVID-19 pandemic, and similar restrictions had to be applied according to the decisions of the Ministry of Health Scientific Committee<sup>9</sup>.

Since the beginning of the pandemic, the use of personal protective equipment, social distancing, the transformation of some healthcare facilities into specialist COVID-19 centers, and lockdowns, led to anxiety, disorientation, and behavioral changes in patients. This study aimed to examine the effect of the COVID-19 pandemic on the outpatient clinic patient admission processes

and the subsequent adherence of patients to the recommended treatment.

### Patients and Methods

Approval for this study was granted by the Local Ethics Committee. The study included 1518 patients who presented at the Orthopaedics Outpatient Clinic between September 1, 2020, and March 1, 2021, which was a 6-month period during the COVID-19 pandemic. The control group consisted of 1207 patients who presented at the Orthopaedics Outpatient Clinic during the equivalent period before the pandemic (September 1, 2019, -March 1, 2020). Patients were excluded from the study if they only attended the clinic for a follow-up examination (n=145), if medical records were not available (n=108), or if they did not wish to participate in the study (n=43) (Figure 1). After providing detailed information, an informed consent form was obtained from the patients before participating in the study. If the patient was under 18, consent was obtained from the patient's parents.

The ICD-10 codes of the patients were analyzed according to the reasons for admission, and they were grouped as trauma, sports medicine (knee-shoulder), pediatrics, foot and ankle, hand surgery, and spine. Patient data were obtained from the hospital electronic medical records, including demographic characteristics (age, gender), reasons for admission, duration of

complaints, treatments applied, and compliance with treatment before and after the pandemic. To minimize errors, the findings were evaluated by two researchers.

The duration of complaints of the patients was separated into three groups of 0-21 days (acute), 21-180 days (subacute), and >180 days (chronic). The treatments recommended to the patients (conservative, observation alone, or surgery) and patient choices were compared before and after the COVID-19 pandemic. The surgical acceptance rate of patients after the pandemic was also examined.

### Statistical Analysis

Data obtained in the study were analyzed statistically using SPSS v.22 software (IBM Corp., Armonk, NY, USA) and at a confidence interval of 95%. Qualitative data were stated as frequency distribution, and quantitative data were as mean minimum, and maximum values. Inter-observer and intra-observer reliability was assessed using the interclass coefficient. Demographic data were evaluated with the Mann-Whitney U-test. To determine whether there was a difference between the categories of qualitative variables with more than two categories in terms of a quantitative variable, the One-Way ANOVA test was used if the standard distribution assumptions were met, and if not, the Kruskal-Wallis H test was used. A Chi-square test was applied to examine the relationship between two qualitative variables. The statistical significance level was taken as 0.05.

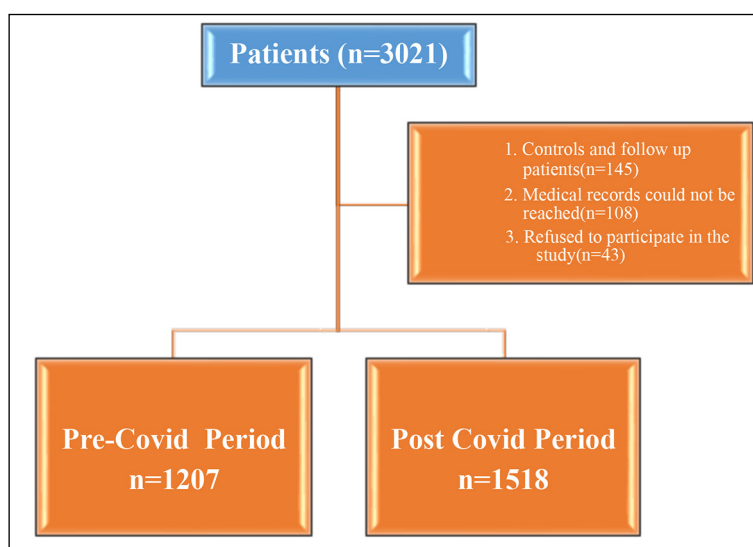


Figure 1. Patient flow chart.

**Table I.** Patient demographic data.

	Pre COVID	Post COVID
Patients	1207	1518
Age (Years)	39.1±20.8 (1-91)	38.1±20.6 (1-95)
Gender (Female/Male)	635/572	793/725
Admission time		
Acute (0-21 days)	685 (56.8%)	722 (47.6%)
Subacute (21-180 days)	228 (18.9%)	331 (21.8%)
Chronic(>180 days)	294 (24.4%)	465 (30.6%)

**Table II.** Reasons for presentation.

	Pre COVID	Post COVID
Patients	1207	1518
Trauma	245 (18.8%)	259 (17.1%)
Sports Medicine (Knee-Shoulder)	411 (31.5%)	616 (40.6%)
Pediatrics	83 (6.4%)	120 (7.9%)
Foot and Ankle	205 (15.7%)	144 (9.5%)
Hand Surgery	95 (7.3%)	165 (10.9%)
Spine	160 (12.3%)	195 (12.8%)
Oncology	10 (1%)	19 (1.3%)

**Table III.** Treatment recommendations.

	Pre COVID	Post COVID
Treatment recommendations		
Conservative	1076 (89.1%)	1281 (84.4%)
Surgery	72 (6%)	86 (5.7%)
Follow-up Only	32 (2.7%)	94 (6.2%)
Consultation Rate	27 (2.2%)	57 (3.8%)
Treatment Rejection	24/1207 (1.9%)	27/1518 (1.7%)
Surgical Acceptance Rate	48/72 (66.6%)	59/86 (68.6%)

## Results

The mean age in the pre-pandemic outpatient clinic admissions was 39.1 years (range, 1-91 years), and the female/male ratio was 635/572. During the COVID-19 pandemic, the mean age of the patients was 38.1 years (range, 1-95 years), and the sex ratio was 793/725 (F/M). No statistical difference was observed between the two periods in respect of age (39.1-38.1) and gender (52% F and 48% M) ( $p=0.138$ ,  $p=848$ ). Admissions of patients with acute complaints decreased during the pandemic, and presentations with subacute or chronic complaints increased. A significant difference was observed between the groups in the time from onset of symptoms to hospital admission (Table I).

When the reasons for admission were examined during the pandemic, there was an increase in sports medicine, pediatrics, and hand surgery, a decrease in

trauma, foot and ankle, presentations related to oncology and spine did not change. A statistically significant difference was observed in the presentation rates before and during the COVID-19 pandemic (Table II).

During the pandemic, there was observed to be a decrease in conservative treatment recommendations, no change in the surgical treatment recommendations, and an increase in the rate of patients for whom follow-up only was decided. There was no significant difference in the treatment rejection by patients and surgical acceptance rates during the pandemic compared to the pre-pandemic period ( $p=0.343$ ,  $p=0.556$ ) (Table III).

## Discussion

The coronavirus pandemic, which emerged in Wuhan, China, continues to affect the whole

world, including Turkey<sup>5,6,10</sup>. The mandatory restriction of elective health services, lockdowns, and public fear, especially at the beginning of the pandemic, also affected orthopedic outpatient services<sup>11</sup>. The results of this study showed that the time to presentation at hospital was prolonged by patients during the pandemic. There was seen to be hesitancy in making treatment decisions, and observation was preferred more than the other options. The increased number of consultations can also be considered a cautious approach.

A unique aspect of this study was that there were no COVID-19-positive hospitalized patients in our hospital during the study period. Therefore, the effect of the pandemic on patients could be observed more objectively, independent of the anxiety caused by the hospital conditions. A study in England determined that patients preferred private hospitals with low COVID-19 alert levels to hospitals with high COVID-19 alert levels. In this preference, severe pain, described as “worse than death,” was seen to have a significant effect<sup>7</sup>. In a study conducted in Romania, it was observed that the number of arthroplasty, arthroscopy, and trauma cases decreased, and patients preferred private hospitals rather than public hospitals<sup>12</sup>. In this process, the use of private hospitals has increased because more protective equipment can be supplied to patients, the appointments are longer, and technological applications such as telemedicine are used more widely. Although there could be a similar preference in Turkey, multi-center, long-term clinical studies are needed.

During the pandemic, sports medicine (knee and shoulder), pediatrics, and hand surgery cases increased, trauma, foot and ankle presentations decreased, and oncology and spine presentations were similar. In a study by Greenhalgh et al<sup>13</sup>, the number of trauma surgeries was determined to have decreased by 51% during the pandemic. In another study by Park et al<sup>14</sup> in a level 1 trauma center in London, it was observed that the number of trauma surgeries decreased by 37% compared to the pre-pandemic period. Studies<sup>15,16,17</sup> have also shown that the number of arthroscopy and arthroplasty cases decreased during periods of lockdown in Austria, Germany, Greece, and Switzerland. In a survey by Kort et al<sup>18</sup> investigating the effects of the pandemic among arthroplasty surgeons in Europe, it was observed that the number of arthroplasty and arthroplasty revisions decreased significantly. In the current study, it was also observed that the number of trauma cases decreased, but there was no decrease in ar-

throplasty and arthroscopy presentations, or surgical interventions compared to the pre-pandemic period. Based on these data, it can be argued that the pandemic did not affect the patient profile of private hospitals as much as public hospitals in Turkey.

One of the most critical findings of the current study was that the time from the onset of the complaints to hospital presentation was more extended than before the pandemic. A previous study<sup>19</sup> found a delay in presentations of spinal tumor and tuberculosis cases during the pandemic, resulting in a poor prognosis. In a survey conducted in Louisiana, USA, 90.7% of surgeons stated that there was a decrease in the number of patients, and 68% stated that there were delays in seeking care<sup>20</sup>. This situation, which was also encountered in the current study with similar results, is expected to lead to delays in diagnosis and treatment and poor clinical outcomes.

This study had several limitations, primarily that it was a single-center study with a short follow-up period. Second, clinical follow-up and outcomes were not included in the study. A third limitation was that it was impossible to evaluate the relationship between the lockdowns and the outpatient clinic presentations, as the lockdowns in Turkey were intermittent rather than continuous.

## Conclusions

It was observed that patients had a longer duration of complaints and there were fewer trauma-related outpatient clinic presentations. While making the treatment decision, the follow-up option was preferred rather than any conservative or surgical intervention. A delay in treatment can have serious consequences, so patients should be informed that all the necessary pandemic precautions have been taken and they should not delay their treatment.

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### Conflict of Interest

The Authors declare that they have no conflict of interests.

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### Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.



### Authors' Contribution

M. Ozdemir and Y.U. Yaradılmış designed the study, M. Ozdemir and B. Birinci collected the data, and M. Ozdemir, B. Birinci, and Y. U. Yaradılmış analyzed the data and wrote the manuscript. O. Oztürk and A.S. Targal contributed to the study design and wrote the manuscript. All authors read and approved the final manuscript.

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### Ethics Approval

Ethics Committee approval was released from Ankara Yuksek Ihtisas University. Date 13.01.2022 and number 2022/01/01.

### Informed Consent

An informed consent form was obtained from the patients before participating in the study.

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