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A comparative analysis of the COVID-19 pandemic response: The case of Turkey

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ABSTRACT

OBJECTIVE: COVID-19 has spread worldwide and leads to an increased risk of mortality. We aimed to analyze what actions have been effective in fighting COVID-19 in Turkey with a comparison to pandemic-affected countries.

METHODS: This was a retrospective observational cross-sectional study. The Republic of Turkey Ministry of Health official web page includes data reported daily from 11 March to 26 April. Global COVID-19 data were recorded daily from https://www.worldometers.info/coronavirus/country/. Data were analyzed for 31 days according to Intensive Care Unit (ICU) admission, intubation and mortality rates. Segmented regression analysis was used. The results from COVID-19-affected countries were compared with the results from Turkey for the first 65 days.

RESULTS: In total, 889.742 tests were performed (positive=110.130 [12.37%]). The mortality rate was 2.55% (n=2805) on 27 April 2020. The annual percent change (APC) values of the cases showed 5 segments ([23.1], [14.7] [11.4], [3.7], [0.7]; each p=0.001). ICU admission showed 4 segments (APC: [3.1, p=0.001], [-2.2, p=0.10], [-7.6, p=0.001], [-4.5, p=0.001]). The decline of APC for intubation rates showed 5 segments (APC: [1.1, p=0.10], [-1.1,p=0.001], [-2.0, p=0.001], [-0.4, p=0.40], [-2.7, p=0.001]). The mortality rates showed 4 segments (APC: [-6.3, p=0.001], [8.4, p=0.001], [0.2, p=0.30], [1.4, p=0.001]). Deaths were reported per 1 million individuals for the first 65 days: Spain 11.6%, Italy 11.4%, UK 11.3%, France 11.1%, USA 10.3%, Germany 8.4%, Iran 8.2%, Turkey 7.5%, South Korea 4.1% and China 2.4%.

CONCLUSION: Public health policies and protocols to combat COVID-19 helped control the spread and decrease positive cases and mortality rates in Turkey. Turkey managed COVID-19 better than Spain, Italy, UK, France, USA and Turkey managed COVID-19 similarly to Germany and Iran. China and South Korea were best at managing COVID-19.

Keywords: Covid-19; intubation rate; mortality rate; public health policies; Turkey.

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Coronavirus disease 2019 was first observed and reported in Wuhan, China, during the second week of December 2019 [1, 2]. The number of COVID-19 cases in China has gradually decreased after two months from the first case [3]. The World Health Organization (WHO) announced a "Public Health Emergency of Inter-

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national Concern" on 30 January 2020 and then declared a pandemic on 10 March 2020 [4]. COVID-19 has spread though European countries such as Italy, Spain, Germany and England. Each country has planned its own combat strategy with the COVID-19 pandemic. The incubation period range of COVID-19 was 1 to 14 days, with a median of 5–6 days [5, 6]. The Infectious Diseases Society of America (IDSA) reported the guidelines for supporting physicians regarding treatment options for the COVID-19 at the end of April 2020 [7]. The guidelines have concerns about the low evidence of studies, and they recommend hydroxychloroquine/chloroquine with/without azithromycin, with the term "knowledge gap" [7]. In addition to medical treatment, health policy has a coronavirus combat program to plan for decreasing thresholds for infected cases by school closure and quarantine programs [8].

COVID-19 has still spread worldwide and leads to rapid progression and an increased risk of mortality among intubated intensive care patients [9, 10]. Each country has its own policy and applies different medical approaches. In Turkey, the first COVID-19 case was diagnosed on 11 March 2020, after which the number of COVID-19 cases was tremendously increased. After 11 March, the Republic of Turkey Ministry of Health began acknowledging the daily COVID-19 results in multimedia [11]. This study aimed to analyze what actions make a difference in effectively combatting COVID-19 in Turkey based on healthcare policy and with a comparison to pandemic countries (United States of America, Germany, China, France, South Korea, United Kingdom, Iran, Spain, and Italy) around the world.

MATERIALS AND METHODS

The study was approved by the local ethical committee and Istanbul Ministry of Health (Date/number: 27.04.2020/116.2017.149). The study was performed in accordance with the Declaration of Helsinki. As informed consent from patients to review their medical records was not obtained, patient data were deidentified, and no patient ID was obtained. The study was designed as a retrospective observational cross-sectional study.

Data Collection

The Republic of Turkey Ministry of Health official web page (https://covid19.saglik.gov.tr/) [11] provides daily reporting data to the public, and the reported data include the total number of coronavirus-specific PCR tests performed, the total number of cases in which the PCR test revealed positive results, the total number of intubated patients in the intensive care unit (ICU), the total number of cured patients and the total number of nonsurvivors. These data were recorded daily from 11 March (first diagnosed COVID-19 case in Turkey) to 27 April. The data from counties with COVID-19 around the world were recorded daily from world COVID-19 data from the https://www.worldometers.info/coronavirus/ and https://www.who.int/emergencies/diseases/novel-coronavirus-2019 web addresses [12, 13]. National major implementation of the new coronavirus measures was recorded and summarized in Table 1 [14]. International rapid response measures were recorded and are summarized in Table 1 [15].

Statistical Analysis

The Joinpoint Regression Program, version 4.8.0 [16], was used for time trend analysis by applying segmented regression analysis. Turkish data were analyzed between 27 March 2020 and 26 April 2020 for 31 days. ICU admissions, intubation rates, positive case numbers and mortality rates were considered dependent variables, and days were considered independent variables. Logarithmic transformation was applied to all dependent variables. The grid search method was used to find the best possible fit for parameter estimates, and the permutation test was performed to determine the number of joints. Furthermore, parallelisms of trend data whose mean functions are represented by joinpoint regression were compared for the first 65 days of the pandemic between Turkey and other countries. The average annual percent change (AAPC) and 95% CIs were calculated for each segment to evaluate the direction and effect size of the trend. A P value<0.05 was considered statistically significant.

RESULTS

After the 1st case, in the study period, 889.742 tests were performed. The number of positive polymerase chain reaction (PCR) tests for acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was 110.130 (12.37%). The total number of mortalities among PCR-positive COVID-19 patients was 2805 (2.55%).

A segmented regression analysis graph for the ICU admission rate is shown in Figure 1. Four different segments were observed for changes in the ICU rate over 31 days. The results of the trend analysis for admission to the ICU are given in Table 2. There was a slow in-

TABLE 1. Major actions of rapid combat against COVID-19 in Turkey

No	Date	Measures
1	10 January 2020	Scientific Board for COVID-19 began continuous work
2	22 January 2020	COVID-19 Risk Assessment: "COVID-19 Guideline and Case Report, COVID-19 Disease Guideline"
3	February 2020	Restrictions were placed • on travel applied to regions with a high number of cases • on country border crossings
4	10 March 2020	The National Coordination Board held its first meeting
5	11 March 2020	First COVID-19 cases
6	16 March 2020	Education was suspended at schools and universities, and online-distance education became available
7	20 March 2020	All kinds of scientific, cultural, artistic and similar meetings or activities to be held in open and closed areas at the national and international levels were postponed
8	21 March 2020	• A curfew was imposed for those over the age of 65 years and those with chronic disease • Restrictions were implemented on the number of passengers (50% of capacity) in public transport, working hours, and allowed number of customers in markets. • Seating areas in all restaurants, patisseries and similar workplaces were removed, and only takeaway service was allowed. • The activities of barbershops, beauty salons/centers, hairdressers, etc., were suspended. • Flexible working timetables and working from home-office were implemented to decrease close contacts between employees
9	23 March 2020	Updated national guideline for COVID-19 treatment [16]
10	26 March 2020	Updated version of the national guideline for COVID-19 treatment [17]
11	3 April 2020	A curfew was imposed for those under the age of 20 years
12	9 April 2020	Curfews and quarantine measures were implemented on each weekend for the same provinces, with an exception for health care workers and security workers

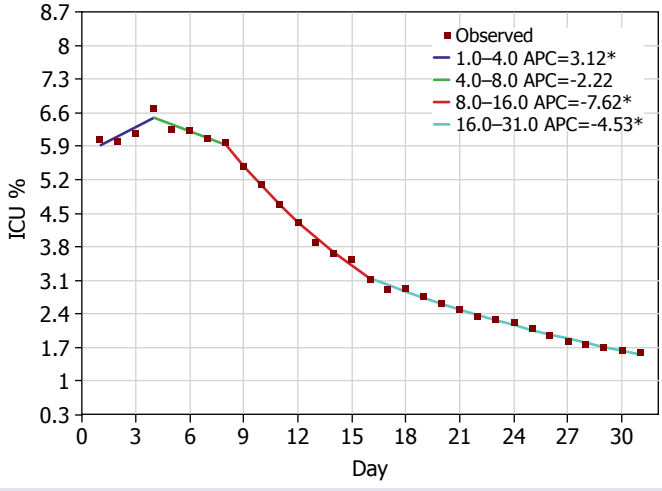

FIGURE 1. Joinpoints for changes in ICU admissions.

*Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha=0.05 level. Final selected model: 3 joinpoints.

crease in the first 4 days (APC=3.12, p=0.001), and the ICU admission rate started to decrease between 4 and 8 days (APC=-2.22, p=0.095). However, the decrease was not significant, and a rapid decrease was observed between the 8th and 16th days. The daily decline was 7.62% (p=0.001) for this segment, and finally, a significant decline continued, at 4.5% between the 16th and 31st days. For the full range, the average daily percent decrease was -4.3 (95% CI=-4.8–-3.9, p=0.001).

A segmented regression analysis graph for the intubation rate among ICU patients is shown in Figure 2. Five different segments were observed for changes in the intubation rate among patients admitted to the intensive care unit over 31 days. The results of trend analysis for changes in the intubation rate among ICU patients are shown in Table 3. There was no significant decrease in the first 5 days (APC=1.1, p=0.100), and the intu-

Table 2. Results of trend analysis for admission to the ICU

Segment	Lower-upper endpoints	APC	95% CI for APC	Prob> |t|
1	1–4	3.1*	0.4–5.9	0.001*
2	4–8	-2.2	-4.8–-0.4	0.095
3	8–16	-7.6*	-8.3–-7	0.001*
4	16–31	-4.5*	-4.8–-4.3	0.001*

*Significant at the 0.05 level. APC: Average annual percent change (AAPC); CI: Confidence interval.

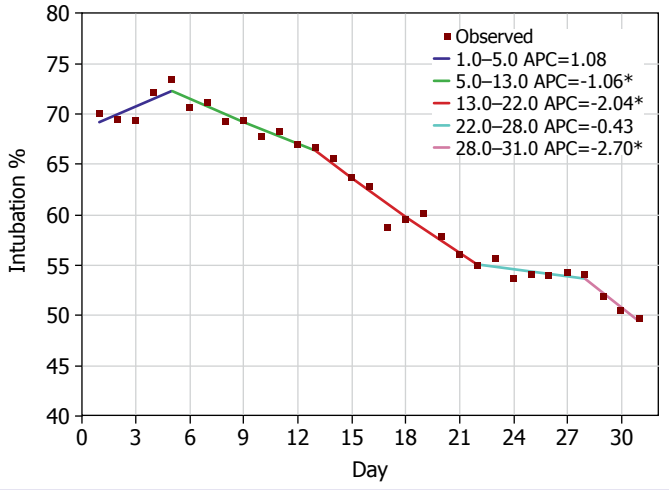

Figure 2. Joinpoints for changes in the intubation rate among ICU patients.

*Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha=0.05 level. Final selected model: 4 joinpoints.

bation rate started to decrease between days 5 and 13 (APC=-1.1, p=0.001). The decline in the intubation rate continued, with APC=2 between the 13th and 22nd days. No significant decline was observed in the 4th segment. Finally, the significant decline continued, at 2.7% between the 28th and 31st days. For the full range, the average daily percent decrease was -1.1 (95% CI=-1.5–-0.7, p=0.001).

A segmented regression analysis graph for positive case numbers is shown in Figure 3. Six different segments were observed for changes in the positive case number for 31 days. The results of trend analysis for positive case numbers are shown in Table 4. The APC value for the first 5 days was 23.1 and was 14.7 for 5 to 9 days. The APC decreased to 11.4 between 9 and 16 days. The

Table 3. Results of trend analysis for the intubation rate among ICU patients

Segment	Lower-upper endpoints	APC	95% CI for APC	Prob> |t|
1	1–5	1.1	-0.4–2.5	0.100
2	5–13	-1.1*	-1.7–-0.5	0.001*
3	13–22	-2.0*	-2.5–-1.6	0.001*
4	23–28	-0.4	-1.4–0.6	0.400
5	28–31	-2.7*	-4.9–-0.5	0.001*

*Significant at the 0.05 level. APC: Average annual percent change (AAPC); CI: Confidence interval.

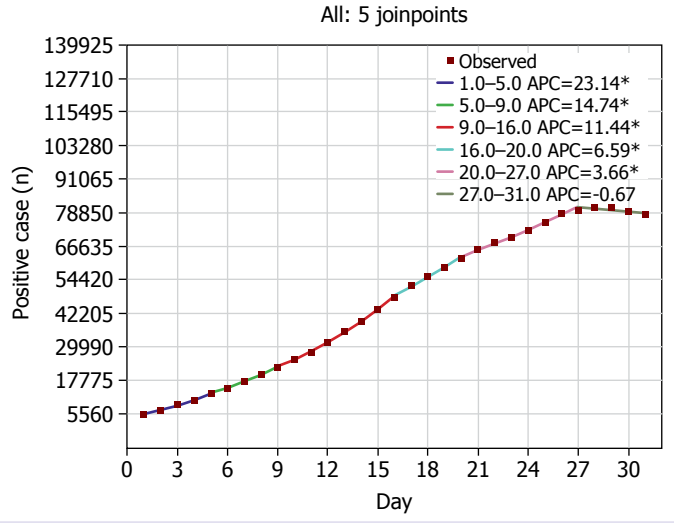

Figure 3. Joinpoints for changes in the positive case number.

*Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha=0.05 level. Final selected model: 5 joinpoints.

Table 4. Results of trend analysis for positive case numbers

Segment	Lower-upper endpoints	APC	95% CI for APC	Prob> |t|
1	1–5	23.1*	21.4–24.9	0.001*
2	5–9	14.7*	12.2–17.4	0.001*
3	9–16	11.4*	10.6–12.3	0.001*
4	16–20	6.6*	4.2–9.0	0.001*
5	20–27	3.7*	2.9–4.5	0.001*
6	27–31	-0.7*	-2.1–0.8	0.300

*Significant at the 0.05 level. APC: Average annual percent change (AAPC); CI: Confidence interval.

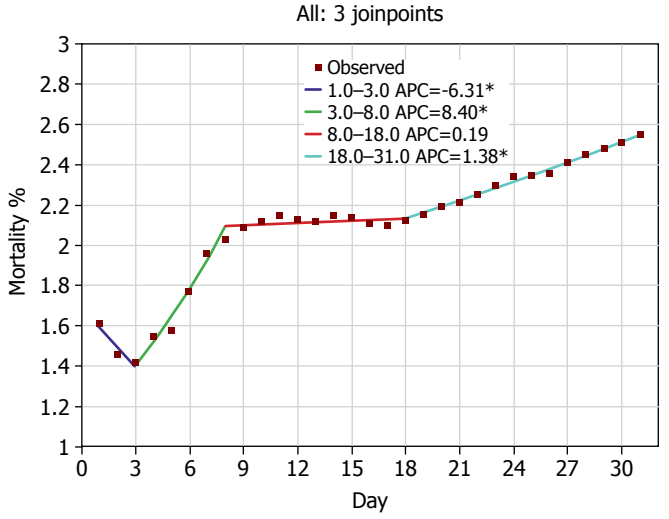

Figure 4. Joinpoints for changes in the mortality rate.

*Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha=0.05 level. Final selected model: 3 joinpoints.

APC for between the 20th and 27th days reached 3.7. In the last segment, no significant decrease was observed. For the full range, the average daily percent increase was 9.1 (95% CI=8.6–9.7, p=0.001).

A segmented regression analysis graph for the mortality rate is shown in Figure 4. Four different segments were observed for changes in the mortality rate over 31 days. The results of trend analysis for the mortality rate are shown in Table 5. There was a significant decrease in the mortality rate between the 1st and the 3rd days (APC=-6.3, p=0.001). A rapid increase was observed between the 3rd and 8th days, with an APC value of 8.4. The mortality rate remained stable for the time interval of the 8th to 18th days, and the APC decreased to 1.4 between the 18th and 31st days. For the full range, the average daily percent increase was 1.6 (95% CI=1.2–1.9, p=0.001).

Table 5. Results of trend analysis for the mortality rate

Segment	Lower-upper endpoints	APC	95% CI for APC	Prob> |t|
1	1–3	-6.3*	-9.8–-2.7	0.001*
2	3–8	8.4*	7.1–9.7	0.001*
3	8–18	0.2	-0.2–0.5	0.300*
4	18–31	1.4*	1.2–1.6	0.001*

*Significant at the 0.05 level. APC: Average annual percent change (AAPC); CI: Confidence interval.

Comparison of Turkey and Other COVID-19-affected Countries

Daily increases in the number of deaths and cases were compared between Turkey and 9 other countries. The starting date for analysis was defined for each country when they reported 1% of cases per 1 million population. The daily increase in AAPC was highest for Spain (14.0%) and the United States of America (13.7%) for reported cases per 1 million population and lowest for China (5.0%) for the first 65 days of the pandemic. The increase in new cases in Turkey was similar to that in Germany, France, the United Kingdom and Italy, but it was significantly higher than that in China, South Korea and Iran (Table 6).

Table 6. Estimated AAPCs for the number of cases reported per 1 million population for first 65 days of the pandemic and a comparison of Turkey and other countries

Cohort	AAPC [95% CI]	AAPC difference [95% CI]	p
Turkey	12.6 [12.0–13.1]	Reference	
United States of America	13.7 [13.3–14.2]	1.1 [0.4–1.9]	0.001*
Germany	12.6 [11.9–13.3]	0 [-0.8–0.9]	0.900
China	5 [4–6]	-7.6 [-8.7–-6.4]	0.001*
France	13.1 [12.4–13.7]	0.5 [-0.4–1.3]	0.300
South Korea	8.8 [8.5–9.2]	-3.7 [-4.4–-3.1]	0.001*
United Kingdom	12.7 [11.8–13.6]	0.1 [-0.9–1.2]	0.800
Iran	11.4 [11.1–11.8]	-1.2 [-1.8–-0.5]	0.001*
Spain	14.0 [13.4–14.6]	1.4 [0.6–2.2]	0.001*
Italy	12.9 [12.3–13.6]	0.4 [-0.5–1.2]	0.400

*Significant at the 0.05 level. AAPC: Average annual percent change; CI: Confidence interval.

Table 7. Estimated AAPCs for the number of deaths reported per 1 million population for first 65 days of the pandemic and a comparison of Turkey and other countries

Cohort	AAPC [95% CI]	AAPC difference [95% CI]	p
Turkey	7.5 [6.9–10.9]	Reference	
United States of America	10.3 [9.7–10.9]	2.8 [1.9–3.7]	0.001*
Germany	8.4 [7.8–9.1]	0.9 [-0.1–1.8]	0.100
China	2.4 [0.9–4.0]	-5.1 [-6.8–-3.4]	0.001*
France	11.1 [10.3–11.9]	3.5 [2.5–4.6]	0.001*
South Korea	4.1 [2.1–6.2]	-3.4 [-5.6–-1.3]	0.001*
United Kingdom	11.3 [10.8–11.9]	3.8 [2.9–4.6]	0.001*
Iran	8.2 [7.6–8.8]	0.6 [-0.2–1.5]	0.100
Spain	11.6[10.9–12.2]	4 [3.1–5]	0.001*
Italy	11.4 [10.8–11.9]	3.8 [2.9–4.7]	0.001*

*Significant at the 0.05 level. AAPC: Average annual percent change; CI: Confidence interval.

Table 8. Number of tests per 1000 people and one case

Cohort (24 May 2020)	Test numbers per 1000 people	Total test numbers/total case numbers
Spain	76.07	12.57
Italy	57.00	15.00
United Kingdom	50.97	13.33
United States of America	44.37	8.72
Germany	42.92	19.94
Turkey	21.75	11.68
France	21.21	7.58
South Korea	16.00	73.31
Iran	9.54	5.90
China	No data	No data

The daily increase in AAPC was highest for Spain (11.6%) and Italy (11.4%) for the number of deaths reported per 1 million population and lowest for China (2.4%) for the first 65 days of the pandemic. The increase in deaths in Turkey was similar to that in Germany and Iran and lower than that in Spain, Italy, United Kingdom, France, and the United States of America, but it was significantly higher than that in South Korea and China (Table 7).

Table 8 shows the test numbers as of 24 May 2020. The data from China were not available online. Spain, Italy, and the United Kingdom were the three countries with the highest number of tests. South Korea has performed approximately 73 tests per 1 positive case (Table 8).

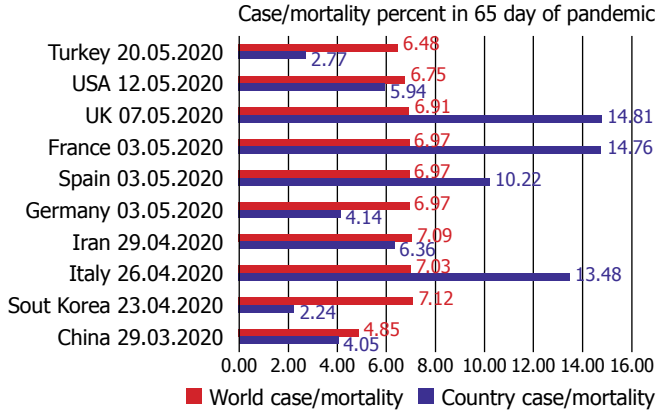

Figure 5. COVID-19 cases and mortality rates in different countries on the 65th day of the pandemic.

Figure 5 shows COVID-19 cases and mortality rates in different countries on the 65th day of the pandemic. On the 65th day, South Korea, Turkey, China, and Germany had the lowest morality rates and the United States of America, France, Italy, and Spain had the highest mortality rates. Worldwide mortality rates ranged from 4.85% to 7.12% from April to May, 2020.

DISCUSSION

In the present study, COVID-19 in Turkey progressed from 11 March through 27 April 2020. National restriction policies, such as school closure (16 March), curfew for those over the age of 65 years (21 March 2020) and under 20 years (3 April 2020) and curfews and quaran-

tine (11 April) during the weekend, led to a decrease in the number of positive cases after 23 April 2020. ICU demand decreased significantly after the 1st week of applying national treatment guidelines (23rd March 2020) when PCR-positive cases increased. The average annual percent changes in mortality rate dramatically increased at the 3rd week, reached a steady state at the 4th week, and again increased to a 6-times lower AAPC compared to the previous increase. Flattening of the curve was observed on 23 April (7th week after the first cases). Turkey was compared with other countries that were affected by the 2019 novel coronavirus, and had a better mortality rate than Italy, Spain, the United States of America, the United Kingdom, France and Iran. Turkey had a mortality rate similar to that of Germany. China and South Korea had significantly less mortality than Turkey in the first 65 days of the pandemic.

COVID-19 Case Numbers and Mortality in First 65 Days: Turkey, the United States of America, Germany, China, France, South Korea, the United Kingdom, Iran, Spain, and Italy

As of 24 May 2020, Spain, Italy and the United Kingdom have performed the highest numbers of tests per 1000 people in their countries (Table 8). Among the tested people, COVID-19 was most prevalent in South Korea, Germany and Italy (Table 8). Turkey had nearly 1/4 of the tests compared with the number performed in Spain and 1/3 compared with the number performed in Italy and the United Kingdom. South Korea had nearly ¾ of the number of tested people compared with that in Turkey; however, the case ratio was nearly 6.3 times higher in South Korea (Table 8). This result could be explained by the fact that testing was performed when subjects were highly suspected for COVID-19. In the present study, the average annual percent change in cases as the starting date for analysis was defined for each country when it reported 1 case per 1 million population for Turkey and other pandemic-affected countries (the United States of America, Germany, China, France, South Korea, the United Kingdom, Iran, Spain and Italy) over 65 days of the pandemic. Turkey had a higher percent of COVID-19 cases than China and South Korea in the first 65 days (Table 6). Turkey had a similar percentage of cases as that in Germany, France, Italy and the United States of America for percent of cases reported per 1 million population for the first 65 days of the pandemic (Table 6). Turkey showed better control of spreading than Spain and the United States of America, which is shown in Table 6.

The lowest deaths rates were in China, South Korea and Turkey in the first 65 days (Table 7). The estimated average annual percent change for the number of deaths reported per 1 million population for the first 65 days of the pandemic in Turkey showed significantly fewer deaths than that in Spain, Italy, the United Kingdom, France, and the United States of America (Table 7). China had the lowest mortality rate among the study countries. After China, South Korea had the second lowest mortality rate. Turkey showed a lower mortality rate, even though the number of cases was similar to that in France and Italy. The present study showed that on the 65th day of the pandemic, the worldwide mortality rate was nearly 6% to 7%, while the rates in Turkey and South Korea were nearly half that of the worldwide rate (Fig. 5). China, Germany and the United States of America showed also showed lower mortality rates compared with the worldwide rate (Fig. 5). The United Kingdom, France, Italy and Spain had nearly twice the mortality rates compared with the worldwide rate. Turkey's success could be explained by free health care-drug support, rapid national COVID-19 management guidelines and the curfew for those over the age of 65 years and those with chronic disease [17, 18].

Rapid Combat Measures for COVID-19 in Turkey, the United States of America, Germany, China, France, South Korea, the United Kingdom, Iran, Spain, and Italy

Government responses to the COVID-19 pandemic first started with restrictions on international movement, except in Japan and Singapore; public information campaigns (all COVID-19-affected countries); public event cancellation (except Japan); school closure (except Japan); public transport closure (only China, France, and Turkey); workplace closure (except Turkey, Germany, and Japan); restrictions on people over 65 years old and under 20 years old (Turkey); strict quarantine (China, Germany, and Italy); and implementation of curfew for all citizens on the weekend (Turkey) [14, 15]. These implementations helped control the spreading pandemic. Orders to obey social distancing use face masks, quarantine and curfews were not the same among the pandemic-affected countries. National and international scientific, cultural, and artistic meetings or activities to be held in open and closed areas were postponed in many countries. The Mediterranean countries, including Italy and Spain, did not employ all the major implementations at first; for example, sporting events and picnicking and outdoor ac-

tivities could cause COVID-19 to spread in those with chronic disease and the elderly population. In the present study, the mortality rates of Italy, Spain and France were higher than those of Turkey (Table 7). China followed all strict combat implementations, and the mortality rate was significantly lower than that of all other study countries.

Treatment and Management of Patients with COVID-19 in Turkey, the United States of America, Germany, China, France, South Korea, the United Kingdom, Iran, Spain, and Italy

The Turkish National Guideline of COVID-19 supports physicians in selecting drugs for patients with COVID-19 [11]. The national guidelines were updated every two-three days based on new worldwide experience literature. Hydroxychloroquine (HCQ) is given to COVID-19 cases who are PCR positive with 2019 novel coronavirus or typical COVID-19 findings on thoracic computerized tomography at a hospital under physician control (23 March 2020), and then those patients are discharged for home isolation if noncomplicated with HCQ treatment for a total of 5 days; sometimes, azithromycin was added to treatment when simple pneumonia was present after 26 March 2020. The Turkish government freely supplies all COVID-19-specific drugs to COVID-19 patients and suspected patients. Primary care centers visit all affiliated people and control the health situation and their drugs either face to face or by phone. In the present study, the free drug supply (initiated on 26 March 2020) could be one of the reasons for the decreasing ICU demand after 2 April 2020 (Fig. 1). In addition to decreasing ICU demand, the severity of critically ill COVID-19 patients decreased after 2 April 2020 and continued through the end of the study period (26 April 2020) (Fig. 2). These significant decreasing curves could be explained by the national treatment approach throughout the pandemic area. The national COVID-19 treatment policy was accepted and applied all over the COVID-19 Pandemic Hospital and Primary Care Center filiation program. The Infectious Diseases Society of America released a rapid guideline to support the treatment and management of patients with COVID-19 on 27 April 2020 [7]. HCQ is a famous drug after the COVID-19 pandemic, and it is recommended to hospitalize patients with COVID-19 in the context of a clinical trial in terms of the "knowledge gap" to avoid premature favorable recommendations for potentially ineffective or harmful interventions [7]. The IDSA also recommended HCQ plus azithromycin with the same precautions (knowledge gap) on 27 April 2020 [7, 19–21]. The Turkey National COVID-19 Management Guideline has been recommended to physicians since 23 March 2020 [16]. Turkey has used HCQ and azithromycin precautions since 23 March 2020 and continues using these drugs with physicians' control [18].

Intensive Care Unit Demand and Rate of Intubation

In the present study, when positive PCR testing for 2019 novel coronavirus was increased, the demand for ICUs and the need for intubation decreased (Fig. 1, 3). The national COVID-19 guideline [11] followed the recommendations of China and other Asian countries; Turkey started to use HCQ and azithromycin 14 days after the first COVID-19 case at all centers without charge, and reasonably early administration of these drugs could be effective in preventing progression of pulmonary complaints, such as acute respiratory distress syndrome (ARDS). Current data revealed some promising results that the COVID-19 patients treated with HCQ and azithromycin showed less radiologic progression with acceptable safety results than those that received conventional treatment [19]. Furthermore, patients with COVID-19 using HCQ and azithromycin could have a lower rate of intubation for invasive mechanical ventilation. The Food and Drugs Administration approved HCQ and tocilizumab (IL-6 inhibitor), which may be used off-label [22].

In conclusion, the number of COVID-19 cases in Turkey increased rapidly; however, the implementation of national rapid combat measures, such as travel restrictions, contact tracing by primary health care workers, quarantine of exposed individuals, curfews and social-physical distancing, may have led to a slower rate. The COVID-19 pandemic is a worldwide problem, and the discovery and application of solutions vary according to national priorities. China, South Korea and Turkey were the first three successful COVID-19-combatting countries according to the number of deaths reported per 1 million population for the first 65 days of the pandemic. Turkey COVID-19 guideline regimens, including use of HCQ with/without azithromycin, might be the reason for the decreasing ICU demand and the rate of intubation for patients with COVID-19 in Turkey. It should be kept in mind that COVID-19 control and spreading prevention programs must be unique because humans are fighting the same virus, and this is not a world war among countries; this is a worldwide war against one enemy, SARS CoV-2.

Limitations of the Study

There are some limitations to this study. First, the study data have been produced with the Ministry Data System records, and there may be a small number of patients who do not apply to the hospital and do not enter the registration system. Second, data and interpretations reflect the dates on which they were obtained. Our results may not explain unforeseen changes and results in the course of the disease in the future. Last, since data were recorded without patients' demographics and comorbidities, our results cannot specify any comorbid diseases.

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