RESEARCH ARTICLE

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Treatment Cost Analysis of COVID-19 in patients Treated at a University Hospital in Turkey

ABSTRACT

Objective: To guide both the hospital management and the health policymakers who play a role in the management process of their disease by analysing the costs of the patients receiving inpatient treatment in Düzce University Health Application and Research Center (Hospital - DUHARH) due to coronavirus disease 2019 (COVID-19) from the perspective of the Social Security Institution (SSI).

Methods: The study covers 582 patients who received inpatient treatment in intensive care and other clinics in March/2020-December/2020 due to COVID-19 disease in DUHARH. In the study, all sample unselected populations were included. Retrospectively obtained data were analysed using bottom-up, document analysis, and multivariate regression analysis.

Results: It was determined that 60% of the 582 patients studied were male (350 people), 40% female (232 people) and that the average hospitalization period was 5.7 days, 23% (134 people) in the Pandemic Intensive Care Unit and 77% (448 people) in other pandemic services. The total amount invoiced to SSI by the hospital was 7.378.695,00 TRY ($ 1,052,595). It was determined that 79% of this was the intervention cost and the average daily hospitalization cost per patient was ± 2,099.80 TRY ($ 299.54). Besides, since gender discrimination is male, elderly patients are hospitalized in intensive care. The hospitalization period is P<0.05. It was observed that medicine, material, intervention, and examination costs have increased.

Conclusions: In the study conducted, it was observed that the increase in men, age and hospitalization period, and treatment in intensive care increased the costs, and among these, the intervention costs were the highest. To reduce the cost of illness, it is necessary to use lower-cost factors to eliminate the disease rate with restrictions and ultimately to vaccinate the whole population as soon as possible.

Keywords: COVID-19, Cost of Illness, Cost of Treatment, Cost Management.

Türkiye'deki Bir Üniversite Hastanesinde Yatarak Tedavi Edilen COVID-19 Hastalarının Tedavi Maliyet Analizi

ÖZET

Amaç: Coronavirus Hastalığı-2019 (COVID-19) nedeniyle Düzce Üniversitesi Sağlık Uygulama ve Araştırma Merkezinde (Hastanesinde- DUHARH) yatarak tedavi gören hastaların Sosyal Güvenlik Kurumu (SGK) perspektifi açısından maliyet analizini yaparak hem hastane yönetimine hem de hastalığın yönetim sürecinde rol oynayan sağlık politikası yapıcılarına yol göstermektir.

Gereç ve Yöntem: Araştırma, DUHARH'da COVID-19 hastalığı nedeniyle yoğun bakım ve diğer kliniklerde Mart/2020-Aralık/2020 dönemi içerisinde yatarak tedavi edilen 582 hastayı kapsamaktadır. Araştırmada örneklem seçilmemiş evrenin tamamı çalışmaya dahil edilmiştir. Retrospektif olarak elde edilen veriler, aşağıdan yukarı, doküman analizi ve çok değişkenli regresyon analiz yönetimiyle analiz edilmiştir.

Bulgular: Araştırma yapılan 582 hastanın %60'ı erkek (350 kişi), %40 kadın (232 kişi), ortalama yatış süresi 5,7 gün, Pandemi Yoğun Bakım Ünitesinde %23 (134 kişi) diğer pandemi servislerinde %77 (448 kişi) olduğu tespit edilmiştir. Hastane tarafından SSI'ya fatura edilen toplam tutar 7.378.695,00 TL ($1,052,595) olup bunun %79'nun müdahale maliyeti olduğu ve hasta başı günlük ortalama yatış maliyetin ± 2.099,80 TL ($ 299,54) olduğu saptanmıştır. Ayrıca cinsiyet ayrımının (erkeklerin), yaşlı hastaların, yatış yerinin (yoğun bakım) ve yatış süresi P<0.05 olduğundan ilaç, malzeme, müdahale ve tetkik maliyetlerini artırdığı tespit edilmiştir.

Sonuç: Yapılan çalışmada erkeklerin, yaşın ve yatış süresinin artması ve yoğun bakımda tedavi edilmenin maliyetleri artırdığı ve bunlar içerisinde en yüksek müdahale maliyetlerinin olduğu tespit edilmiştir. Hastalık maliyetinin azaltılması için daha düşük bedelli maliyet unsurlarına başvurulması, kısıtlamalarla hastalığın bulaş hızının ortadan kaldırılması ve nihayetinde tüm halkın bir an önce aşılanması gerekir.

Anahtar Kelimeler: COVID-19, Hastalık Maliyeti, Tedavi Maliyeti, Maliyet Yönetimi.

INTRODUCTION

An unknown cause of pneumonia was detected on December 31, 2019, in Wuhan city of Hubey province of China, and it was reported to the World Health Organization (WHO). Then, on January 5, 2020, the WHO named this new disease an epidemic (1). This virus, which has spread to many countries since its first appearance, was officially reported in Turkye on March 11, 2020 (2). Of even date, the WHO announced that the new type of coronavirus is a pandemic (1). As of this date, countries worldwide have had to take a series of drastic control measures, such as travel restrictions, closure of schools, universities, and workplaces, social distancing and quarantine, city, region, and country entry restrictions. The main purpose of these measures has been to reduce the rate at which the virus spreads until a vaccine, or effective treatment is found to alleviate the pressure on limited healthcare resources (3).

The most contagious time of the coronavirus, which can be transmitted directly (close contact) and indirectly (with environmental surfaces or equipment used by COVID-19 patients), is considered to be the time when the infected person is most symptomatic (4). The first symptoms of COVID-19 are usually dry cough, fatigue, muscle pain, dyspnea, and fever (5,6). While approximately 80% of patients have mild/moderate symptoms similar to cold or mild pneumonia, severe pneumonia requiring supplemental oxygen or invasive cardiopulmonary support may develop in 20% of patients (7). It is also among the findings that some patients with mild/moderate symptoms at the beginning progressed to severe pneumonia despite drug therapy (8). In case of detection of such findings, it requires treatment of COVID-19 patients through hospitalization (9). Therefore, the simultaneous hospitalization of many patients adversely affects the staff strength and capacity of hospitals and puts them in financial difficulties.

The treatment process of COVID-19 disease varies from person to person according to age, the severity of the disease, and comorbidity (8). Considering that this disease is an “epidemic” analysing the economic impact of COVID-19 treatment on healthcare institutions is gaining importance for governments to form constructive policies on the health economy. When the literature is reviewed, few studies aim to measure the direct medical costs of COVID-19. Khan et al. was evaluated survival according to age groups, gender, use of mechanical ventilators, nationality, and admission to the intensive care unit of hospitalized COVID-19 patients in the Kingdom of Saudi Arabia and measured the direct medical costs associated with hospitalization per patient (10). Jin et al. were analysed the health and societal cost of COVID-19 in 31 state-level administrative regions in China between January and March 2020 using a bottom-up approach (11). Li et al. was evaluated the affordability of treatment costs by comparing out-of-pocket expenses of COVID-19 patients in China by per capita disposable income (12). Gedik, as for that, was determined the cost of patients aged 18 and over who were diagnosed with COVID-19 between March 17 and May 11, 2020, at Taksim Training and Research Hospital in Turkey and treated for at least 24 hours (13). Besides, there are also studies investigating the economic, social, and communal effects (14,16) and labor and productivity losses (17,18) of the COVID-19 pandemic on countries.

In this study, treatment costs were analysed in terms of the SSI perspective of hospitalized patients for COVID-19 in DUHARH in Turkey. Medicine, medical equipment, intervention, and examination expenses were calculated as cost factors. However, the effects of patients’ age, gender, length of hospitalization, and treatment in pandemic intensive care unit and pandemic ward on cost factors were examined.

MATERIAL AND METHODS

Study Design: This study was conducted retrospectively in DUHARH. DUHARH is the only tertiary education and research hospital in the province where it is located and has 316 beds. According to the COVID-19 adult treatment algorithm (19) published by the Turkey Ministry of Health between March 11 and December 31, 2020, 582 hospitalized patients constitute the study sample. All COVID-19 patients of all ages and treated for at least 24 hours in all units were included in the study's scope.

All hospitalized patients gave informed consent before enrolment. This study was conducted with the Republic of Turkey Ministry of Health and Düzce University Non-Invasive Health Research Ethics Committee's approval.

Costs: Patients treated for COVID-19 disease in Turkey benefit from free health services under the General Health Insurance (GHI). Financing expenses arising from individuals with GHI's health care services are covered by a third party, the Social Security Institution (SSI). Within this scope, hospitals' expenses are collected from SSI. Price regulation applied in the collection process is provided by the Health Application Communiqué (HAC). HAC prices are a detailed pricing practice determined based on the transaction and package that SSI determines for certain services and pays to hospitals provided that they are duly invoiced. *In the study, these prices were calculated in Turkish Lira* and the Central Bank of Turkey's average exchange rate for 20*20 in $1 = 7.01 TRY.*

Retrospective data obtained through the hospital automation system was analysed with document analysis and a bottom-up approach. The bottom-up approach, one of the disease cost analysis approaches, is used to quantify each resource used to produce a service and calculate

total costs (20). In this approach, detailed activity data is used to estimate unit costs. Since it is assumed that resources will be addressed more comprehensively in a given service provider, more accurate results are obtained (21).

The purpose of the disease cost is to guide the decisions to be taken for the future by making use of past experiences. It is important to determine the perspective to be studied in the analysis process (28).

Treatment costs include all of the costs of COVID-19 and other related illnesses in pandemic intensive care and other pandemic wards hospitalized with the hospital's emergency unit. Within this scope, the invoice amount, including direct medical costs, consists of medicines, medical supplies, interventions, and examinations.

Medications include drugs such as Favipiravir, Hydroxychloroquine, Remdesivir, Azithromycin, Corticosteroids, Tocilizumab, Enoxaparin, Aspirin, non-steroidal anti-inflammatory drugs, various antibiotics, and serum treatments.

Medical supplies include blood glucose strip, cannula, three-way tap, drip adjustment set, cannula IV no: 22 (blue), surgeon glove, urine bag, an oxygen mask, patient diaper, overalls, mask, gloves, protective glasses, disinfectant, intravenous fluids, and other medical supplies.

Intervention includes factors such as oxygen inhalation therapy (hourly), glucose test (Bedside, glucometric), IV injection, Subcutaneous injection, oral, pandemic care service, intravenous drug infusion, standard bed fee, bedside visit, and respiratory support devices (high flow oxygen device, non-invasive and invasive mechanical ventilators).

Examinations include Potassium (Serum/Plasma), Creatinine (Serum/Plasma), Sodium (Serum/Plasma), Bun, Urea (Serum/Plasma), Chloride (Serum/Plasma), AST (Serum/Plasma), ALT (Serum/Plasma), CRP (Turbidimetric), Bt, thorax, posteroanterior chest X-ray P.A (one way), Covid-19 (SARS-CoV-2) Reverse Transcriptase PCR, Procalcitonin, D-dimer, quantitative, Ferritin (Serum/Plasma), Hemogram (Whole Blood).

Statistical Analysis: The study's statistical analyses were conducted with the EViews 10.0 (Quantitative Micro Software) econometric analysis program. Multivariate regression analysis was conducted in the study. There are coefficients calculated by the maximum likelihood method (OLS). When independent variables are two or more, multiple linear regression analysis is used. This analysis was examined by correlating the cost factors of hospitalized patients for COVID-19 with gender, age, hospitalization duration, and place. Accordingly, a p-value less than 0.05 was considered significant. The econometric model of the study is given below (22).

By generalizing the bivariate population regression function (PRF), the tri-variable PRF can be written as:

$Yi = \beta1 + \beta2X2i + \beta3X3i + \ldots. + ui$

The models used in this study are as follows.

Yi: total costs, medicine costs, intervention costs, material costs, examination costs

β1: Intercept/constant

X2i: gender

X3i: age

X4i: hospitalization duration

X5i: hospitalization place

Wherein Yi is the dependent variable; X2 and X3 are explanatory (or independent) variables; u is probabilistic destructive term; i is the ith observation; if the data are time series, t will be the tth observation.

In the above equation, β_1 is the constant term. Although this, in mechanical interpretation, means the average value of Y when X_2 and X_3 equal to zero, as usual, it shows the average effect on Y of all variables not included in the model. $\beta 2$ and $\beta 3$ are called partial regression coefficients. Their meanings are described below.

The mean of u_i is zero:

- For each i, $E(u_i \mid X_{2i}, X_{3i}) = 0$

There is no autocorrelation:

- $orv\ (u_i, u_j) = 0\ (i \neq j)$

There is a constant variance:

- $var\ (u_i) = \sigma^2$

Common variables between u_i, and each variable are zero:

- $orv\ (u_i, X_{2i}) = orv\ (u_i, X_{3i}) = 0$

No modelling error was made:

- The model was set up correctly.

There is no exact multi-linearity between X variables:

There is no exact linear relationship between X_2 *and* X_3.

Limitations of the Study: Study data are limited to a tertiary University Hospital in Turkey. Similar studies should be conducted in countrywide secondary-level public hospitals and private hospitals. This study is limited to the treatment costs of COVID-19 disease borne by the SSI. The cost of a disease does not consist of only one perspective and direct medical costs and should be analysed from different perspectives, taking into account indirect non-medical costs. In our study, the determination of the disease's daily and per-patient costs is an approximately average determination. Whereas each patient hospitalized with the same disease consumes hospital resources (cost factors) in different ways. The HAC pricing policy created by SSI is not suitable for this. Besides, the treatment of comorbid diseases of each patient was not considered in the study.

RESULTS

The study contains four variables that affect the cost factors. These are gender, age, hospitalization period, and place.

Gender: The results have analysed the effect of being a male on cost with the Male 1, Female 0 hypothesis.

Hospitalization Place: The effect of being in an intensive care unit on costs was analysed with pandemic intensive care 1, pandemic services 0 hypotheses. All models have heteroscedasticity problems. This reduces the confidence in the coefficients. Nevertheless, the results can be interpreted in terms of the general trend.

The relationship between the total costs, medicine, medical equipment, intervention, and examination costs invoiced to SSI for HAC and the variables of these cost factors are shown in the tables below (Table 1).

Table 1. The Effect of gender, age, hospitalization duration and place on total cost

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	360.0995	545.9311	0.659606	0.5098
Age	31.56875	12.37886	2.550214	0.0110
Hospitalization Duration	1626.876	47.64136	34.14838	0.0000
Hospitalization Place	4945.501	667.8411	7.405205	0.0000
C	-7012.179	918.1144	-7.637587	0.0000
R-squared	0.677198	Prob(F-statistic)		0.000000
F-statistic	302.6186	Durbin-Watson stat		2.022019

The effect of gender on total cost (Prob>0.05) is not significant. In another saying, gender discrimination has no effect on the total cost. A one-year increase in the patient's age increases the total cost by 31.50 TRY, and a one-day increase in the hospitalization duration increases the total cost by 1.626,80 TRY. Hospitalized patients in intensive care increase the total costs. Since this is a dummy variable, the average was 4,945.00 TL, but it is a correct approach not to give figures. Regarding total invoice amounts, hospitalized patients in pandemic intensive care and hospitalization duration appears to have a greater effect on costs.

Accordingly (Table 2), it was observed that being in the intensive care unit had a negative effect on medicine cost, but this was not statistically significant (Prob=0.9479). Due to the treatment fees of intensive care patients made by SSI over the price of the package (including medicine, material, intervention, and examination), medicine costs appear to be low. A one-year increase in patient age has a weak positive effect on medicine costs, but the effect's confidence interval is significant according to 10%. It is seen that each male increases the cost of medicine use by 208.38 TRY, and each additional daily admission increases the medicine cost by 70.37 TRY compared to females.

Table 2. The effect of gender, age, hospitalization duration and place on medicine costs

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	208.3812	92.98429	2.241037	0.0254
Age	3.680410	2.108397	1.745596	0.0814
Hospitalization Duration	70.37376	8.114391	8.672710	0.0000
Hospitalization Place	-7.435709	113.7483	-0.065370	0.9479
C	-134.6614	156.3754	-0.861141	0.3895
R-squared	0.133563	Prob(F-statistic)		0.000000
F-statistic	22.23637	Durbin-Watson stat		2.075677

Accordingly (Table 3), it was determined that the amount of material used for males increased by 181.68 TRY, an additional yearly age increase by 4.03 TRY, and each additional patient staying in intensive care increased by 343.56 TRY. By contrast, a one-day increase in hospital stay reduces the cost of material usage by 13.48 TRY.

Table 3. The effect of gender, age, hospitalization duration and place on medical equipment costs

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	181.6824	69.15958	2.627003	0.0088
Age	4.035029	1.568177	2.573069	0.0103
Hospitalization Duration	-13.48266	6.035297	-2.233967	0.0259
Hospitalization Place	343.5670	84.60336	4.060915	0.0001
C	-120.1599	116.3085	-1.033114	0.3020
R-squared	0.055110	Prob(F-statistic)		0.000001
F-statistic	8.413323	Durbin-Watson stat		1.997523

Accordingly (Table 4), the effect of being male on intervention costs is not statistically significant (Prob=0.9402). All other variables have a positive and significant effect on cost. A one-year increase in patient age has a weak positive effect on intervention costs, but the effect's confidence interval is significant according to 10%. One-day increase in the hospitalization duration increases the intervention cost by 1,531.38 TRY, and the treatment in the pandemic intensive care unit increases the intervention cost by 4,842.94 TRY.

Table 4. The effect of gender, age, hospitalization duration and place on intervention costs

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-41.23016	549.6374	-0.075013	0.9402
Age	22.10736	12.46290	1.773854	0.0766
Hospitalization Duration	1531.388	47.96479	31.92733	0.0000
Hospitalization Place	4842.948	672.3750	7.202749	0.0000
C	-6970.922	924.3473	-7.541453	0.0000
R-squared	0.646518	Prob(F-statistic)		0.000000
F-statistic	263.8330	Durbin-Watson stat		2.000020

Accordingly (Table 5), the effect of gender and age on examination costs is statistically insignificant (Prob>0.05). While staying in the pandemic intensive care unit reduces the examination costs by 242.31 TRY, an additional day of age increases the examination costs by 33.91 TRY. Due to the treatment fees of intensive care patients made by SGK over the package price, medicine costs appear to be low.

Table 5. The effect of gender, age, hospitalization duration and place on examination costs

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-19.36029	34.37494	-0.563209	0.5735
Age	1.236443	0.779444	1.586315	0.1132
Hospitalization Duration	33.91910	2.999772	11.30722	0.0000
Hospitalization Place	-242.3170	42.05109	-5.762442	0.0000
C	192.3051	57.80973	3.326517	0.0009
R-squared	0.260315	Prob(F-statistic)		0.000000
F-statistic	50.76535	Durbin-Watson stat		1.979820

It was determined that among patients hospitalized due to COVID-19, the invoice amount per patient is the highest 222,884.30 TRY and the lowest 49.19 TRY; the highest amount of drug Immun Globulin IV (Human) (Non-specific) is 5,041.99 TRY (6 units), the lowest Pantoprazole is 14.79 TRY (5.010 units), the highest material amount Triathlon Total Stabilizer Femoral Component Cemented - (Left Size # 5) is 3.019.63 TRY (1 piece) the lowest Three-Way Faucet is 0.28 TRY (2.293 pieces), the highest intervention amount (P) Hemicolectomy (right or left) is 10,327.43 TRY (1 unit), the lowest Oxygen inhalation therapy (hourly) is 1,00 TRY (33.301 hours), the highest test amount Apheresis Immun TDP is 782.00 TRY (9 pieces), the lowest Potassium (Serum/Plasma) is 2.00 TRY (4.687 pieces) (Table 6).

Table 6. Costs and factors affecting them

	Invoice	**Medicine**	**Medical Equipment**	**Intervention**	**Examination**	**Gender**	**Age**	**Hospitalization Duration**	**Hospitalization Place**
Mean	5657.506	616.7373	235.2373	4313.395	392.6949	0.609966	59.71478	5.773196	0.237113
Median	3769.640	312.7800	10.69000	2667.210	281.4600	1.000000	66.00000	4.000000	0.000000
Maximum	222884.3	5041.99	3019.63	10327.43	782.00	1.000000	97.00000	91.00000	1.000000
Minimum	49.19	14.79	0.28	1.00	2.00	0.000000	0.000000	1.000000	0.000000
Std. Dev.	11213.59	1165.778	830.3031	10788.66	466.4374	0.488177	22.95812	5.639799	0.425678
Skewness	13.65352	6.441748	7.073323	14.92851	3.993753	-0.450903	-1.217112	6.865799	1.236205
Kurtosis	249.4517	56.69830	76.83740	286.8118	31.09212	1.203313	3.913445	93.14902	2.528202
Jarque-Bera	1490990.	73950.17	137063.2	1974935.	20684.47	98.00240	163.9259	201648.5	153.6335
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	3292669.	358941.1	136908.1	2510396.	228548.4	355.0000	34754.00	3360.000	138.0000
Sum Sq.Dev.	7.31E+10	7.90E+08	4.01E+08	6.76E+10	1.26E+08	138.4622	306230.7	18480.06	105.2784
Observations	582	582	582	582	582	582	582	582	582
Total Cost (TRY)	7.378.695,22	737.679,43	231.245,27	5.850.916,42	558.854,10				

60% of the patients are male (350 people), 40% are female (232 people), the highest age of the patients is 97, the youngest age is 0 (newborn), and the average age is 59. The longest hospitalization period is 91 days, the shortest is 1 day, and the average is 5.7 days. The rate of patients receiving treatment in the Pandemic Intensive Care Unit is 23% (134 people), and the rate in other pandemic wards is 77% (448) (Table 6). 10% (59 people) of the patients died, 90% (523 people) were discharged after recovery or their current condition.

DISCUSSION

The total amount invoiced to SSI for HAC between March/2020-December/2020 due to COVID-19 disease at the hospital where the research was conducted 7,378,695.22 TRY ($ 1,052,595). It was determined that 10% of this amount is medicine cost 737,679.43 TRY ($ 105,232), and 4% material cost is 231,245.27 TRY ($ 32,988), 79% intervention cost is 5,850,916.42 TRY ($ 834,652) and 7% examination cost is 558,854.10 TRY ($ 79,722) (Chart 1).

The intervention costs are higher than other cost factors caused by the pricing policy of the treatment fees of intensive care patients based on the package price (including medicine, material, intervention, and examination) by SSI.

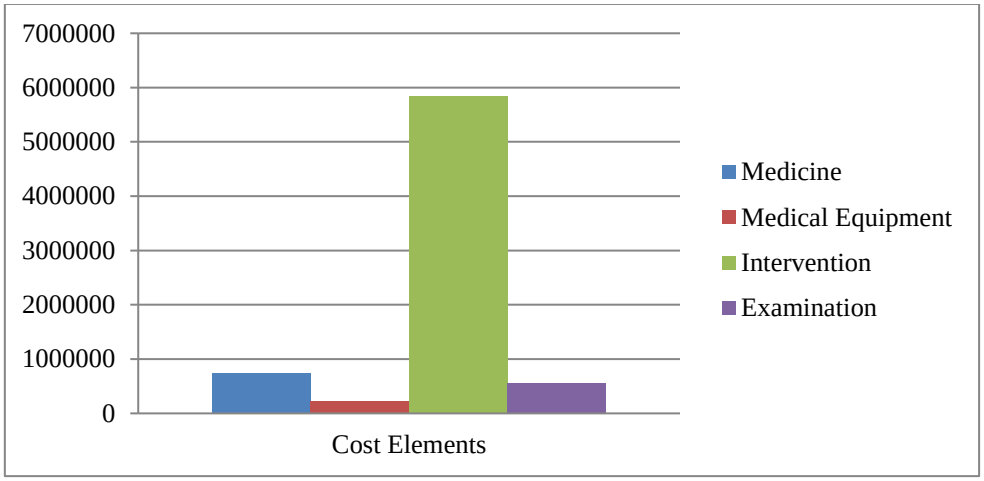

Chart 1. Invoize amount costs (TRY)

The study determined that the total cost of 582 patients treated in different units due to COVID 19 was 7,378,695.00 TRY ($ 1,052,595), and the hospitalization day was 3,514 days. According to this, the average daily cost was determined as ±2.099.80 TRY ($ 299.54), and the average cost per patient was determined as ±12,678.17 TRY (1,808 USD).

Average hospitalization costs in studies investigating medical costs per patient in other countries were reported as 3,045 USD (23) in the United States, 6,827 USD (12) in China, 12,637.42 USD in Latin America, and 2,192 USD (25) in children aged 0-19 in Korea, 12,547 USD (10) in Saudi Arabia, 4,633.43 (26) in India and 4,847 Sterling (27) in the United Kingdom. These differences in average costs between countries are thought to be due to reasons such as applying different methods in disease cost analysis, different treatment protocols, preferences in utilization rates of health personnel and health care resources, and medical equipment price levels across countries.

This study reveals that the treatment cost of COVID-19 disease is less costly in Turkey than in other countries. We can state that the most important reason for this is due to the health system in Turkey much better, the low rate of the population over the age of 65 (9%; 7.3 million), sufficient staff and bed capacity, low cost of medicine, medical equipment, intervention, examination, and other medical care.

In addition to the support provided by the Ministry of Health in the Hospital where the study was conducted, it was determined that there was no shortage of protective materials thanks to the effective material and stock management by the Hospital management. In addition, protective equipment such as masks, gloves, disinfectants, and aprons, which are vital in the epidemic, were donated by philanthropists, contributing to the uninterrupted execution of services (29).

CONCLUSION

In the study conducted, it was observed that gender discrimination did not affect the total cost. However, elderly patients slightly increased the costs. When an overall evaluation is made, it was observed that the intervention cost is the highest cost among the costs, and patients in intensive care unit and hospitalization duration appear to have a greater effect on the total cost.

The results obtained in the study were revealed that the COVID-19 epidemic caused high direct medical care costs. For this reason, to reduce the cost of the disease, it is necessary to resort to lower-cost elements, to encourage the domestic production of medical supplies, medicines, and vaccines, to review the drug price policy these days

when the vaccine is available, to take additional measures to prevent the spread of the disease, to eliminate the transmission rate of the disease with restrictions taking into account the economic balances and ultimately to vaccinate the entire population as soon as possible.

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