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The Similarities and Differences Analysis of OECD Countries in Terms of Health System Indicators

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ABSTRACT

Aim: The aim of this study was to put forth the similarities and differences between the OECD (Organisation for Economic Co-operation and Development) countries while placing the them into two or more groups and determining which variables cause similarities and differences in terms of health indicators and compare them with Turkey.

Methods: The study was conducted in 34 OECD countries. Descriptive statistics have been collected/calculated using health indicators appointed by WHO (World Health Organization). A multidimensional scaling analysis (MDS) has been used to examine the similarities and the differences between the countries with Statistical Package for the Social Sciences (SPSS) 20.0 software.

Results: Turkey, Mexico, Chile and the Republic of South Korea are perceived similar in terms of health systems indicators variables as a result of MDS. Greece (4.538), United States (4,438), Switzerland (4.044), Portugal (4,160), Australia (4,018), Spain (4.062) and Japan (where is the number for Japan) are the coutries having the biggest differences with Turkey in terms of the twelve health sytems indicators among the OECD countiries. Annual growth in health expenditures and neonatal infant mortality rates are the most significant factors that separate Turkey from the other countries.

Conclusion: In order to further develop the health sytem in Turkey, policy makers must take into an account the similarities and differences between Turkey and the OECD countries.

Key words: MDS, health system, health indicators, OECD, Turkey

OECD ÜLKELERİNİN SAĞLIK GÖSTERGELERİ AÇISINDAN BENZERLİK VE FARKLILIK ANALİZİ

ÖZET

Amaç: Bu çalışmanın amacı Türkiye temelli olarak seçilmiş sağlık göstergeleri açısından OECD ülkelerinin benzerlik ve farklılık analizini yapmak, ülkeleri sağlık göstergelerine göre alt gruplara ayırmak ve farklılıklara ve benzerliklere neden olan değişkenleri belirlemektir.

Hastalar ve Yöntem: Çalışma Dünya Sağlık Örgütü tarafından sağlık sistemi göstergesi olarak gösterilen değişkenler yardımı ile 34 OECD ülkesinde gerçekleştirilmiştir. Öncelikle sağlık göstergeleri ile tanımlayıcı istatistikler gerçekleştirilmiş daha sonra ise Çok Boyutlu Ölçekleme Analizi yardımı ile ülkeler arasındaki benzerlik ve farklılıklar (Statistical Package for the Social Sciences) SPSS 20.0 paket programı aracılığıyla gerçekleştirilmiştir.

Bulgular: Çalışma sonuçlarına göre Türkiye, Meksika, Şili ve Kore Cumhuriyeti ile sağlık göstergeleri açısından benzer algılanmaktadır ve OECD ülkeleri arasında bir alt grubu oluşturmaktadır. Yunanistan, Amerika Birleşik Devletleri, İsviçre, Portekiz, Avusturalya, İspanya ve Japonya OECD ülkeleri içinde sağlık göstergeleri açısından Türkiye'nin en benzemez olduğu ülkelerdir. Sağlık harcamalarındaki bir yıllık büyüme oranı ve neonatal bebek ölüm hızı Türkiye'yi diğer ülkelerden ayıran en önemli sağlık göstergeleri olarak bulunmuştur.

Sonuç: Ülkemizin sağlık sisteminin geliştirilmesi ve sağlık çıktılarının iyileşmesi için politika yapıcılara Türkiye ile OECD ülkeleri arasındaki farklılıkları dikkate almaları önerilmektedir.

Anahtar sözcükler: MDS, sağlık sistemi, sağlık göstergeleri, OECD, Türkiye

The World Health Organization [WHO] describes a health system as consisting of organizations, institutions, resources, and people whose primary purpose is to improve our health. A health system needs staff, funds, information, supplies, transport, communications, and overall guidance and direction. A health system needs to provide services that are responsive and financially fair, while treating people decently (1).

Strengthening health systems involves addressing key constraints related to health worker staffing, infrastructure, health commodities (such as equipment and medicines), logistics, tracking progress, and effective financing (2). Along with the resources used in health systems, transnational, geographical, cultural and demographic differences, income, lifestyle and habits, non-health factors such as technological advances and training are also known to have an impact on health systems (3).

The health sector, which affects the future of society, has undergone extensive studies around the world since 1960. New applications and system changes have been made to develop the health systems in many countries in the world (4). By obtaining complete and timely data on critical issues, such as access to health services, equity, efficiency of services, health policies, performance and so on, it is possible to do monitoring and evaluation about health systems. For this purpose, Thousands of indicators can be used to evaluate health systems. However, both the number and technical diversity of indicators, and the differences in the health systems of the countries making transfer and comparison of experience difficult. Basic health indicators are widely used in assessing the health systems and the effectiveness of health expenditure (5).

Determining Turkey's position and revealing the differences in terms of the selected health systems indicators between the OECD countries by providing a graphical notation and underlying structures that may cause differences are extremely important when planning the future of the health system in Turkey. Many studies can be found in the literature on the comparison of health systems of countries. Most of these studies usually compare only two or three countries in terms of some health indicators or contrast a number of countries in terms of one health indicator. The current study compared a number of countries while looking at a large number of health indicators. The purpose of this study was to divide 34 OECD countries into subgroups ensuring location of them in the graphical plane, put forth the similarities and the differences between the countries and determine the position of Turkey according to the general trend.

Materials and method

The study focused on the level of satisfaction with health services, out of pocket expenditures for health in comparison to total consumption, health expenditure per capita, growth in health expenditures for the previous year, growth in health expenditures for the previous five years, total expenditure on health as a percentage of GDP, general government expenditure on health as a percentage of total expenditure, neonatal mortality rate (per 1000 live births), life expectancy at birth, density of physicians per thousands of citizens, density of magnetic resonance imaging (MRI) units per milions of citizens, and hospital beds per one hundred thousand citizens, for each of 34 chosen OECD countries, based on data for these indicators collected for each country (6). The data used in this study are considered indicators of health system indicators by WHO. These indicators are often used to assess the health care system. Therefore, they were included in the study. The indicators were categorized in the following categories: health workforce, health financing, essential medicines, governance and aid effectiveness, priority health technologies and service delivery. According to WHO each category has some subcategories sub-indicators?. These subcategories, however, were not evaluated in the study due to the absence of some indicators for a number of the OECD countries? The most recent data, 2013, for the accessible indicators, was used In some cases, like the level of satisfaction with health care, there were acces to even more recent data. Overall, the most current data for each indicator was used in this study.

First descriptive statistics were performed by using selected indicators and then multidimensional scaling analysis (MDS) was used to examine the similarities and differences between the countries with SPSS 20.0 software.

Findings

Comparison of the OECD countries according to some indicators of health services

Some indicators about health expenditures, health care services satisfaction, health care resources and mortality of the chosen 34 OECD countries have been explained in relation to Turkey, in this part of the study.

The level of satisfaction with health care services

The level of satisfaction with health care services in the 34 chosen OECD countries has been provided in Figure 1.

The level of satisfaction in Turkey with nationally available health care services is 71 percent. This ratio is the same

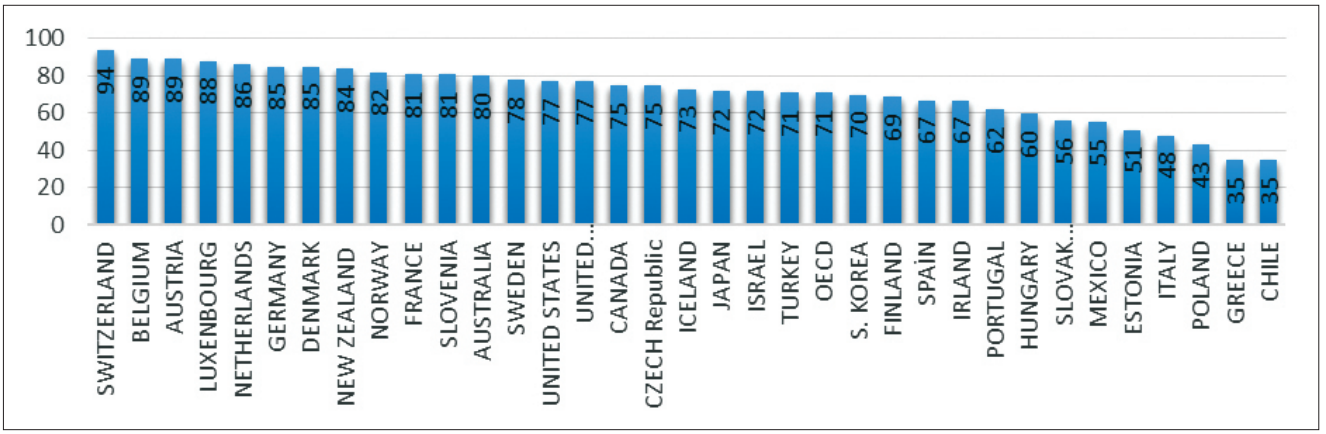

Figure 1. The Level of satisfaction with health care services, 2014

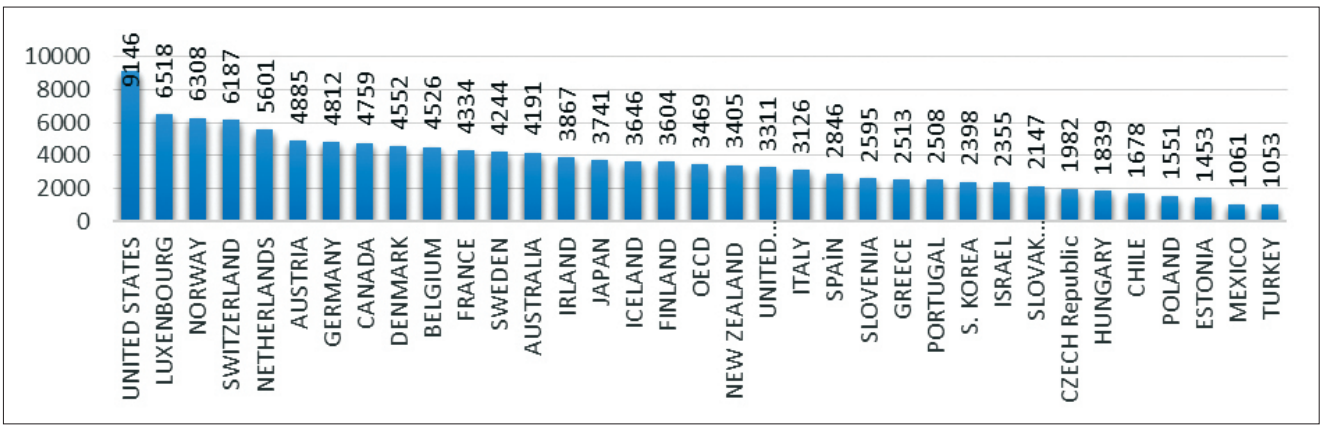

Figure 2. Total health expenditure per capita,2013 (PPP)

as the OECD average. Switzerland ranks first with a 94 percent satisfaction level with nationally available health care services. Chile shows the lowest level of satisfaction among the 34 chosen countries,with 35 percent. Turkey's satisfaction ratio is higher than the ratio of satisfaction with health care services in South Korea, Finland, Spain, Ireland, Portugal, Hungary, Slovakia, Mexico, Estonia, Italy, Poland, Greece and Chile.

Total health expenditure per capita (PPP)

Total health expenditures per capita for the 34 chosen OECD countries is shown in Figure 2.

Turkey ranks last in terms of total health expenditure per person amongst all OECD countries, with $1053 (in USD) per year. The average is $3469 USD per capita in the OECD, a figure three times bigger than the average for Turkey. The OECD countries with the highest per capita health expenditure are respectively the United States ($9146 USD), Luxembourg ($6518 USD) and Norway ($6308 USD).

Growth in health expenditures (1 year)

The growth rate in health expenditures per capita in the selected countries for 2013, relative to 2012 expenditure-sis shown in Figure 3.

Turkey ranks first in the growth rate in health expenditures per capita with a growth rate of 7.79 percent in 2013 relative to 2012 expenditures. South Korea and Greece closely follow Turkey in this area, with respective growth ratios of 6.42 and 6.29 percent. In 2013, the following countries Mexico, Portugal, Italy, Slovenia, Denmark, Spain and the Czech Republic – had negative growth ratio relative to 2012 health expenditures. Health expenditures in the Czech Republic have dropped the most with a negative growth ratio of 2.83 percent according to the previous year.

The growth rate in the health expenditures per capita of selected countries in 2013 according to 2009 has been explained in the text.? Netherlands ranks first with the biggest health expenditures growth ratio of 29.98 percent

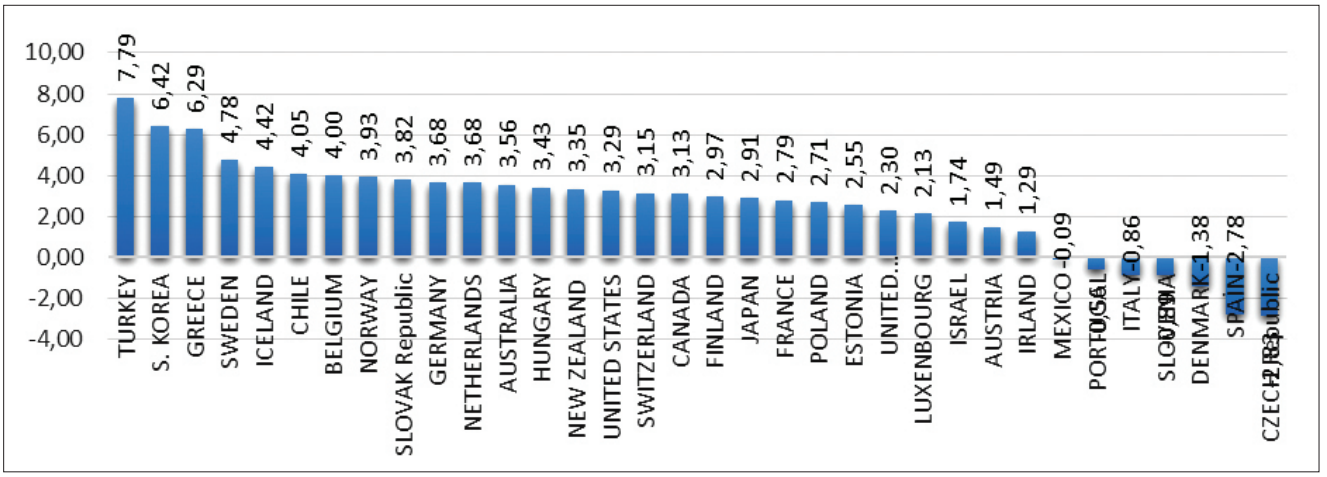

Figure 3. Growth in Health Expenditures For 1 year,2013

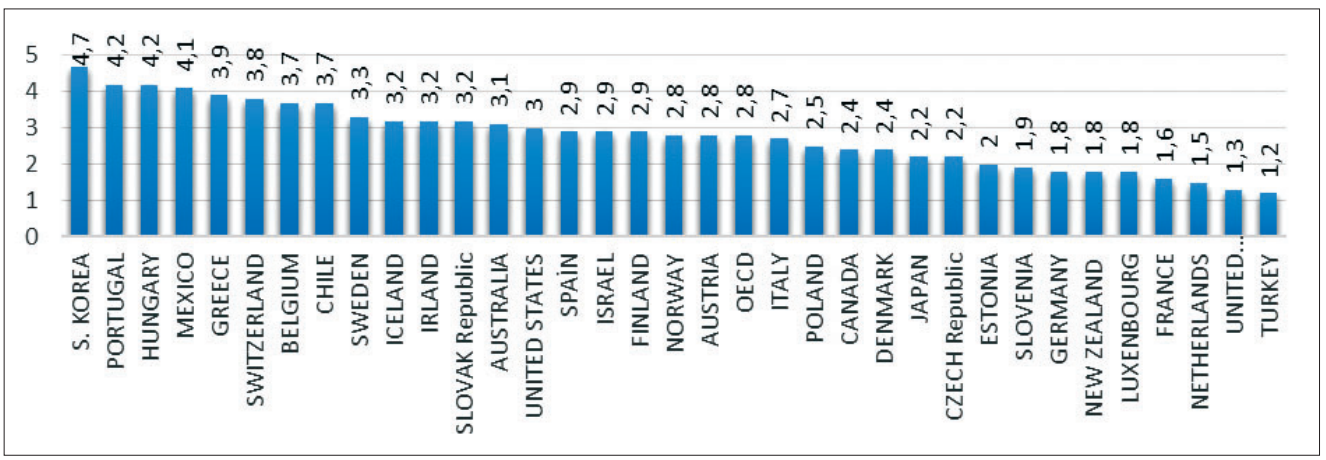

Figure 4. The percentage of out of pocket expenditures in consumption, 2012

in 2013 relative to 2009 expenditures amongst the OECD countries. Chile and South Korea rank second and third with respective growth ratios of 28.01 percent and 21.06 percent. The growth ratio of Turkey over the past five years (2009-2013) is 15.38 percentwhile Greece shows the biggest decrease in OECD in 2013 relative to 2012 with a negative growth rate of -20.53 percent. That means there has been significant development in Greece since 2012. The average growth rate of the OECD countries for 2013 expenditures relative to 2009 is 4.93 percent. Besides Greece, the United Kingdom, the Czech Republic, Ireland, Spain and Portugal are the countries with a negative growth ratio in this area.

The Percentage of out of pocket expenditures for health in consumption

The percentage of out of pocket health expenditures in total consumption in the 34 OECD countries is shown in Figure 4.

The percentage of out of pocket expenditures in consumption within Turkey in 2012was 1.2 percent. This ratio was the lowest among all OECD countries. The average within the OECD was 2.8 percent. The countries having the highest percentage of out of pocket expenditures in total healthcare consumption were South Korea (4.7 percent), Portugal (4.2 percent), and Hungary (4.2 percent).

Total expenditure on health as a percentage of Gross Domestic Product (GDP)

The percentage of total health expenditures in GDP for the 34 OECD countries has been shown in Figure 5 for 2013.

Turkey has the lowest health expenditures as a percentage of GDP amongst the 34 OECD countries in 2013 at 5.6 percent of the national GDP. The average for the OECD is 9.15 percent of GDP. The United States, with 17.10 percent is the country with the highest health expenditures as a percentage of GDP in 2013. The Netherlands is in second position with 12.9 percent of GDP and France ranks third with 11.7 percent of GDP, just before Switzerland.

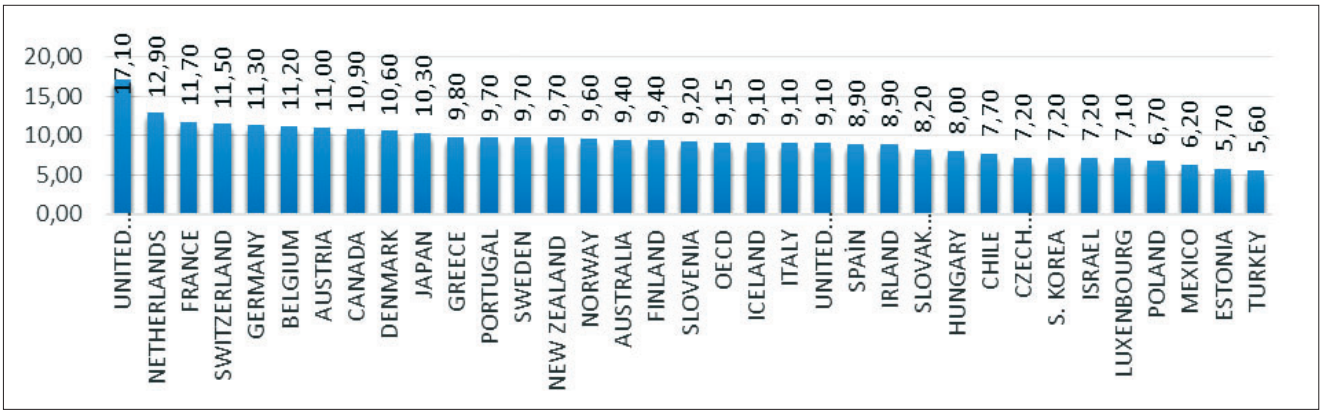

Figure 5. Total expenditure on health as a percentage of GDP, 2013

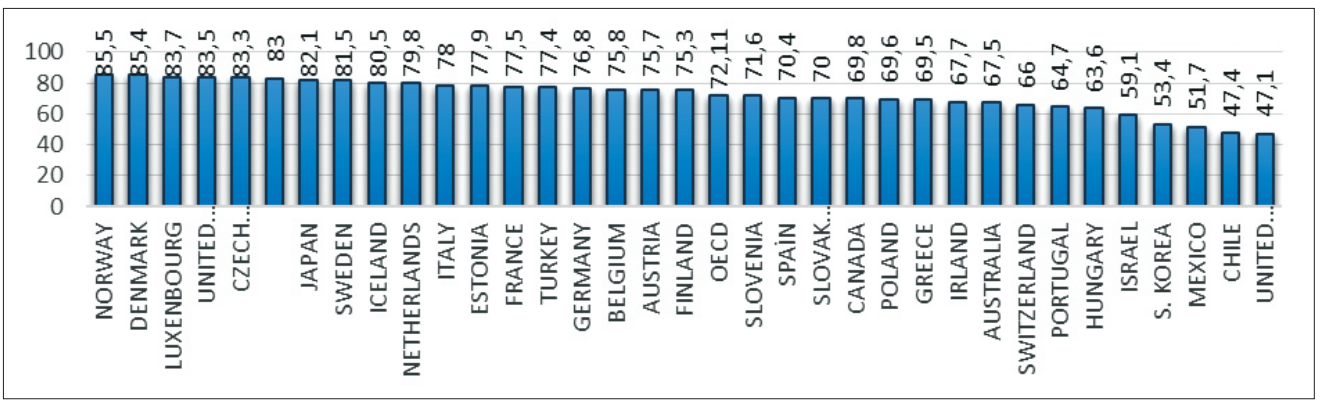

Figure 6. General government expenditure on health as a percentage of total expenditure, 2013

General government expenditure on health as a percentage of total health expenditure

The percentage of general government health expenditures in total health expenditures of 34 OECD countries in 2013 shown in Figure 6.

The general government health expenditures in total health expenditures in Turkey is 77.4 percent. This means the Turkish government spends 77 of every hundred Turkish Liraon health care. The average in the OECD is 72.11, not so far from Turkey. While the United States, Mexico and Chile have the lowest government support amongst OECD countries for their respective health sectors, with the ratio respectively at 47.1, 51.7, and 47.4 percent. Norway, Denmark and Luxembourg are the countries whose health sector ishaving the biggest support from their goverments respectively at 85.5, 85.4 and 83.7 percent.

Life expectancy at birth

The life expectancy at birth of 34 OECD countries in 2013 shown in Figure 7.

Due to improvement of the living conditions, there has been a great increase in life expectancy for many OECD countries over the past 50 years. While life expectancy at birth in Turkey was 48.3 in 1960, now it is 75 years. In spite of this increase, the life expectancy at birth in Turkey still remains amongst the lowest in the OECD countries. In 1960 the average life expectancy for the OECD was 68.5, it has now reached 80.4 years. Japan has the longest life expectancy at birth between the OECD countries at 84 years.

Health care services resources and indicators I

The WHO-measured density of physicians per thousands of citizens, and hospital beds per one hundred thousand citizens, for 2011 in selected OECD countries, is shown in Figure 8.

We investigate some health care services resources in Turkey. While the density of physicians is about 170 per thousand citizens, and hospital beds per one hundred thousand citizens are about 235, these figures are significantly below the average for OECD. The average density of physiciansin OECD is about 330 phyisicians per thousand and the average of hospital beds per one hundred thousand are about 540.

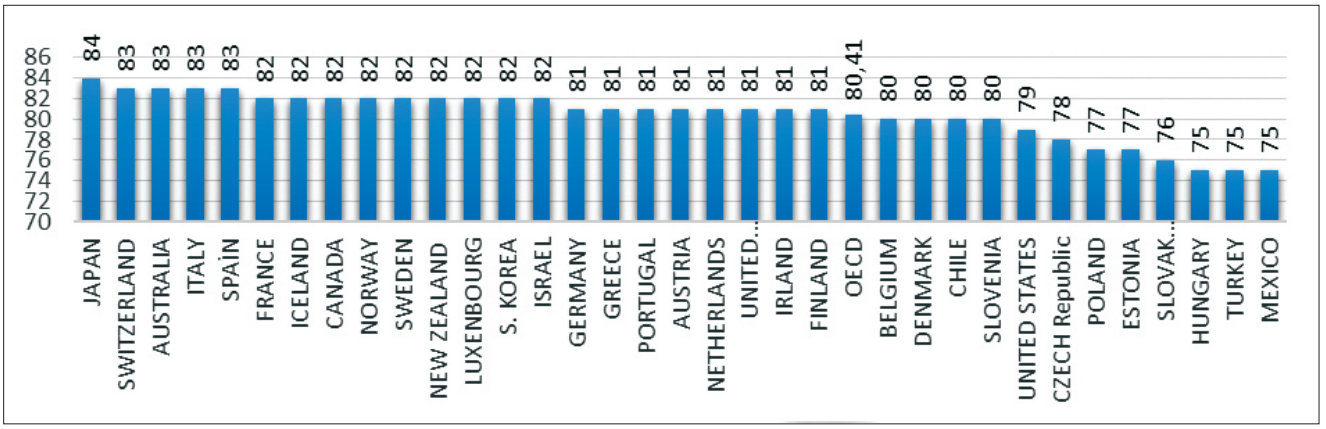

Figure 7. Life expectancy at birth,2013

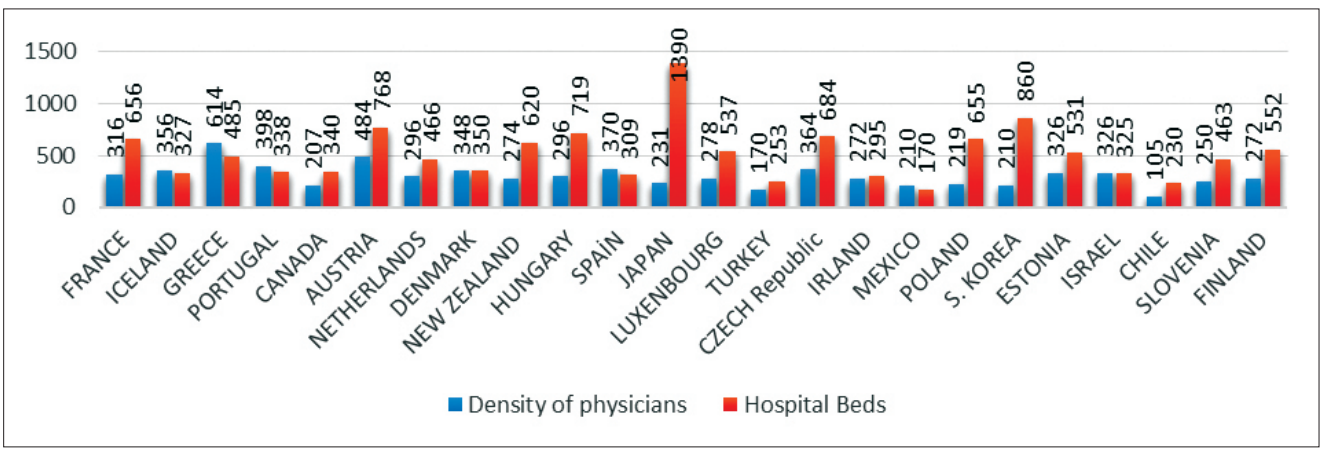

Figure 8. Health care services resources, 2013

Health care services resources and indicators II

The density of magnetic resonance imaging (MRI) units per million population and neonatal mortality rate per thousand live births in 2011 for the selected OECD countries are shown in Figure 9.

The density of magnetic resonance imaging (MRI) units per million population in Turkey is 6.14 and the neonatal mortality rate per 1000 live births is 11.2. The figure for neonatal mortality rate is fairly above the OECD average, which stands at 2. The countries with the best indicators in this area are Iceland and Luxembourg. Both have a neonatal mortality ratio of 0.90 per thousand live births. Turkey pocesses the worst average in this area amongst the 34 OECD countries.

The results of multidimensional scaling (MDS)

MDS is a statistical analysis which reveals relationships between objects, benefiting from the distance between them, in cases where the relationship between objects is unknown but can be calculated (7). MDS has become more and more popular as a technique for both multivariate and exploratory data analysis (8). Although the roots of the MDS analysis are based on studies in the field of psychophysics and psychometrics (9), it is not limited only to these areas nowadays and it has applications in a wide range of fields such as sociology, economics, biology, business, education, chemistry, archeology, etc. (10). MDS is a set of data analysis methods, which allow one to infer the dimensions of the perceptual space of subjects. The raw data entering into an MDS analysis is typically a measure of the global similarity or dissimilarity of the stimuli or objects under investigation. The primary outcome of an MDS analysis is a spatial configuration, in which the objects are represented as points. The points in this spatial representation are arranged in such a way, that their distances correspond to the similarities of the objects: similar object are represented by points that are close to each other, dissimilar objects by points that are far apart (8).

Multidimensional scaling can be considered as an alternative to factor analysis. In general, the goal of these

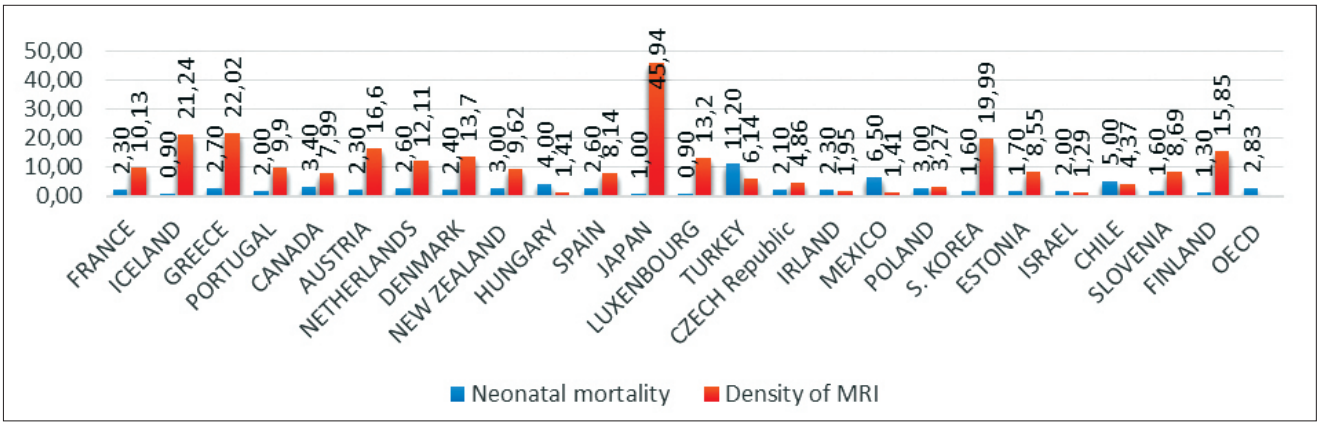

Figure 9. MRI and neonatal mortality, 2013

techniques is to detect meaningful underlying dimensions that allow the researcher to explain observed similarities or dissimilarities (distances) between the investigated objects. However, these two techniques are fundamentally different in terms of methodology. Factor analysis requires that the underlying data is distributed as multivariate normal, and that the relationships are linear. MDS imposes no such restrictions. Moreover, MDS can be applied to any kind of distances or similarities, whereas factor analysis requires us to first compute a correlation or covariance matrix. Factor analysis tends to extract more factors (dimensions) than MDS; as a result, MDS often yields more readily interpretable solutions (11-12).

The effectiveness of multidimensional scaling analysis is measured by Kruskal stress statistics. Kruskal stress statistic is calculated by taking the square root ratio of the difference between the estimated size of the configuration to the distance of the configuration with the configuration size (13).

Iteration was continued until less than 0.001 for k=2 stress statistics. Iteration was stopped in fourth iteration when the 0.00022 result was reached. Stress is a moderate level of alignment and for statistics 0.19?. The comformity of the configuration distance with the original away from the configuration according to the size of their value; The stress, poor comformity ≥ 0.20, 0.10 < stress moderate comfirmatory, stress=0,05 is considered good, stress=0.00 is considered complete or perfect comfirmatory (13). The stress solutions value which is close to size 0 indicates solutions desired or considered as appropriate in MDS. Stress value has been calculated according to Kruskal's formula and found 0.86267. That means, stress value, for k = 2 dimensions, are explained 0.86 percent of data. If stress values desired to examine with different sizes, k=1.2.3.4 chart, it is preferred that high stress valuable dimension by checking stress values (7,13).

Multidimensional scaling analysis was carried out in two dimensions in our analysis. According to this result, the coordinates determined by the variable of OECD countries are shown in the stimulus coordinates Table 1.

According to the stimulus coordinates table, the United States, Switzerland, Austria, Netherlands, Japan and Luxembourg have both positive and values above 1. These countries have been perceived similarly in terms of the twelve primary variables. So they are the most important separator in dimension 1. Other's values are fairly close to 0. The negative values of Portugal, Greece, Hungary, Turkey, the Czech Republic, Irland, Mexico, Poland, Slovakia, S.Korea, Estonia, Israel, and Chile are another remarkable situation in dimension 1.In between these countries, Mexico, Chile, Portugal and Turkey have negative values above -2. Greece has a negative value above -3. That means, Greece is the country furthest from general trend in OECD in dimension 1.

In dimension 2, Portugal, Italy, Spain, the Czech Republic have both positive and values above 1. But the most important value has Greece with 2.5431. Other's values are again close to 0. So Greece is the most important separator country in this dimension. When the negative values in the second dimension are examined, it is seen that the United States, Switzerland, Germany, France, Belgium, Canada, Norway, Australia, Netherlands, Sweden, New Zealand, Hungary, Japan, Turkey, South Korea and Chile have negative values. The United States has a negative value above -2, so it is the country furthest from the general trend in dimension 2. The countries which have negative values are not important in the dimension.?

The differences matrix has been obtained from the data after stimulus coordinates. The differences matrix shows the close and the distant OECD countries. Since the matrix is extremely huge, only part of it is shown in Table 2.

Table 1. Stimulus coordinates

Stimulus Number	*Stimulus Name*	*1. Dimension*	*2. Dimension*
1	United States	1,3247	-2,1279
2	Switzerland	1,1024	-0,5617
3	Germany	0,9603	-0,2669
4	France	0,7939	-0,183
5	Iceland	0,3646	0,5062
6	Belgium	0,4852	-0,5137
7	Greece	-0,3708	2,5431
8	Portugal	-0,2011	1,288
9	Canada	0,1641	-0,5047
10	Norway	0,9957	-0,089
11	Australia	0,2298	-0,2147
12	Austria	1,0717	0,2969
13	Netherlands	1,0659	-1,1301
14	Sweden	0,3951	-0,2058
15	Denmark	0,7748	0,5678
16	Italy	0,1471	1,1606
17	New Zealand	0,4737	-0,3091
18	Hungary	-1,4263	-0,2324
19	United Kingdom	0,3019	0,5562
20	Spain	0,1548	1,2949
21	Japan	1,7294	-0,9763
22	Luxenbourg	1,1674	0,2487
23	Turkey	-2,8034	-1,6263
24	Czech Republic	-0,0206	1,4032
25	Irland	-0,1462	0,3717
26	Mexico	-2,3839	0,0129
27	Poland	-1,27	0,0273
28	Slovakia	-0,9841	0,1523
29	S. Korea	-0,8488	-1,563
30	Estonia	-0,9252	0,7829
31	Israel	-0,4297	0,0644
32	Chile	-2,1542	-1,1686
33	Slovenia	0,1419	0,3939
34	Finland	0,1196	0,002

Table 2. The Differences matrix*

	United States	*Switzerland*	*Germany*	*France*	*Iceland*	-----
United States	0.000					
Switzerland	1.792	0.000				
Germany	2.370	1.076	0.000			
France	2.262	1.179	0.000	0.000		
Iceland	2.801	1.281	1.186	.976	0.000	
Belgium	2.058	.591	.718	.788	.854	.....
Greece	3.945	2.946	2.865	2.896	2.012	.....
Portugal	2.954	1.793	2.136	1.916	1.136	.....
Canada	1.789	1.089	1.069	.579	.930	.....
Norway	2.409	.861	.883	.841	.587	.....
Australia	2.211	.549	.946	.729	.493	.....
Austria	2.510	.747	.337	.707	1.194	.....
Netherlands	2.026	1.353	.793	.715	1.761	.....
Sweden	2.461	1.032	1.167	.920	.152	.....
Denmark	2.591	1.489	1.167	.846	1.049	.....
Italy	3.185	1.969	1.753	1.431	1.006	.....
New Zealand	2.737	1.387	.410	.077	.915	.....
Hungary	3.105	2.255	2.131	2.234	1.798	.....
United Kingdom	2.923	1.977	1.220	.700	.836	.....
Spain	3.147	1.938	1.990	1.602	1.276	.....
Japan	3.586	2.350	1.309	1.425	2.304	.....
Luxenbourg	2.956	1.673	1.094	.906	1.028	.....
Turkey	4.438	4.044	3.586	3.468	3.623	.....
Czech Republic	3.751	2.516	1.748	1.612	1.682	.....
Irland	2.424	1.438	1.565	1.192	.577	.....
Mexico	3.585	3.148	3.404	3.225	2.866	.....
Poland	3.426	2.698	2.040	1.907	1.815	.....
Slovakia	2.966	2.202	1.757	1.722	1.438	.....
S. Korea	3.333	2.007	2.310	2.394	2.071	.....
Estonia	3.749	2.719	1.878	1.768	1.407	.....
Israel	2.884	1.418	1.594	1.402	1.065	.....
Chile	3.350	3.071	3.332	3.100	2.885	.....
Slovenia	2.814	1.836	2.266	.835	1.164	.....
Finland	2.487	1.206	.786	.535	.320	.....

*Due to table size, only some part have been shown here but the similarities have been explained in the text.

In the matrix, the most similar and the most different from one another in terms of the twelve health variables countries can be seen. While the values close to 0 represent similiarity of countries, the values above 1 stand for dissimilarity. According to this, the following paired countries, with values close to 0, are similar to each other: Germany and New Zealand, France and New Zealand, Iceland and Australia, Iceland and Sweden, Iceland and Finland, Greece and Finland, Portugal and Spain, Canada and Australia, Canada and Finland, Norway and Sweden, Australia and

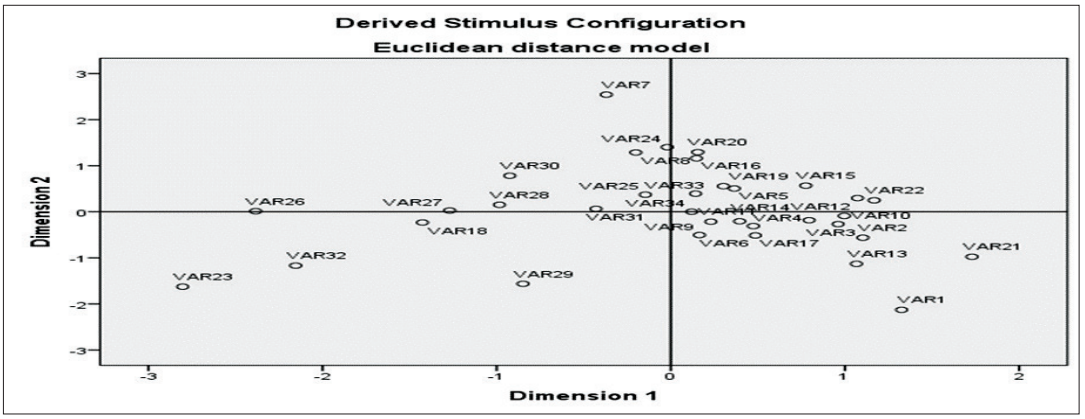

Figure 10. Euclidean distance model (for cases)*

Israel, Australia and Finland, Sweden and Finland, Italy and Spain, New Zealand and Finland, Hungary and Slovak Republic, Irland and Finland, Poland and Slovak Republic, Poland and Estonia.

Another case pointed out in the differences matrix is Turkey. The dissimilarity value of Turkey with each country is above 3. So Turkey is the country most separate from other OECD countries. The United States (4.438), Switzerland (4.044), Portugal (4.160), Austria (4.018), Spain (4.062) and Japan (4.418) are the countries most distinct from Turkey in terms of the twelve health indicators.

An euclidean distance model showıng After stilumus coordinates table and differences matrix table.

The OECD countries perceived to be most similar were collected together in the figure. According to the multidimensional scaling analysis, Turkey, Mexico, Poland, Chile, Hungary, Slovakia, S.Korea, Estonia, Greece, the United States and Japan are different from the general trend in terms of the twelve health variables discussed in this study. From this list of countries, Turkey, Chile, and Mexico can be evaluated together as a subgroup. Poland, Hungary, Slovakia, South Korea, Estonia and Greece can be regarded as another subgroup. But Japan and the United States are completely different from each other and the rest of the countries. So their tendencies are completely unlike anyother.

After the similarities and differences relations between the countries explained.

The euclidean distance model was created according to the twelve health variables, in order to visualise which variables create similarities and which variables give rise to perception of differences between the OECD countries.

According to the model, the two variables: *neonatal mortality rate per 1000 live births and growth in health expenditures for the past year*, cause Turkey to be perceived differently from the other countries. *Density of physicians per capita*, life expectancy at birth, total expenditure on health as a percentage of GDP and health expenditure per capita are variables on which all countries are similar to each other. The United States relatively low *general government expenditure on health as a percentage of total expenditure* is a variable which causes it to be perceived differently from the other countries.

Discussion and conclusion

In the last years there has been an increase in comparative analyses of health systems and outcomes of specific policies and practices. New analytical methods have been developed to make those comparisons more comprehensive.

In this study, the similarities and the differences analyses were performed according to the indicators pointed as health care system indicators by WHO in relation to 34 OECD countries. Indicators that can be accessed for all countries were included in the analysis in order to achieve more accurate results. We aimed to put forth the similarities or the differences relative to each other, divide the countries into two or more groups and determine which variables cause similarities / differences in terms of health selected indicators for OECD countries based on Turkey.

***NOTE:** **Var 1:** United States, **Var 2:** Switzerland, **Var 3:** Germany, **Var 4:** France, **Var5:** Iceland, **Var 6:** Belgium, **Var 7:** Greece, **Var 8:** Portugal, **Var 9:** Canada, **Var 10:** Norway, **Var 11:** Australia, **Var 12:** Austria, **Var 13:** Netherlands, **Var 14:** Sweden, **Var 15:** Denmark, **Var 16:** Italy, **Var 17:** New Zealand, **Var 18:** Hungary, **Var 19:** United Kingdom, **Var 20:** Spain, **Var 21:** Japan, **Var 22:** Luxenbourg, **Var 23:** Turkey, **Var 24:** Czech Republic, **Var 25:** Irland, **Var 26:** Mexico, **Var 27:** Poland, **Var 28:** Slovak Republic, **Var 29:** S. Korea, **Var 30:** Estonia, **Var 31:** Israel, **Var 32:** Chile, **Var 33:** Slovenia, **Var 34:** Finland.

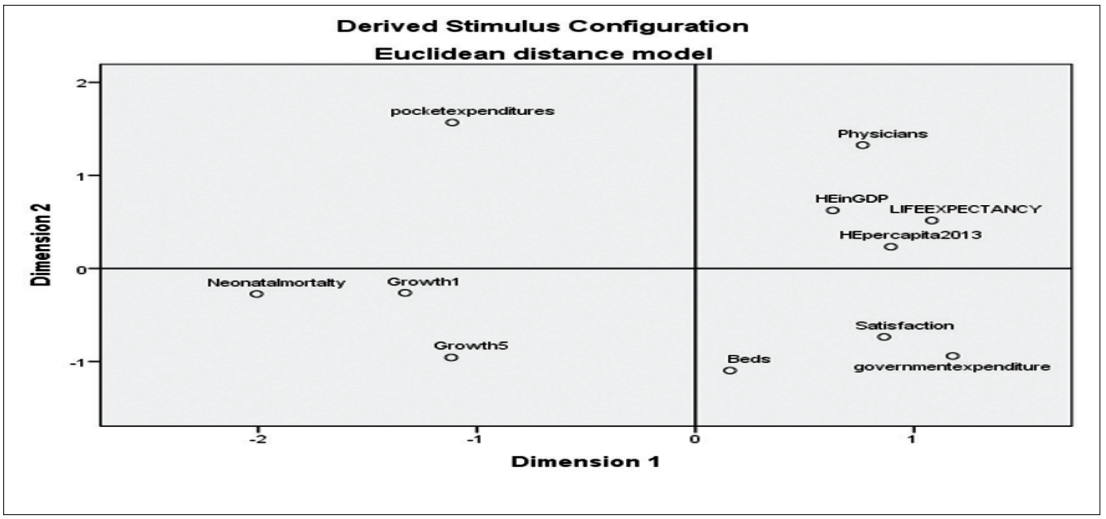

Figure 11. Euclidean distance model (for variables)*

As a result of multidimensional scaling analysis; Turkey, Mexico, Chile and the Republic of South Korea are perceived similar in terms of the health variables, therefore these countries can be considered as a subgroup among the OECD countiries in the study. A study, conducted by Ersoz in 2008 comparing the OECD countries in level of health care and health expenditure, suggests that Turkey, the Republic of SouthKorea, Mexico, Poland and Slovakia are perceived as similar in OECD and the most different country is the USA. So we can conclude that the results of both studies are similar. In the Ersoz study Turkey was found to be the most different from Austria, Germany and Norway (13). In our study, Greece, the United States, Switzerland, Portugal, Australia, Spain, and Japan are the coutries having thr biggest differencies with Turkey in terms of the 12 health indicators. In an other study conducted by Rehimli which compares Turkey with OECD in the woman health indicator, Turkey has showed similarity with Mexico compared to other countries. In addition regarding the prolificacy education, Turkey is similar to the USA, Portugal, Great Britain and France., Regarding the pregnancy outcomes, Turkey is similar to Korea, Italy, France, Japan and the Czech Republic (14). In a study carried out in the European Union countries and Turkey in health indicators by Sıgırlı, it has been found that Turkey has showed clear difference from the other countries except from Slovakia, Hungary and the Czech Republic especially with regard to the main health indicators and health accounts (15).

***NOTE:* Neonatalmortality:** Neonatal mortality rate per 1000 live births, **Growth 1:** Growth in health expenditures for 1 year, **Growth 5:** Growth in health expenditures for 5 years, **Pocketexpenditures:** Out of pocket expenditures for health in consumption, **Physicians:** Density of physicians (per 1 000 population), **HEin GDP:** Total expenditure on health as a percentage of GDP, **HEpercapita2013:** health expenditure per capita, **Beds:** Hospital beds per 100 000, **govermentexpenditure:** General government expenditure on health as a percentage of total expenditure

America and Japan are the most different countries among the OECD countries according to the study results. In the study conducted by Schieber about health spending in OECD, the USA has been found to be the most dissimilar in health expenditures (16). In another study carried out by Anderson et al., the USA has been found as different in the per capita health spending of the median OECD country (17). Our study showed similar results with Schieber's and Anderson's. Turkey and Greece are the countries farthest from each other in terms of selected health indicators. Annual growth in health expenditures and neonatal infant mortality rates are the two most important factors that led Turkey's distancing from the other countries. The growth in health expenditures can be assessed as promising for the future of Turkey's health care but the average infant mortality rates need urgent addressing being approximately 4 times higher than the avarage for OECD.

In recent years, all countries strive to reform their health systems with the help of international health organizations such as WHO, Word Bank etc. These efforts allow us to make the comparison between the countries in terms of standard criteria and sharing experiences. The study results, draw attention to the presence of some common problems in Turkey too.

The height of the infant mortality rate, per capita health expenditure, the ratio of total health expenditures in GDP, physician density are fairly far from OECD countries. The report, published by the World Health Organization, has noted the infant mortality rate in 2012. The World Health Organization and UNICEF have recommended visits to the homes by professional health team in the first week after

birth to reduce infant mortality. In addition, increasing in general education level, raising awareness and education of mothers, a more equitable distribution of income in the country and increasing the insured individual number and proportion are recommended to reduce infant mortality to the countiries (18). So, policy makers must take into account these suggestions in order to create improvement in infant mortality rates in Turkey. Another issue made clear by the study is the need to increase the number of health professionals in Turkey. It is difficult to solve the problem of human resources in the health sector without large-scale macroeconomic policies (19). Therefore, this problem can not be overcome with just theefforts of the health care managers, but also by the will of lawmakers to follow adequate education and fiscal policies.

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