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ORIGINAL ARTICLE

The Effect of Clinical Decision Support System on the Rates of Patients Who Reapply to the Emergency Department with the Same Diagnosis

Klinik Karar Destek Sisteminin Acil Servise Aynı Tanı ile Tekrar Başvuran Hasta Oranlarına Etkisi

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ABSTRACT

Aim: Reducing re-applications with the same diagnosis within 24 hours and decreasing the density in emergency departments where many patients apply, as in the pandemic period.
Materials and Methods: A comparison was made between quarterly and monthly increases in 2021, 2020 and 2019 during the pandemic period. The data was obtained from the Basic Health Statistics Module and 2 data sets followed by the Health Quality Standards Emergency Department. As a statistical method, data on emergency department admissions and re-admissions for the January-June periods of 2019, 2020 and 2021 were compared with Kruskal Wallis and Mann Whitney tests.
Results: Kruskal Wallis test shows that there is a statistically significant difference in terms of re-applications between 2019, 2020 and 2021 (p = 0.006). According to Mann Whitney test results, there are statistically significant differences in terms of re-applications between 2019 and 2020 (p = 0.004) and between 2020 and 2021 (p = 0.016). However, this difference is not significant between 2019 and 2021 (p = 0.336). Re-application Rates: The Kruskal Wallis test shows that there is a statistically significant difference in re-application rates between 2019, 2020 and 2021 (p = 0.034). According to Mann Whitney test results, there is a statistically significant difference in re-application rates between 2020 and 2021 (p = 0.025). However, this difference is not significant between 2019 and 2020 (p = 0.078) and 2019 and 2021 (p = 0.150).
Conclusion: Re-application rates to emergency services within 24 hours returned to their pre-pandemic level. Differences in physician-based approaches in diagnosis and treatment have been eliminated and standardization has been achieved. It is aimed to make working easier and more effective in situations that lead to mass applications to emergency hospital services. The same situation has become an example of similar practices in hospital services.

Keywords: Emergency Service, Hospital Information Management System, Clinical Decision Support System, Health Informatics, Health System.

ÖZ

Amaç: Pandemi döneminde olduğu gibi 24 saat içinde aynı tanıyla tekrar başvuruların azaltılması ve çok sayıda hastanın başvurduğu acil servislerdeki yoğunluğun azaltılması.
Gereç ve Yöntem: Pandemi döneminde 2021, 2020 ve 2019 yıllarında üçer aylık ve aylık artışlar arasında karşılaştırma yapıldı. Elde edilen veriler Temel Sağlık İstatistikleri Modülü ve Sağlık Kalite Standartları Acil Servis tarafından takip edilen 2 veri setinden elde edilmiştir. İstatistiksel yöntem olarak 2019, 2020 ve 2021 Ocak-Haziran dönemlerine ait acil servis başvuru ve tekrar başvuru verileri Kruskal Wallis ve Mann Whitney testleri ile karşılaştırıldı.
Bulgular: Kruskal Wallis testi 2019, 2020 ve 2021 yılları arasında yeniden başvurular açısından istatistiksel olarak anlamlı farklılık olduğunu göstermektedir (p=0,006). Mann Whitney testi sonuçlarına göre 2019-2020 (p=0,004) ve 2020-2021 (p=0,016) yılları arasında yeniden başvurular açısından istatistiksel olarak anlamlı farklılıklar bulunmaktadır. Ancak 2019 ile 2021 yılları arasında bu fark anlamlı değildir (p=0,336). Yeniden Başvuru Oranları: Kruskal Wallis testi, 2019, 2020 ve 2021 yılları arasında yeniden başvuru oranlarında istatistiksel olarak anlamlı bir fark olduğunu göstermektedir (p = 0,034). Mann Whitney testi sonuçlarına göre 2020 ile 2021 yılları arasında yeniden başvuru oranlarında istatistiksel olarak anlamlı farklılık bulunmaktadır (p=0,025). Ancak 2019-2020 (p=0,078) ile 2019-2021 (p=0,150) yılları arasında bu fark anlamlı değildir.
Sonuç: Acil servislere 24 saat içinde yeniden başvuru oranları salgın öncesi seviyesine döndü. Tanı ve tedavide hekim merkezli yaklaşımlardaki farklılıklar ortadan kaldırılarak standardizasyon sağlanmıştır. Acil hastane hizmetlerine toplu başvurulara yol açan durumlarda çalışmanın daha kolay ve etkin hale getirilmesi amaçlanıyor. Aynı durum hastane hizmetlerinde de benzer uygulamaların örneği haline geldi.

Anahtar Kelimeler: Acil Servis, Hastane Bilgi Yönetim Sistemi, Klinik Karar Destek Sistemi, Sağlık Bilişimi, Sağlık Sistemi.

Introduction

The number of patients with the same diagnosis within 24 hours in the operation of the emergency department of the institution is one of the parameters showing the performance of the emergency department. It aims to increase the efficiency and effectiveness of service delivery in emergency departments and to ensure patient safety. There is information about emergency services in the official newspaper of our country (1).

The emergency department readmission rate within 24 hours varies depending on the structure of the health institution (training, research, branch, district hospital, etc.) and the structure of the people served. For this reason, when calculating the rate of our own hospital, an average value of 2% was obtained by using the common values of hospitals with structurally similar population and matching the retrospective emergency department admission rates. However, this rate can be targeted at 1% or less in large educational research hospitals. The goal is to ensure the quality of emergency service and reduce readmissions.

Readmission to the emergency department means that the patient is readmitted to the emergency

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department within 24 hours with the same diagnosis. The emergency departments are considered a performance indicator. In fact, many large hospitals in our country have conducted studies on this subject. In the largest-scale study in Konya in 3-year retrospective study, the number of patients admitted to the emergency department was 1.083.553, the number of readmissions with the same diagnosis was 7.775, and the rate of readmissions to the emergency department was 0.72%. The facility where this study is conducted is one of the most important and largest facilities in Turkey in terms of capacity. In this context, about one million 100 thousand patients applied to the institution on a three-year average, and almost one percent of them returned within 24 hours. This figure is considered to be an important indicator of sample size. When examined, most of the patients applied for the reasons requiring urgent treatment. However, if the recurrence rate is high, it is seen that the recurrence rate is repeated due to the low severity of the disease or the occurrence of recurrent symptoms after treatment in the acute phase (2).

Another study was conducted by the State Hospital. With the comparative analysis of statistical data in the last three years, information regarding patient care of patients who applied to the emergency department between 2011 and 2013 (n=312,255) was included in the study in order to contribute to studies on reducing re-admission rates, providing service in the emergency department and improving quality. A total of 312,255 patients were admitted to the emergency department in the last three years. The admission rate of these patients was determined as 29%, and it was found that 11,420 (3.6%) patients returned to the emergency department within 24 hours (3).

Similar studies were conducted in the emergency department of university hospital, and approximately the same rates were obtained (4,5).

There is no doubt that such research is important when it comes to establishing risk groups for our country.

The pandemic has put the greatest strain and exhaustion on healthcare facilities around the world and in our country. As mass diseases (not only epidemics, but also mass poisonings, serious traffic accidents, etc.) increase the burden on hospital emergency services, it has become more important to act faster and collectively. All healthcare facilities around the world have created numerous action plans to combat the disease.

During the pandemic, all areas of our hospital had to be reserved for the epidemic except for compulsory and emergency surgeries. During the pandemic, the first and most intensive applications were made to emergency departments in all healthcare facilities. This has become increasingly important, especially in situations such as epidemics. During the pandemic in our hospital, some systematic practices were implemented in our hospital to relieve this aspect of the hospital during the pandemic period. Here, we present the study in which we will see the root cause analysis and digital application clinical decision support and results in HIMSS that will reduce the application again.

The hospital has a capacity of 255 beds in Group B, and an average of 530 patients are admitted per day. This number increased to 750 during the pandemic. Keeping the overall readmission rate to a minimum was important since the increase in the pandemic period also increased the risk of transmission. Thus, we tried to keep the overall readmission rate as low as possible during this period. Because of this, clinical decision support applications were designed during the pandemic.

Since 2014, a transformation has started in this State Hospital to carry out all medical procedures in HIMSS digitally. In 2017, it was fully achieved with the HIMSS-EMRAM Level 7 certificate (5). In this hospital, which has a fully digital structure, Applications that accelerate the system and provide ready data flow (clinical decision support systems, alarms, reminders, chronic disease alerts, allergy alerts, etc.) for physicians, nurses, and all employees who make electronic data entry are adapted to the use of physicians, nurses and all HIMSS medical data providers in the hospital. Developed over the past five years, the applications have made the service available and shareable by securing data in the hands of the appropriate facilitator (6).

The Basic Health Statistics Module (TSIM), a module in the framework of the Ministry of Health that we can see monthly and instantly, and the SKS (Quality indicators in health) indicator, which is monitored four times a year quarterly, are both tracked in the readmission data to the emergency department within 24 hours (7,8).

Materials and Methods

In this hospital, we provided data by using two follow-up indicators in reapplication follow-up within 24 hours.

First, quality indicators in the emergency department, the data are calculated monthly and entered into the quality unit indicator system as an average value every three months as soon as the data are reapplied within 24 hours. Indicator cards were created by considering the rates in the homogeneous hospitals at the target value in our hospital. Our indicator cards, which are monitored monthly, are controlled by the quality unit.

For each indicator, cards containing information such as the purpose of the indicator, data collection method, calculation method, target value, and those responsible were created.

This indicator is a measurement tool developed to monitor the rate of patients who reapply to the emergency department with the same complaint within 24 hours.

Second, using this method, the number of patients who presented to the emergency department within 24 hours with the same diagnosis was proportioned to the total number of patients admitted during the period, and the percentage was calculated accordingly. Corrective and preventive actions above the target are initiated and notified to the emergency department supervisors, and then the suggestions are submitted to the management.

The second follow-up tool is carried out by the hospital statistics unit. The statistics record operator receives an instant and retrospective report of the number of reapplications to the emergency department on the same day from the "patient reappearing during the day" table on the emergency service work form emergency statistics report screen. These data are entered monthly into the Basic Health Statistics module (TSIM), which is a module in the structure of the Ministry of Health. It can be considered as the assistant chief physician in charge of statistics.

The reapplication to the emergency service is made by the quality unit from the data collection and data analysis screens in HBYS. The accuracy of the data is checked by the data analysis screen and the data collection analysis report.

In addition to the reapplication indicator within 24 hours in the emergency department, it is also monitored by the quality unit in the sub-indicators:

1.Readmission to the emergency department on the basis of a physician,

2.Presence of consultation at first admission in readmission to the emergency department,

3.Readmission data on the basis of diagnosis to the emergency department.

SKS (Quality indicators in health) emergency department readmission indicator sets are followed by the hospital quality management unit. In the period data, the target value of the pandemic outpatient clinic created in the emergency department was calculated as 2.6 within 24 hours.

Having exceeded the targets, hospital data equivalent to ours was used for comparisons (A2 and B group).

Statistical Analysis

Data from 2 sources were compared with data on emergency department admissions and re-admissions for the January-June periods of 2019, 2020 and 2021.

Emergency Service Applications:

The average number of applications for 2019 is 10,118.67±1,519.05

7,291.33±2,972.53 for 2020

Re-Applications:

The average number of reapplications in 2019 was 194.00±25.92

109.00±30.46 in 2020

Reapplication Rates:

1.93% ±0.26 in 2019

1.59% ±0.38 in 2020

Fever Polyclinic Applications:

The average number of applications in 2020 is 201.33±171.98

It was determined as 1,905.83±1,360.43 for 2021.

Fever Polyclinic Reapplication Rates:

3.31% ±2.66 in 2020

It was determined as 1.99 ± 0.70% in 2021.

Data on emergency department admissions and re-admissions for the January-June periods of 2019, 2020 and 2021 were compared with Kruskal Wallis and Mann Whitney tests.

Emergency Service Applications:

According to the Kruskal Wallis test result, there is no statistically significant difference in terms of emergency department admissions between 2019, 2020 and 2021 (p = 0.121). Additionally, Mann Whitney tests confirm that there is no statistically significant difference between 2019-2020 (p=0.055), 2019-2021 (p=0.150) and 2020-2021 (p=0.522).

Re-Applications:

The Kruskal Wallis test shows that there is a statistically significant difference in terms of re-applications between 2019, 2020 and 2021 (p = 0.006). According to Mann Whitney test results, there are statistically significant differences in terms of re-applications between 2019 and 2020 (p = 0.004) and between 2020 and 2021 (p = 0.016). However, this difference is not significant between 2019 and 2021 (p = 0.336).

Reapplication Rates:

The Kruskal Wallis test shows that there is a statistically

Table 1. Monthly reapplication rates of the emergency department between 2019, 2020, and 2021 (2nd-period comparison)

	January-June period of 2019			January-June period of 2020			January-June period of 2021			Kruskal Wallis	Kruskal Wallis Mann Whitney for Groups 1-2	Kruskal Wallis Mann Whitney for Groups 1-3	Kruskal Wallis Mann Whitney for Groups 2-3
	X	sd	M	X	sd	M	X	sd	M	p value	p value	p value	p value
Emergency Service Application	10.118,67	1.519,05	9.680,00	7.291,33	2.972,53	6.966,00	8.207,83	1.904,66	8.941,50	0,121	0,055	0,150	0,522
Reapply	194,00	25,92	193,00	109,00	30,46	105,00	177,33	35,66	170,00	0,006	0,004	0,336	0,016
Reapplication/Emergency Service Application Rate (%)	1,93	0,26	1,91	1,59	0,38	1,44	2,20	0,32	2,28	0,034	0,078	0,150	0,025
Fever Polyclinic				201,33	171,98	119,00	1.905,83	1.360,43	1.425,50				0,020
Reapply				3,67	2,52	4,00	39,50	34,22	28,00				0,020
Reapplication/Fever Polyclinic Application Rate (%)				3,31	2,66	4,65	1,99	0,70	2,25				0,439

significant difference in re-application rates between 2019, 2020 and 2021 (p = 0.034). According to Mann Whitney test results, there is a statistically significant difference in re-application rates between 2020 and 2021 (p = 0.025). However, this difference is not significant between 2019 and 2020 (p = 0.078) and 2019 and 2021 (p = 0.150).

Fever Polyclinic Applications:

There is a statistically significant difference detected by the Mann Whitney test in terms of Fever Polyclinic applications between 2020 and 2021 (p = 0.020).

Fever Polyclinic Reapplication Rates:

Mann Whitney test shows that there is no statistically significant difference in terms of Fever Polyclinic re-admission rates between 2020 and 2021 (p = 0.439).

Results

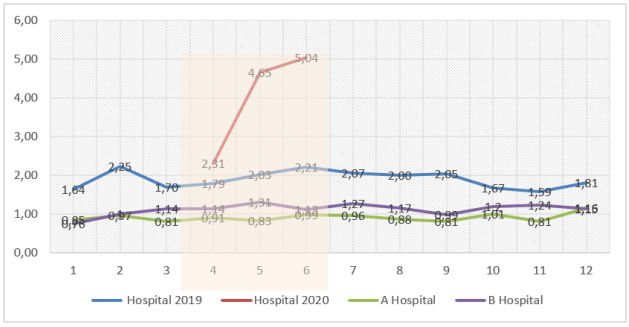

Fig. 1. Comparison of reapplication rates between the same group of hospitals and this Hospital

In Figure 1, the rates of re-admissions within 24 hours during the pandemic process were compared in other equivalent hospitals. It has been determined that the values of the hospital have increased 2-3 times compared to other hospitals in April-June 2020 during the pandemic process.

The rate of re-admissions to the Emergency Department in 2019 before the pandemic and the rate of re-admissions to the Emergency Service Pandemic Polyclinic, which was opened in our hospital at the beginning of the 2nd term of 2020, were compared using the hospital information system (indicator).

The data for the specified years were taken from the indicator on a monthly basis, and a comparison was made.

In 2019:

1.Emergency Department Total Examination,

2.Number of Re-Admissions with the same Complaint (Other equivalent hospital data are also available).

In 2020:

1.Number of Emergency Pandemic Polyclinic Examinations,

2.Number of Re-Admissions with the same Complaint.

While the rate of data for the first month of 2019 was 1.64%, the rate of data for the 4th month was calculated as 2.51%.

With root cause analysis, the rate of re-admissions to the pandemic outpatient clinic can be measured annually in the indicator, and monthly, physician, and diagnostic data can be collected. Those with a high rate can be seen.

Since all branch physicians of the hospital, who are included in the sub-indicators of this indicator, treat COVID-19 patients, physician-based and diagnosis-based differences, as well as the differences between non-branch physicians during and after the operation, the shift was also examined in terms of each of these indicators. Data obtained in detailed physician-based examinations:

Non-specialist physician examinations and diagnoses of the patients who reapplied within 24 hours were evaluated, and mostly "Medical observation diagnosis for Z03 ICD suspicious conditions" was made, that is, they could not make a definitive diagnosis.

According to the April 2020 task list, it is seen that 79% of the emergency pandemic outpatient clinics are carried out by non-branch physicians for emergency response.

In line with these data, according to the evaluations made at the meeting where the number of COVID-19 patients in the pandemic was higher than the daily number of outpatient clinics of the hospital and the indicator data obtained; The inadequacy of the active work of physicians whose expertise is not appropriate in the COVID-19 outpatient clinic in the detection and staging of the disease are the mistakes of physicians from different branches in the diagnosis and treatment protocol.

Developing a "technological" solution for the problem:

1.Providing training on post-treatment protocols of different branches for COVID-19 treatment and follow-up.

2.Ensuring standardization at every stage of the disease with the pathways and rule engines created in HIMSS. (CDSS)

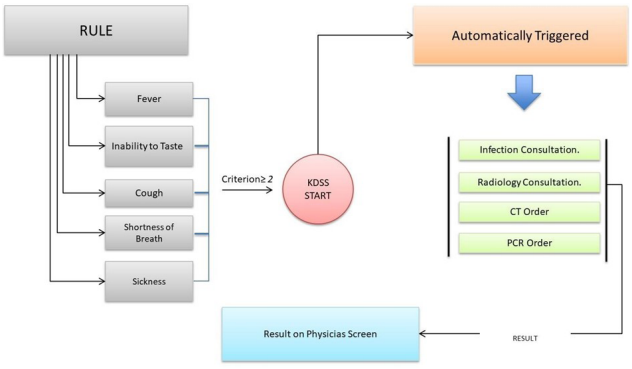

Fig. 2. Covid Emergency Service CDSS template.

Shows the decision support system created in the hospital information system. Guidance was provided

for the diagnosis of U07.3 ICD-10 when more than one of the patient's symptoms (high fever, dyspepsia, cough, shortness of breath, malaise) were marked when presenting to the emergency department. 3 ICD-10 diagnosis was selected on the "Structural History" screen, the newly created PPE system was automatically activated. Warning and Supplementary Texts Added.

Implementation of the identified solution:

The "Structural Anamnesis" screen was created for the symptoms of disease specific to the COVID- 19 Polyclinic. When more than one of the COVID-19 symptoms (high fever, inability to taste, cough, shortness of breath, weakness) was marked, guidance was provided for the diagnosis of U07.3 ICD- 10. As soon as the proposed U07.3 ICD-10 diagnosis was selected on the "Structural Anamnesis" screen, the newly created PPE system was automatically activated. Warning and Auxiliary Texts Added PCR tests, CT thorax and laboratory tests were requested to ensure that the result was displayed on the PPE screen. The tests were templatized, and standardization was achieved in the form of a COVID-19 package. Simultaneous lung CT scan information with the examinations and consultation examinations were also provided to the radiologist, and the process was shortened by providing automatic requests.

It was ensured that every branch physician took the same action. It aimed to make a rapid diagnosis and reduce reoccurrences.

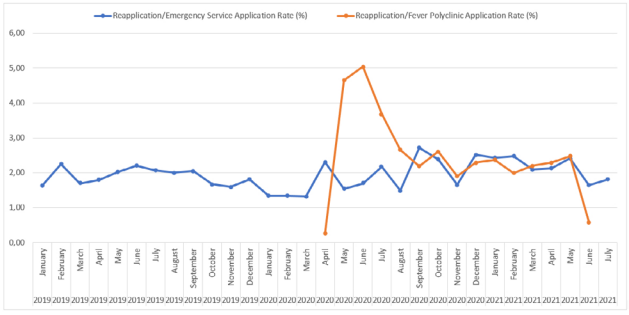

Fig. 3. Monthly comparison of reapplication rates of the emergency department between 2019, 2020, and 2021 (2nd-period comparison).

Discussion

With the pandemic, digital approaches have gained momentum all over the world, especially in the field of health, and in our country. These applications have both become widely mobile and have been effective in the functioning of health institutions. Related to this, "AŞİLA, e-NABİZ, HSYS (public health management system)" applications in our country are applications that are used effectively especially during the pandemic process. (9,10, 11).

In our health institution, it was planned to reduce the hospital emergency department density by using digital infrastructure during the pandemic process and new applications were made. It becomes even more important to act faster and collectively in cases of mass illness (not only in epidemics, but also in mass poisonings, serious traffic accidents, etc.) that increase the burden of emergency services in hospitals. One of the performance indicators of the emergency service, "reapplying with the same diagnosis within 24 hours", has increased the efficiency of the emergency service with digital improvement.

The rate of "re-application within 24 hours with the same diagnosis", which is one of the performance indicators that shows the efficiency of the emergency service, is monitored by quality indicators and TSIM data of the Ministry of Health. Since all pandemic patients were welcomed by the emergency service during the pandemic period, a pandemic outpatient clinic was established in the emergency department, as in all hospitals, where all physicians, regardless of their specialization, work.

Decision support systems were developed within the hospital information system by using the hospital's full digital structure to standardize the management of COVID-19 patients and to reduce readmissions in the pandemic polyclinic established in the State Hospital emergency department during the pandemic period. PPE activity was monitored during the days and months of the pandemic. The rates of admission to the emergency department with the same diagnosis in the 24 hours before the pandemic were compared during and after the pandemic.

The clinical decision support systems created in the intensive care units of our hospital within the scope of HIMSS-EMRAM have been the sepsis CDSS TUBITAK project.

There is a similar study on intensive care device integrations and PPEs in a project carried out at the university. In this study, a joint project of comprehensive engineering and clinical units is presented:

"The biggest advantage of similar data from home and abroad is that there are logical correlations between the data that were not previously revealed by the use of various data mining algorithms, thus improving both the quality of patient care and the quality of patient care.

In our hospital, different PPEs are used with early warning and automatic instruction in disease-based intensive care units (sepsis, MI, etc.), PPE, and COVID-19 services.

In addition to the PPEs we use in the current HIMSS of our hospital, algorithms including emergency approach steps for diseases, have been prepared for non-specialist physicians working in the emergency department. Some of these algorithms are exemplified by the algorithms of the Ministry of Health, which include treatment and examination approaches in some chronic or acute cases and are offered to physicians.

Every institution should take actions that provide effective and efficient added value in every aspect of the health service it offers in line with its digital structure.

Conclusion

Focusing on decreasing readmissions with the same diagnosis within 24 hours in emergency departments has been a significant objective, particularly during the pandemic. By implementing strategies such as standardization, eliminating differences in physician-induced approaches, and achieving a return to pre-pandemic application rates, hospitals have taken important steps towards improving the effectiveness and quality of emergency care. These efforts aim to ensure that patients receive appropriate and consistent diagnosis and treatment, ultimately leading to a reduction in readmissions and better overall outcomes.

Ethics

Ethics Committee Approval: This study was initiated after receiving approval from the hospital administration and the ethics committee (interventional Scientific Research Ethics Committee, approval number: E-10840098-772.02-7446)

Author Contributions

Conception: E.Ö., Design: E.Ö., İ.K., Data Collection and Processing: E.Ö., İ.K., Supervision: E.Ö., İ.K., Analysis and Interpretation: E.Ö., İ.K., Literature Review: E.Ö., İ.K., Writer: E.Ö., İ.K., Critical Review: E.Ö., İ.K.

Disclosures

Conflict of Interest: No conflict of interest was declared by the authors.

References

1.Aslan, Ş., Güzel, Ş. Türkiye'deki Hastane Öncesi Acil Sağlik Hizmetleri. International Journal Of Social Humanities Sciences Research 2018, 5.31: 4995-5002.

2.Yorulmaz, M. , Karaalp, F. , Bükecik, N. & Özyılmaz, A. F. Acil Servise Tekrar Başvuru Orani Değerlendirmesi. Selçuk Üniversitesi Sosyal ve Teknik Araştırmalar Dergisi 2017; 14: 92-99 .

3.İncesu, E. , Beylik, U. , & Küçükkendirci, H. "The problem of recurrence of admission in emergency health services: a state hospital emergency service survey in Turkey." Academic Overview International Journal of Refereed Social Sciences 2016; 53: 1-13

4.Akyol, C., Oktay, C., Hakbilir, O., Akyol, J. A., & Tür, Ç. F. Evaluation of patients who reapply to the emergency department with the same complaint. Journal of Emergency Medicine of Turkey 2016; 6(3): 108-116.

5.Sultanoğlu, H., Gamsızkan, Z., & Cangür, Ş. Examination of Repeated Applications and Solution Suggestions in Patients who Apply to the Emergency Department in a Year. Düzce University Journal of the Institute of Health Sciences 2021; 11(1): 50-55.

6.Ministry of Health. Dijital Hastane [Internet]. 2014 [cited 2023 Jun 6]. Available from: https://dijitalhastane.saglik.gov.tr

7.Ministry of Health. Indicator Management [Internet]. 2018 [cited 2023 Jun 6]. Available from: https://shgmkalitedb.saglik.gov.tr/TR,9066/indikator-yonetimi.html

8.Ministry of Health. TSIM [Internet]. [cited 2023 Jun 6]. Available from: https://ckysportal.saglik.gov.tr/TR,4801/tsim.html

9.Ministry of Health. Vaccination tracking application for physicians and healthcare personnel [Internet]. 2021 [cited 2023 Jun 6]. Available from: https://asila.saglik.gov.tr/

10.Ministry of Health. About e-Nabız [Internet]. [cited 2023 Jun 6]. Available from: https://enabiz.gov.tr/Yardim/Index?lang=en

11.Ministry of Health. HSYS [Internet]. [cited 2023 Jun 6]. Available from: https://hsys.saglik.gov.tr