



# BANDIRMA ONYEDİ EYLÜL ÜNİVERSİTESİ SAĞLIK BİLİMLERİ VE ARAŞTIRMALARI DERGİSİ BANU Journal of Health Science and Research

DOI: 10.46413/boneyusbad.1551077

Özgün Araştırma / Original Research

## Analysis of the Problems Encountered in the Central Physician Appointment System with DEMATEL Method

DEMATEL Yöntemi ile Merkezi Hekim Randevu Sisteminde Karşılaşılan Sorunların Analizi

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Geliş tarihi / Date of receipt: 17.09.2024

Kabul tarihi / Date of acceptance: 10.12.2025

**Atf / Citation:** Demir Uslu, Y., Aygün, S., Gökalp, Y., Sevim, B., Şahin K., Koç, S. (2025). Analysis of the problems encountered in the central physician appointment system with DEMATEL method. *BANÜ Sağlık Bilimleri ve Araştırmaları Dergisi*, 7(2), 431-442.  
doi:10.46413/boneyusbad.1551077

### ABSTRACT

**Aim:** The aim of this study is to determine the impact and importance levels of the problems experienced regarding Central Physician Appointment System (CPAS) by using Decision Making Trial and Evaluation Laboratory (DEMATEL) method, which is one of the multi-criteria decision making techniques.

**Material and Method:** In the study, a total of 1485 comments containing the keyword "CPAS" on the şikayetvar.com platform were examined. In addition, current studies in the literature were also utilized. In this framework, a total of 7 criteria were identified. These criteria are; problems arising from the confidentiality and updating of personal data, systemic and technical problems, problems in making control appointments, lack of information about appointments, difficulty in making appointments, problems in reaching the alo 182 line, frequency of appointment cancellations and changes. Three expert opinions were taken during the evaluation of the criteria.

**Results:** As a result of the analysis it was determined that the three most important criteria were; difficulty in making appointments, system and technical problems, and frequency of appointment cancellations and changes.

**Conclusion:** In line with these results, in order to achieve the desired success of CPAS and increase user satisfaction, the barriers to individuals' access to health services should be eliminated.

**Keywords:** Centralized Physician Appointment System, Healthcare, Healthcare Service Accessibility, Multi-Criteria Decision Making, DEMATEL

### ÖZET

**Amaç:** Bu çalışmanın amacı, çok kriterli karar verme tekniklerinden biri olan Karar Verme Deneme ve Değerlendirme Laboratuvarı (DEMATEL) yöntemi kullanılarak Merkezi Hekim Randevu Sistemi (MHRS) ile ilgili yaşanan sorunların etki ve önem düzeylerinin belirlenmesidir.

**Gereç ve Yöntem:** Çalışmada şikayetvar.com platformunda "MHRS" anahtar kelimesini içeren toplam 1485 yorum incelenmiştir. Ayrıca literatürde yer alan güncel çalışmalardan da yararlanılmıştır. Bu çerçevede toplam 7 kriter belirlenmiştir. Bu kriterler; kişisel verilerin gizliliği ve güncellenmesinden kaynaklanan sorunlar, sistemsel ve teknik sorunlar, kontrol randevularının alınmasında yaşanan sorunlar, randevularla ilgili bilgi eksikliği, randevu alma zorluğu, alo 182 hattına ulaşmada yaşanan sorunlar, randevu iptal ve değişikliklerinin sıklığıdır. Kriterlerin değerlendirilmesi sırasında üç uzman görüşü alınmıştır.

**Bulgular:** Analiz sonucunda en önemli üç kriterin; randevu alma zorluğu, sistem ve teknik sorunlar ile randevu iptal ve değişiklik sıklığı olduğu belirlenmiştir.

**Sonuç:** Bu sonuçlar doğrultusunda CPAS'nin istenilen başarıya ulaşması ve kullanıcı memnuniyetinin artırılması için bireylerin sağlık hizmetlerine erişiminin önündeki engellerin ortadan kaldırılması gerekmektedir.

**Anahtar Kelimeler:** Merkezi Hekim Randevu Sistemi, Sağlık Hizmetleri, Sağlık Hizmetlerine Erişim, Çok Kriterli Karar Verme, Dematel



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## INTRODUCTION

Rapid developments in technology have a wide range of effects from daily life to business processes, from education to health services. Especially in the field of health, with the development of technology and digitalisation process, applications such as patient registration systems, appointment procedures and remote health services have become widespread. Digital applications such as the Central Physician Appointment System (CPAS), e-pulse, e-prescription and telemedicine, developed in Turkey in this context, contribute to making healthcare services more accessible and efficient (Topçuoğlu, Kavak & Kaygın, 2022). These developments improve the quality of service delivery in the health sector and increase patient satisfaction.

Many issues such as rapidly developing technological innovations and increasing specialisation in the healthcare sector, rising costs, demographic changes and increasing expectations of patients continuously increase the workload of hospitals and make their operations more complex. Various initiatives should be taken to evaluate the quality of health care delivery processes in terms of service and process (Bener, Alayoğlu, Çatan, Torun & Yılmaz, 2019). The Health Transformation Programme was launched in 2003 in order to ensure more effective and efficient access to health services in Turkey (Özata, 2009). Within the scope of this programme, CPAS is one of the systems rapidly disseminated by the Ministry of Health, aiming to provide services to all citizens. With CPAS, it is aimed to facilitate individuals' access to health services and to enable hospitals to provide more effective and efficient services.

CPAS provides services through the official website, mobile applications and ALO 182 call centre, enabling appointments to be made to all public health institutions in Turkey. It allows patients to make appointments in the medical branch they want and at the hospital or physician they prefer, and offers alternative options in line with their appointment requests. Until 2019, 53 million citizens made 490 million appointments through CPAS, these data reveal that CPAS is actively used by a wide range of users. Despite this intensive use of the system, identifying and solving existing problems will further improve citizens' access to health services. When the number of doctoral applications in OECD

countries is analysed, Turkey ranks seventh among 29 OECD countries with 8 doctoral applications per capita (OECD, 2024). This situation shows that the demand for health services in Turkey is high and citizens' expectations from health services have increased. However, the problems experienced in systems such as CPAS prevent this demand from being met effectively. Therefore, identifying and solving the current problems of CPAS is of great importance in terms of making access to health services more effective and efficient. Thus, the satisfaction of citizens who want to benefit from health services will increase and the health system will be more sustainable.

One of the biggest problems encountered in CPAS is that users cannot find an appointment on the system. This problem usually arises due to high demand for health services or technical failures. The problem of not being able to find an appointment prevents patients from accessing health services (Topçuoğlu et al., 2022). Özkan and Çiftçi Karan (2024) examined Presidential Communication Centre and Ministry of Health Contact Centre applications in 2022 and stated that users frequently encounter the problem of not finding an appointment and this negatively affects the accessibility of health services. In the study, it was stated that the highest complaint in 2021 was not being able to get an appointment from CPAS, and the same complaint continued in 2022. Özmen and Ocakdan (2022), in their study aiming to evaluate the satisfaction status of patients and employees regarding city hospitals, were carried out in four stages (identification, screening, eligibility and inclusion) based on the PRISMA protocol. In the study, it was stated that the appointment time, inability to find an appointment on the desired date and the difficulties experienced in making an appointment were the main reasons for the low satisfaction rate. Tekinalp and Şahinöz (2021) emphasised that the appointment system used for patients to access healthcare services on time and increase their satisfaction should be online, integrated with CPAS and compatible with patient expectations.

Appointment cancellation stands out as another problem frequently encountered by CPAS users. Users experience various difficulties in cancelling or rescheduling their appointments and this may negatively affect the efficiency of health services. Evirgen and Yorulmaz (2019) investigated the CPAS appointment system in a public hospital

and found that the appointments made were cancelled by citizens and physicians. Disruptions in appointment cancellations are often related to system errors or complexities in the user interface. Failure to notify appointment cancellations on the system in a timely manner causes other patients who want to receive health services from the relevant branches to be unable to find an appointment and causes loss of workforce in the work schedule of physicians (Çolak, Tekgöz & Çınar, 2020). Since appointment services in all public hospitals in Turkey are managed by CPAS, this problem needs to be solved, the appointment cancellation process needs to be made more user-friendly and cancellation policies need to be clearly stated (Küçük, Demirci, Kerman & Soner Özsoy, 2021). Frost, Jenkins & Emmink, (2017) found that one of the reasons for non-attendance at outpatient clinics is canceled appointments by medical secretaries.

CPAS users frequently encounter lack of information. Users do not have sufficient information about details, changes or reminders about appointments. This can lead to patients forgetting appointments or disruptions in their access to health services due to lack of information. The level of knowledge and awareness of the public about CPAS plays a critical role for patients to receive faster and better quality services from health institutions (Demirci & Uğurluoğlu, 2022). In the study conducted by Gündoğdu & Erkek (2022) using the field research method, it was found that there was a weak positive relationship between the knowledge levels of the participants and e-health satisfaction and health service satisfaction. The authors stated that the increase in the knowledge level of the participants led to a positive increase in their satisfaction with e-health and health services. In the study conducted by Kuh & Erdem (2021), it was determined that CPAS is the most known and used application among the applications of the Ministry of Health, and for this reason, it was stated that correct information and usage about the application is critical for system efficiency. In this context, Demirdağ & Tuğrul (2022) emphasise in their study that the public should be informed about the methods of making CPAS appointments and applying to hospitals. Miller & Ambrose (2019) found that common reasons for missing an appointment include the long time between planning and the appointment day, and individuals forgetting their appointments. In order to reduce the number of

people who do not show up and cancel appointments, it was stated that communication via phone, e-mail or text message should be established. Boone, Celhay, Gertler, Gracner & Rodriguez, (2022) found that appointment reminders are effective in increasing the ability to see more patients in healthcare organizations.

Access problems in CPAS are an important problem that makes it difficult for users to access health services. In order to provide faster and better quality health services to patients, a system infrastructure with sufficient capacity is required (Kaya & Eke, 2023). Access problems may occur due to system maintenance work, technical failures or server problems. This can restrict access to health services by preventing patients from making appointments or accessing existing appointments. Ülkü, Karaavcı, Elbir & Demirtaş, (2024) emphasised that system access problems negatively affect the user experience and may lead to delays in emergency health situations. In the study conducted by Kırac (2019), the level of knowledge of citizens about appointment systems and the contribution of appointment systems in accessing health services were evaluated. In the research conducted, it was determined that the CPAS appointment system was inadequate and there were problems in making an appointment through the system. In order to minimise access problems, it is essential to increase investments in digital health services, regularly maintain and update the system infrastructure, and provide fast support and solution mechanisms (Özmen & Güleç, 2019). Casasola Balsells et al. (2019) evaluated the accessibility level of online appointment scheduling in primary healthcare services and emphasized that technical infrastructure should be improved to increase system accessibility. Zhao, Yoo, Lavoie, Lavoie & Simoes (2017) reported that there is a growing trend towards the adoption of web-based appointment systems. It is also stated that there is a greater need for web-based appointment scheduling.

Alo 182 is CPAS's own support line and is a widely used channel where users can apply for procedures such as appointments and information updates. However, the problems experienced in this service make it difficult for users to receive support (Şantaş, Şantaş & Erigüç, 2019). Alo 182's problems such as long waiting times, insufficient information and response delays increase the difficulties faced by users in appointment processes. Özer and Polat (2024), in

the data they collected in a public hospital in 2022 through random sampling, stated that the attitude of call centre employees towards patients, the level of access to the call centre and the level of knowledge of call centre employees on the subject affect the efficiency and satisfaction of patients with the system. In the study conducted by Parlak Ulu and Uludağ (2023), when the participants using CPAS were asked about the most dissatisfied situation in CPAS, it was seen that about half of the participants answered “I do not find it appropriate that the Alo 182 appointment line is paid”. In another study, Hoşgör, Ülker Dörttepe & Güngördü (2022) found that the main complaints about the call centre were “Alo 182 communication difficulty”, “Alo182 fee” and “ALO 182 CPAS personnel giving wrong information”. In this context, it is of great importance to invest in the training of call centre staff, shorten the call response time and establish a more effective support system in order to improve the quality of the Alo 182 service.

Management of personal information in CPAS is also an important problem. The integration of information technology systems into healthcare is not a new concept, but the ever-growing solutions offered by the information technology field can lead to some problems in hospital-based information systems (Chaves et al., 2021). These problems may hinder the functioning of eHealth and health systems and may cause incorrect, inaccurate or incomplete information to be provided to system users such as patients and doctors (Çoban & Tüysüz, 2019). CPAS is one of the various information systems established by the Ministry of Health. It is extremely important that there are no problems in the functioning of the application and that users do not experience difficulties in updating or editing their personal information in order to access the right service. In this context, the processing of personal health data is also of great importance for medical data security (Yüksel, 2019). In particular, individuals who use CPAS through various internet platforms have stated that they have difficulties in updating their personal information on the system and that this situation disrupts the health service they want to receive. Therefore, it is essential to carry out intensive studies on the deficiencies in healthcare applications, to eliminate functional errors and to address usability problems (İnal & Ercil Cagiltay, 2019).

Making a follow-up appointment is another problem experienced in CPAS. Control

appointments, which should be taken at certain intervals to follow up the treatment process of patients, often become a situation that is difficult to find on the system (Seyedi, Eshghi & Carter 2024). Difficulties in making follow-up appointments disrupt patients' treatment processes and make it difficult to monitor their health status. Yüksel & Özveri (2019), in their study evaluating the process management of outpatient clinic services in hospitals, stated that one of the criteria with a high rate of dissatisfaction was “Making a Control Appointment”. In this context, in order to solve the problem, it is important to make control appointments more accessible and to make improvements in the system so that users can easily make such appointments (Kantetz, 2019).

As a result of the literature review, the following points draw attention:

- i. CPAS, which gathers all appointment making methods in a single centre, provides many advantages in the planning and delivery of health services.
- ii. There are a number of problems that prevent CPAS from meeting expectations.
- iii. It may not be possible to intervene in all of the issues that prevent CPAS from providing the requested health service. Therefore, it is necessary to determine the importance weights of the identified obstacles.
- iv. However, when the existing literature is examined, it is seen that the studies on this subject are insufficient in terms of emphasising the problems and supporting the solutions.

The aim of this study is to determine the problems experienced regarding CPAS and to determine the effects of these problems on each other and their importance levels. In this process, problems were tried to be identified both through the Şikayetvar.com platform and through a literature review. The 7 problems identified were analysed by DEMATEL method, one of the multi-criteria decision making techniques.

## MATERIAL AND METHOD

### Research Type

A technique called multi-criteria decision making (MCDM) was created to help people make judgments when there are multiple criteria and options. Making the correct choice is the goal of

MCDM approaches. The best option among the options is chosen, ranked, or categorized for this reason (Paksoy, 2017).

In this study, DEMATEL method, one of the multi-criteria decision making techniques, was used to determine the impact and importance

levels of the criteria on each other. In this research article, problems related to CPAS were examined on the şikayetvar.com platform between May 13, 2024 and May 13, 2023. At the same time, problems related to CPAS were identified through literature review.

**Table 1. Criteria and Criterion Descriptions**

Criteria	Explanations	Number of Comments	References
Problems Arising from Privacy and Updating of Personal Data	It expresses the difficulties faced by individuals in updating their data and protecting personal data in CPAS.	78	(Çoban & Tüysüz, 2019; Yüksel, 2019; İnal & Ercil Cagiltay, 2019; Chaves et al. 2021)
Systemic and Technical Issues	It is defined as operational, technical and person-related problems encountered by patients in appointment scheduling processes in CPAS.	321	(Kıraç, 2019; Özmen & Güleç, 2019; Kaya & Eke, 2023; Ülkü et al., 2024)
Problem Making a Control Appointment	It refers to the problems they experience in scheduling appointments that they need to make within a certain period of time after the examination or treatment.	31	(Yüksel & Özveri, 2019; Kanitez, 2019; Aydın et al., 2024; Seyedi et al., 2024)
Lack of Information on Appointment	It is defined as problems arising from not informing the patient about the appointment date, place and physician information in appointment processes in CPAS or not providing information about canceled appointments.	42	(Miller & Ambrose, 2019; Kuh & Erdem, 2021; Demirci & Uğurluoğlu, 2022; Gündoğdu & Erkek, 2022; Demirdağ & Tuğrul, 2022; Özkan & Çiftçi Karan, 2024)
Difficulty Making an Appointment	It can be expressed as the inability of individuals to make an appointment for the date, physician or hospital they want. At the same time, the insufficient number of physicians, health institutions or specialties is also included in this criterion.	679	(Tekinalp & Şahinöz, 2021; Topçuoğlu et al., 2022; Demirci & Uğurluoğlu, 2022; Özkan & Çiftçi Karan, 2024; Özmen & Ocakdan, 2024; Aydın et al., 2024)
Problem Reaching Alo 182 Line	In the process of appointment scheduling via telephone in CPAS, problems arising from personnel, long waiting times due to line congestion, the application being paid, language and communication problems, lack of return and follow-up are expressed as problems.	86	(Şantaş et al., 2019; Küçük et al., 2021; Hoşgör et al., 2022; Parlak Ulu & Uludağ, 2023; Özer & Polat, 2024)
Frequency of Appointment Cancellations and Changes	Appointments canceled or changed by the system in CPAS are defined as problems experienced due to the complexity of appointment cancellation and change processes.	248	(Kıraç, 2019; Evirgen & Yorulmaz, 2019; Çolak et al., 2020; Küçük et al., 2021; Özkan & Çiftçi Karan, 2024)
		1485	

## Study Population and Sample

The study was designed within the framework of determining the problems experienced in CPAS and determining their effects on each other and their importance weights. The problems experienced in this process were determined by reviewing the şikayetvar.com platform and the literature.

Within the scope of the study, a total of 1485 comments containing the keyword “CPAS” between 13 May 2024 and 13 May 2023 on the şikayetvar.com platform were examined to identify the problems. Due to the large volume of comments available, the analysis period was selected with consideration of the time required for a detailed evaluation. Additionally, the timeframe was chosen to align with the implementation of the approved appointment system introduced by the Ministry of Health on 13 May 2024, covering a retrospective one-year period. In this framework, a total of seven different criteria themes were identified. The information, including the number of comments for each criterion, is shown in Table 1. In this framework, a total of 7 different criteria themes were identified. The information including the number of comments of the criteria is shown in Table 1.

The determined criteria were evaluated by experts in the field of health management in the field, policy processes and academia through DEMATEL questionnaires. Within the scope of the study, 3 experts were consulted. The three experts interviewed had at least 10 years of experience and were academicians, Ministry of Health staff and hospital managers. Similar studies in the literature suggest that experts should have at least 5 years of experience and at least 3-6 experts should be involved in the evaluation. (Çalık, 2022; Uslu, Şahin, Aygün & Tuna, 2023; Uslu, Artan, Aygün, Özkan & Oğuz, 2024).

## Data Collection Tools

The data in the study were obtained as a result of the evaluations of experts in the field with various characteristics of the problems identified by using the şikayetvar.com platform and the literature. In this process, the experts included in the study were informed by the researcher about the evaluation tools, evaluation style and the study.

## Ethical Consideration

This study does not require ethics committee

permission as it does not use data, scales or subjects.

## Data Analysis

The analysis of the study was carried out by DEMATEL method. DEMATEL method, which is one of the multi-criteria decision-making techniques, reveals the causal relationships between the criteria with the help of matrices. This method defines the relationships between the criteria through matrices and shows the strength of these relationships. DEMATEL method is performed in 5 steps (Lin & Tzeng, 2009; Baruah, Raj, Ray, & Chakravorty, 2012; Mardani et al., 2015).

Step 1: Direct relationship matrix is created

Within the scope of the DEMATEL method, expert opinions were taken and a five-level dematel evaluation scale between 0 and 4 was utilized. In this scale, a value of 0 indicates that there is no effect between the criteria, while a value of 4 indicates that there is a very high effect between the criteria. The following formula (1) is used to construct the direct relationship (A) matrix. In addition, the value k in the formula refers to the number of experts.

$$A = \frac{1}{n} \sum_{k=1}^n A_{ij}^k \quad (1)$$

Step 2: A normalized direct relationship matrix is created

$$x = kx A \quad (2)$$

$$k = \frac{1}{\sum_{j=1}^n a_{ij}}$$

The above formula is used to construct the normalised direct relationship matrix (M). The diagonal values of the M matrix are zero. For other values, the smallest value in rows and columns is taken into account.

Step 3: The total relationship matrix is created

$$T = x(1 - x)^{-1} \quad (3)$$

In the following process, the total relationship matrix (S) is created from the normalised direct relationship matrix. The following formula is taken into account in the construction of the S matrix. In addition, the unit matrix in the formula is denoted by I.

Step 4: Creating a causal diagram

From the values obtained by forming the total relationship matrix, the sum of the columns forms

the R value and the sum of the rows forms the D value. By calculating these values, D-R and D+R values are also calculated. Thus, the effect of each criterion on the other criteria is determined. In addition, the level of relationship of each criterion with other criteria is determined.

**Step 5: Calculation of weights**

Finally, the D and R values are taken into account in the calculation of the weights (w). When calculating the weight, the D+R value of the criterion in question is divided by the sum of the D+R values of all criteria. Subsequently, a ranking is made from the criterion with the

highest weight value to the criterion with the lowest weight value.

$$W = \frac{D_i+R_i}{\sum_{i=1}^n D_i+R_i} \tag{4}$$

**RESULTS**

In the analysis process, firstly, the experts evaluated the DEMATEL questionnaire between 0 and 4. In the second stage of the analysis, the integrated matrix was formed by averaging the evaluation scores of all experts. The Integrated Matrix is shown in Table 2.

**Table 2. Integrated Matrix**

Criteria Number	C1	C2	C3	C4	C5	C6	C6	C7
C1	0.00	3.00	1.33	1.00	4.00	2.00	2.67	2.66
C2	3.67	0.00	3.00	1.00	4.00	3.67	3.67	3.66
C3	1.00	1.00	0.00	2.33	3.33	2.67	1.33	1.33
C4	1.00	1.00	2.00	0.00	3.33	2.00	2.67	2.66
C5	4.00	4.00	4.00	4.00	0.00	3.67	4.00	4.00
C6	1.33	2.33	2.00	2.67	4.00	0.00	3.33	3.33
C7	1.67	2.67	1.33	2.67	4.00	2.67	0.00	0.00

In the third stage of the analysis, the values in the direct effect matrix were normalised by the largest values in the rows or columns of the relevant matrix. Normalisation was achieved by dividing

each value by the sum of the largest column or row. The normalised direct relationship matrix is shown in Table 3.

**Table 3. Normalised Direct Relationship Matrix**

Criteria Number	C1	C2	C3	C4	C5	C6	C6	C7
C1	0.00	0.13	0.06	0.04	0.17	0.08	0.11	0.11
C2	0.15	0.00	0.13	0.04	0.17	0.15	0.15	0.15
C3	0.04	0.04	0.00	0.10	0.14	0.11	0.06	0.05
C4	0.04	0.04	0.08	0.00	0.14	0.08	0.11	0.11
C5	0.17	0.17	0.17	0.17	0.00	0.15	0.17	0.16
C6	0.06	0.10	0.08	0.11	0.17	0.00	0.14	0.14
C7	0.07	0.11	0.06	0.11	0.17	0.11	0.00	0.00

In the fourth stage of the analysis, the total relationship matrix was created. In this process, D<sub>i</sub>+R<sub>i</sub> value expresses the degree of importance of the criteria. D<sub>i</sub>-R<sub>i</sub> value means that the criteria with positive values affect the other criteria, and the positives affect the other negative criteria as a

comparative group. Negative values are affected by other criteria. While constructing the total relationship matrix (S), the equation  $S = M(I - M)^{-1}$  was used. The total relationship matrix is shown in Table 4.

**Table 4. Total Relationship Matrix (S)**

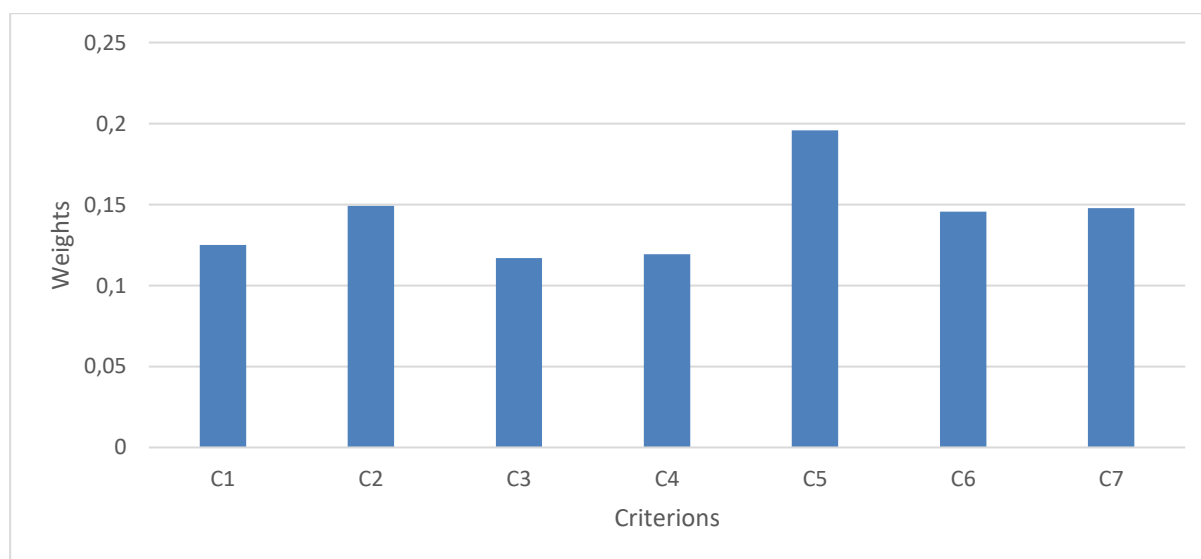
Criteria Number	C1	C2	C3	C4	C5	C6	C6	C7
C1	0.18	0.31	0.24	0.23	0.42	0.30	0.33	0.33
C2	0.36	0.24	0.35	0.28	0.50	0.41	0.43	0.42
C3	0.18	0.20	0.15	0.25	0.35	0.28	0.24	0.24
C4	0.19	0.20	0.23	0.16	0.35	0.26	0.29	0.29
C5	0.40	0.43	0.42	0.42	0.42	0.46	0.49	0.48
C6	0.24	0.29	0.28	0.31	0.44	0.23	0.37	0.37
C7	0.25	0.30	0.25	0.30	0.44	0.33	0.24	0.24

In the other stage of the analysis, D, R, D+R, w and the rankings of the criteria were determined through the total relationship matrix. Criteria weights weights and rankings are shown in Table 5.

**Table 5. Criteria Weights and Ranking**

Criteria Number	D+C	D-C	W	Ranking
C1	3.81	-0.22	0.1251	5
C2	4.54	-0.60	0.1491	2
C3	3.55	0.27	0.1169	7
C4	3.63	0.26	0.1193	6
C5	5.95	-0.10	0.1957	1
C6	4.43	0.10	0.1456	4
C7	4.50	0.29	0.1478	3

**Figure 1. Criteria Weights**



The representation of the criterion weights obtained as a result of the study is as shown in Figure 1. It was determined that the criterion that

affected the patients the most in not being able to make an appointment was "Difficulty in Making an Appointment" with C5, and the criterion that

had the least effect was " Problem Making a Control Appointment " with C3.

## DISCUSSION

Within the framework of the analyses, the criterion of not being able to make an appointment was found to be the criterion with the highest impact level among the problems encountered by individuals in CPAS. Şantaş et al. (2019) examined complaints and comments about hospitals in their study. In the study, it was determined that the most important problem was that patients could not get an appointment. In the study conducted by Uğurlu & Beydağ (2022), it was aimed to determine the opinions and attitudes of pregnant women regarding prenatal screening tests. It was revealed that pregnant women had difficulties in making appointments for prenatal screening tests. Çetin Aslan (2021) conducted a study examining the impact of the COVID-19 pandemic on individuals' access to health services. In the study, it was determined that the most common problems encountered in individuals' inability to receive health care services were the concern of catching COVID-19 and inability to find an appointment in health institutions. In the study conducted by Özer (2024), patient satisfaction was measured in CPAS in a public hospital. As a result of the study, it was emphasised that the number of patients who reported that they could not get an appointment to the hospital, physician and date they wanted was high.

According to the results of the study, it was found that among the problems encountered by individuals in CPAS, the second criterion with the level of impact was found to be systemic and technical problems. Operational, technical and user-related problems cause patients to experience disruptions in appointment processes. This situation makes it difficult for individuals to access health services and leads to a decrease in patient satisfaction rates. Polat (2023) conducted a study examining the satisfaction level of patients using CPAS. 12.62% of the users stated that they did not know how to use the system and 2.91% stated that they did not know how to make an appointment. It was also stated that the system interface was not understandable. In the study conducted by Topçuoğlu et al. (2022) in which the effectiveness of CPAS is analysed, it is emphasised that there are problems with the system. Aydın (2021) conducted a study on the

problems experienced by Syrian migrants in accessing health services. When the results of the study were evaluated, it was determined that providing only Turkish service in the CPAS application caused patients to have problems in the appointment making process. This situation constitutes a major obstacle especially for patients who do not speak Turkish. Yüksel & Özveri (2019) conducted a study evaluating the appointment system. In the study, it was stated that patients could not get an appointment due to the problems experienced in the e-appointment system (Yüksel & Özveri, 2019). In order to achieve the expected success of the system, the number of appointments opened in the system can be estimated on a unit basis by taking into account the number of applications in previous years (Bucak, Almis, Doğan, & Turgut, 2018).

According to the results obtained from the analyses; it was concluded that the third criterion with the level of impact among the problems encountered in CPAS is the frequency of appointment cancellations and changes. Although the cancellation of appointments is sometimes systemic, it is sometimes caused by the physician or hospital. Failure to inform the patient about cancellations caused by the physician or the hospital also brings along some problems. In addition, the system does not allow an appointment for the same branch within 15 days. However, as a result of the patient going to the health institution in an emergency, the existing outpatient appointment is also cancelled. In the study conducted by Kartal (2015) in which CPAS was evaluated by dentists, spontaneous cancellation of the appointment was among the problems encountered due to CPAS. Kurşun & Kaygusuz (2018) aimed to evaluate CPAS in terms of accessibility and satisfaction with their study. Accordingly, it was stated by the participants that appointment changes were made and individuals were not informed about these changes. It was stated that this situation would cause a decrease in the satisfaction level. In the study conducted by Aydın et al. (2024), it was concluded that the main administrative problems related to health service delivery were the delay in appointment time, incorrect application and cancellation.

## Study Limitations

Within the scope of the study, only CPAS, where appointments are made for institutions providing health services in Turkey, was analysed.

Appointment systems used by private and foundation health institutions were not included in the evaluation. Therefore, the problems within the scope of the research can only be evaluated within the framework of this research. This situation constitutes an important limitation of the research.

## CONCLUSION

According to the results of the analysis, the problem of finding an appointment was determined as the most important criterion. Systemic and technical problems were identified as the second, the frequency of appointment cancellations and changes as the third, the problem of reaching the ALO 182 line as the fourth, and the problems arising from the confidentiality and updating of personal data as the fifth. The problem of making a control appointment was found to be the least important criterion. Although the CPAS system is an important application for individuals to be able to make hospital appointments, it has not yet met the desired level of expectations. In addition to the inadequacy of the number of physicians per capita, well-educated physicians and health personnel are needed when individuals cannot reach hospital appointments. In addition, the dissemination of a holistic perspective in the provision of health services plays an important role in eliminating technical and practical deficiencies. Individuals plan appointments through the system in line with their needs. However, the density of health institutions, the low number of physicians and the high demand for some specialties cause these problems. Thus, problems arise with individuals' access to health services. In line with these results, focusing on the problems of not finding an appointment, systemic and technical problems, and the frequency of appointment cancellations and changes will contribute to achieving the desired success of the CPAS system and increasing user satisfaction. It is thought that this study will contribute to the literature in many ways mentioned above. However, new studies are needed to obtain and rank the problems encountered in CPAS by patients and service providers through surveys. In addition, it is recommended that the reasons for the criterion of not finding an appointment, which is found to be the most important according to the results of the study, should be investigated in detail.

## Ethics Committee Approval

This study does not require ethics committee permission as it does not use data, scales or subjects.

## Author Contributions

Idea/Concept: Y.D.U.; B.S.; K.Ş.; Design: B.S.; K.Ş.; Supervision/Consulting: Y.D.U.; Analysis and/or Interpretation: S.A.; Y.G.; Literature Search: B.S.; K.S.; Writing the Article: C.K., F.E.; Critical Review: Y.D.U.; S.A.; Y.G.

## Peer-review

Externally peer-reviewed.

## Conflict of Interest

The authors have no conflict of interest to declare.

## Financial Disclosure

The authors declared that this study has received no financial support.

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