



RESEARCH ARTICLE

F.U. Med.J.Health.Sci.
2025; 39 (3): 192 - 195
<http://www.fusabil.org>

Burak ATEŞSAÇAN^{1, a}
Ömer Faruk RAHMAN^{2, b}
Şahin BOZOK^{2, c}

¹ Burdur State Hospital,
Department of
Cardiovascular Surgery,
Burdur, TÜRKİYE

² İzmir Bakırçay University,
Faculty of Medicine,
Department of
Cardiovascular Surgery,
İzmir, TÜRKİYE

^a ORCID: 0000-0002-3147-7843

^b ORCID: 0000-0002-4248-2867

^c ORCID: 0000-0002-1256-5055

Incorrect Referrals to the Cardiovascular Surgery Outpatient Clinic: Causes and Proposed Solutions

Objective: This study aimed to determine the rate and causes of incorrect referrals to the cardiovascular surgery outpatient clinic.

Materials and Methods: In this retrospective study, records of patients who applied to the cardiovascular surgery outpatient clinic via the Central Physician Appointment System (CPAS) between January 2024 and July 2024 were examined. Patients who should have initially applied to the cardiology outpatient clinic, based on their symptoms such as palpitations, exertional chest pain, echocardiography follow-up, and routine cardiac evaluations, were classified as incorrect referrals. They were then categorized according to the reasons for the incorrect referral and the method of application.

Results: A total of 1381 patients (809 females, 572 males) met the inclusion criteria mean age (53.26 ± 17.34 years). Of these, 1180 patients (85.4%) comprised the correct referral group, while 201 patients (14.6%) comprised the incorrect referral group. Of the incorrect referrals, 168 (83.6%) were made via the Web/Mobile appointment channel, and 33 (16.4%) through the ALO 182 Call Center appointment channel. The most common cause was the inclusion of the term "heart" in the department name, accounting for 122 incorrect referrals (60.7%). Incorrect referrals due to the CPAS system comprised 9% (18 referrals) of the total. Those based on patient preference comprised 91% (183 referrals).

Conclusion: Most incorrect referrals are predominantly attributable to patient preference. Simplifying and clarifying the department names, providing detailed information on the specific department within the CPAS system, and implementing strategies for improving health literacy could contribute significantly to reduce the rates of incorrect referrals.

Key Words: Cardiovascular surgery, cardiology, central physician appointment system, outpatient clinic, referral and consultation

Kalp ve Damar Cerrahisi Polikliniğine Yapılan Yanlış Başvurular: Nedenler ve Çözüm Önerileri

Amaç: Bu çalışmada, kalp ve damar cerrahisi polikliniğine yapılan yanlış başvuru oranlarının belirlenmesi ve bu başvuruların sebeplerinin ortaya konulması amaçlanmıştır.

Gereç ve Yöntem: Çalışmamızda Ocak 2024 – Temmuz 2024 tarihleri arasında kalp ve damar cerrahisi polikliniğine Merkezi Hekim Randevu Sistemi (MHRS) aracılığıyla başvuran hastalar geriye dönük olarak incelendi. Çarpıntı, eforla gelen göğüs ağrısı, ekokardiyografi kontrolü ve rutin kalp kontrolleri gibi semptomlar için öncelikle kardiyoloji polikliniğine başvurusu gereken hastalar yanlış başvuru olarak sınıflandırıldı. Hastalar, yanlış başvuru sebeplerine ve başvuru yöntemlerine göre gruplandırıldı.

Bulgular: Çalışmada dahil olma kriterini karşılayan 1381 hasta için (809 kadın, 572 erkek) ortalama yaş 53.26±17.34 idi. Doğru başvuru grubunda yer alan hasta sayısı 1180 (%85.4) iken hastaların 201'i (%14.6) ise yanlış başvuru grubunda yer aldı. Yanlış başvurunun 168'inin (%83.6) web/mobil randevu kanalı ile, 33 başvurunun (%16.4) ise ALO 182 Çağrı Merkezi randevu kanalı aracılığıyla gerçekleştiği saptandı. Yanlış başvurular sebeplerine göre kategorize edildiğinde en sık yanlış başvuru nedeninin 122 yanlış başvuru (%60.7) ile "branş isminde kalp kelimesinin yer alması" olduğu görüldü. MHRS sistemi kaynaklı yanlış başvuruların oranı %9 (18 başvuru) idi. Hasta tercihi kaynaklı yanlış başvuruların oranı ise %91 (183 başvuru) idi.

Sonuç: Bu çalışmada yanlış başvuruların büyük oranda hasta tercihinden kaynaklandığı ortaya konmuştur. Branş isimlerinin sade ve anlaşılır hale getirilmesi, MHRS sisteminde başvuru branşa ilişkin detaylı bilgilendirmelerin yapılması ve sağlık okuryazarlığının iyileştirilmesine yönelik uygulamaların hayata geçirilmesi, yanlış başvuruları oranlarının engellenmesine katkı sağlayabilecek adımlardır.

Anahtar Kelimeler: Kalp ve damar cerrahisi, kardiyoloji, merkezi hekim randevu sistemi, poliklinik, yönlendirme ve danışma

Introduction

In outpatient clinics, it is crucial that patients apply to the appropriate clinics based on their complaints and receive timely healthcare services. Over time, the increasing population, challenges in implementing the healthcare stratification system, and lack of adequate number of physicians have resulted in growing congestion in outpatient clinics. In 2010, the Turkish Ministry of Health introduced the Central Physician

Correspondence

Burak ATEŞSAÇAN
Burdur State Hospital,
Department of
Cardiovascular Surgery,
Burdur - TÜRKİYE

b_atessacan@hotmail.com

Appointment System (CPAS) as part of the Health Transformation Project. The main objectives set by the Ministry of Health for this system are to reduce the pre-examination waiting time, decrease crowding within hospitals, direct patients to the appropriate clinics based on their complaints, and prevent the loss of physician manpower (1).

Despite the existence of similar systems on a local scale worldwide, the absence of a comparable project that serves the entire country further underscores the value and significance of the CPAS. Recognized as one of the 20 fundamental public services by the European Union, the CPAS has covered all 81 provinces of Turkey since 2012 (2). Despite all these advantages, the CPAS is yet in the developmental phase.

It was reported that in 2023 the total number of applications made to physicians in Türkiye was 973,519,087. That year, 43.3% of these applications were directed to primary healthcare institutions, whereas 56.7% were directed to secondary and tertiary healthcare institutions (3). In 2024, the CPAS system generated 186,842,035 appointments for initial examinations in Türkiye's hospitals. Of these appointments, 164,973,255 were fulfilled, whereas 21,868,780 appointments were missed as patients did not apply (4). Considering that the number of appointments significantly exceeds the country's population, missed appointments and incorrect referrals represent a substantial barrier to accessing necessary healthcare services.

The aim of this study was to determine the frequency of patients who, although primarily requiring evaluation in the cardiology outpatient clinic, were directed to the cardiovascular surgery outpatient clinic via the CPAS for various reasons, and to analyze the potential causes of these incorrect referrals.

Materials and Methods

Research and Publication Ethics: The study was conducted following the approval of the Ethics Committee of Isparta University Faculty of Medicine (meeting no: 79, decision no: 6, dated 13.09.2024). It was performed in accordance with the ethical standards of the national research committee and the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Patient applications to the cardiovascular surgery outpatient clinics of Burdur State Hospital via the CPAS between January 2024 and July 2024 were retrospectively reviewed using electronic patient records. For patients with multiple applications during the study period, only the first application was considered. The applications were categorized into two groups: correct referrals and incorrect referrals. Incorrect referral was defined, as described in our previous study, as a situation in which a patient who should have initially applied to the cardiology. Among the 1381 patients who met the inclusion criteria (809 females, 572 males), the mean age was 53.26 ± 17.34 years. Of these, 1180 patients (85.4%) comprised the correct referral group, whereas 201 patients (14.6%) were classified as incorrect referrals. Further, 58.6% of the patients were females and 41.4% were males. The median age in the incorrect referral group was 49 years, compared to 55 years in the correct referral group; this difference in age between the groups was statistically significant ($p = 0.003$) (Figure 1). Among male patients, 15.2% (87 patients) were categorized in the incorrect referral group, whereas among female patients, 114 (14.1%) were categorized in the incorrect referral group. No statistically significant differences in sex distribution were observed between the groups ($p = 0.562$). The distribution of age and sex variables according to the referral groups is shown in Table 1. Further analysis of the incorrect referral group revealed that 168 out of 201 applications (83.6%) were made via the Web/Mobile appointment channel, whereas 33 applications (16.4%) were made through the ALO 182 Call Center (Figure 2). When the causes for incorrect referrals were categorized, the most common cause was the inclusion of the term "heart" in the department name, accounting for 122 incorrect referrals (60.7%). The number of patients who applied to the cardiovascular surgery clinic because they were unable to secure an appointment with the cardiology department was 57 (28.4%). Seventeen patients (8.5%) were misdirected via ALO 182 Call Center, and five patients (2.5%) were categorized as incorrect referrals due to other reasons (Figure 3). The proportion of incorrect referrals due to the CPAS system was 9% (18 referrals), whereas incorrect referrals due to patient preference accounted for 183 applications (91%) (Figure 4).

Table 1: Distribution of age and sex variables among the Incorrect and Correct referral groups

	Correct Referral	Incorrect Referral	p value
	n = 1180	n = 201	
Age, median (iqr)	55 (26)	49 (32)	0.003*
Sex, n (row %)			0.562 [#]
	Male	87 (15.2)	
	Female	114 (14.1)	

*:Pearson Chi-square test was used for sex. Data are presented as n (%), with row percentages shown in parentheses.

[#]: Mann Whitney U test used for age; median (IQR), IQR: interquartile range". Statistical significance was defined as a p-value less than 0.05.

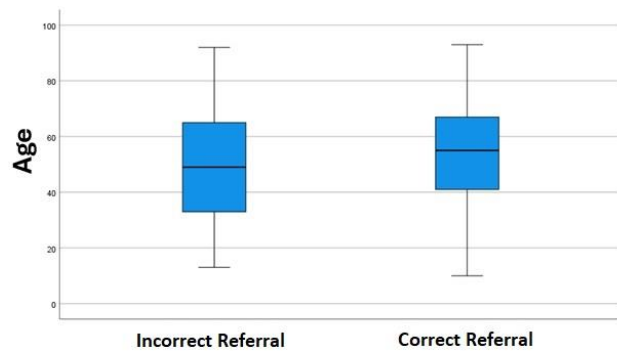


Figure 1. Boxplot representation of age differences between the Incorrect and Correct referral groups



Figure 2. Distribution of incorrect referrals by appointment channel

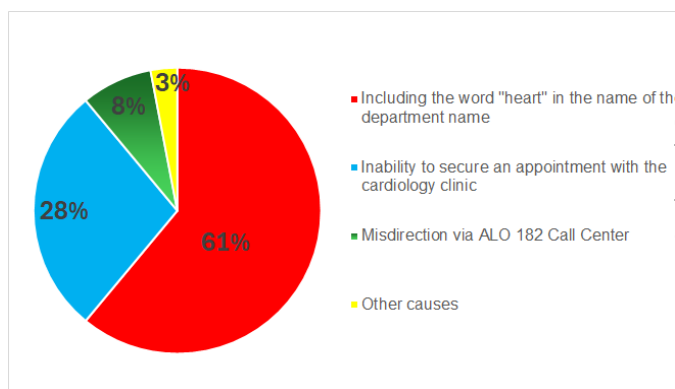


Figure 3. Pie chart representation of the reasons for incorrect referrals

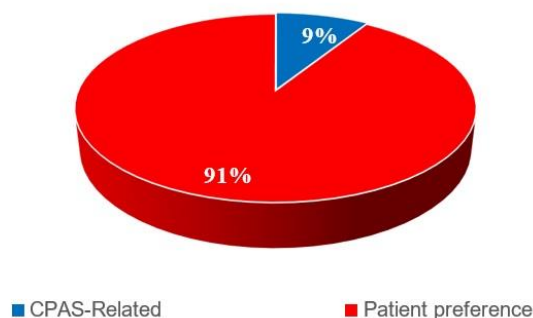


Figure 4. Sources of incorrect referrals

Discussion

Hospital appointment systems have a positive impact on patients' satisfaction with the services they receive. They aid in reducing the number of patients who do not visit and decrease staff workload (6–11), provide timely consultations with physicians, and offer 24-hour access to the system (12–14). Despite all these positive aspects, the disproportionate increase in applications to hospital outpatient clinics has rendered the appointment system inadequate, and patients experience difficulties accessing healthcare services. Patients can only receive appropriate healthcare if they apply to the correct medical specialty outpatient clinic in a timely manner. CPAS, developed by the Turkish Ministry of Health, has been used for this purpose since 2010. However, despite its advantages such as ease of use and the provision of services through multiple channels, the system has proven inadequate in preventing incorrect outpatient clinic applications.

According to the results of the present study, one out of every seven patients who applied via the CPAS made an incorrect application to our clinic. In a previous study conducted by our team, the rate of incorrect referrals to the cardiovascular surgery outpatient clinic was 11.5% of all applications, compared to 18.63% among the applications made through the CPAS (5). These high rates observed in the present study parallel the rates reported in our previous work. The consistently high and persistent incorrect referral rates observed in studies conducted during different time periods underscore the gravity of the problem.

A key finding of the present study, which distinguishes it from our previous research, is its focus on the reasons behind incorrect referrals. The primary factor resulting in incorrect appointments is that patients make their appointments by including the word "heart" in the department name without adequate information about the relevant department. The following recommendations may aid in addressing this issue:

1. Revising the names of specialties to make them more understandable to patients,
2. Clearly defining the areas of interest for both the cardiology and cardiovascular surgery departments within the CPAS system, and
3. Ensuring proper patient guidance through public service announcements and awareness campaigns.

Another significant cause of incorrect referrals is that patients who are unable to secure an appointment with the cardiology department subsequently apply to the cardiovascular surgery outpatient clinic. Three out of every ten patients make incorrect referrals because they are unable to obtain an appointment with the cardiology department. A study conducted by Solmaz et al. (15), showed that 40% of patients applying to the cardiology outpatient clinic via the CPAS did not have "cardiac" complaints. We believe that, in addition to addressing

unnecessary applications to the cardiovascular surgery department, measures aimed at reducing the number of incorrect applications to the cardiology department will indirectly help to prevent incorrect referrals to the cardiovascular surgery outpatient clinic.

In the present study we observed that the incorrect referral group consisted of relatively younger patients, which is consistent with our previous research (5). This finding may be explained by the fact that younger patients have less experience in accessing or utilizing healthcare services. Another possible reason might be that younger individuals tend to use the internet and mobile applications more effectively, enabling them to make independent decisions during the appointment process without the necessity for external guidance. Although this propensity to use digital systems such as the CPAS makes it easier for young individuals to make appointments directly, it may also increase the risk of incorrect specialty selection. This finding may be construed as a negative outlook for young individuals, considering their strong interactive skills and adaptability to digital platforms; however, it indicates that with appropriate informational interventions, the issue of patient misdirection can be effectively resolved.

Another significant finding of this study is the relationship between lower age and misreferrals. Lower age was associated with misreferrals independently of CPAS usage. This may be explained by the possibility that older patients tend to have higher health literacy or are more frequently exposed to the healthcare system.

In the present study, the number of patients who made incorrect applications following the guidance of ALO 182 Call Center personnel was relatively low. Nevertheless, given the importance of preventing each erroneous appointment, we believe that assessing and enhancing the knowledge of the ALO 182 Call Center staff would be beneficial.

The findings obtained in the present study reveal that the majority of incorrect applications made via the CPAS stem from factors external to the system. We observed that only one out of every ten incorrect referrals was attributable to the CPAS itself. Although the CPAS functions correctly, it appears to be inadequate to prevent incorrect referrals alone; in line with our previous recommendations, the implementation of a referral chain model may also be considered.

In conclusion, the results obtained in the present study demonstrated that incorrect outpatient clinic applications made via the CPAS constitute a significant difficulty, primarily due to factors such as inadequate patient knowledge and difficulties in securing appointments. Preventing these incorrect referrals would expedite patients' access to appropriate treatment and enhance the efficiency of the healthcare system. In this regard, measures such as simplifying department names, clearly delineating the focus of each specialty within the CPAS system and its mobile application, providing patient education through public service announcements, and implementing an effective referral chain model may contribute to reducing the incidence of incorrect outpatient clinic referrals.

Reference

1. Republic of Türkiye Ministry of Health. "Central Physician Appointment System (History)". <https://www.mhrs.gov.tr/hakimizda.html> 22.12.2024.
2. Department of Health Facilities. "History of CPAS". <https://www.hospitalerandevu.gov.tr/Vatandas/hakimizda.xhtml> 23.12.2024.
3. T.C. Ministry of Health. "Health Statistics Yearbook 2023". <https://www.saglik.gov.tr/TR-107086/saglik-istatistikleri-yilligi-2023-yayinlanmistir.html> 28.12.2024.
4. T.C. Ministry of Health [@sagliklicozum]. "In 2024, a total of 186,842,035 appointments for initial examinations were scheduled through MHRs. Of these, 164,973,255 were fulfilled, and 21,868,780 were missed as patients did not attend." <https://x.com/sagliklicozum/status/1890392855182459180> 26.12.2024.
5. Rahman ÖF, Ayyıldız F. Analysis of incorrect referrals to the cardiovascular surgery outpatient clinic. *Cardiovascular Surgery and Interventions* 2024; 11:102-107
6. Zhao P, Yoo I, Lavoie J, et al. Web-based medical appointment systems: A systematic review. *J Med Internet Res* 2017;19:4.
7. Lin CKY, Ling TWC, Yeung WK. Resource allocation and outpatient appointment scheduling using simulation optimization. *J Healthc Eng* 2017; 2017:9034737.
8. Yu W, Yu X, Hu H, et al. Use of hospital appointment registration systems in China: a survey study. *Glob J Health Sci* 2013;5:193–201.
9. Lloyd G. An appointment system in a teaching practice. *J R Coll Gen Pract* 1974; 24: 666-668.
10. Ma W-M, Zhang H, Wang N-L. Improving outpatient satisfaction by extending expected waiting time. *BMC Health Serv Res* 2019;19:565.
11. Saghaeiannejad Isfahani S, Bagherian H, Jafari F, et al. Average of fulfilling patients' expectations from interactive voice response appointment systems and websites in selected clinics in Isfahan. *J Mod Med Inform Sci* 2021; 7: 4-13.
12. Walters BA, Danis K. Patient Online at Dartmouth-Hitchcock - interactive patient care web site. *AMIA Annu Symp Proc* 2003;2003:1044.
13. Wang W-Y, Gupta D. Adaptive appointment systems with patient preferences. *Manuf Service Oper Manage* 2011;13: 373-389.
14. Zhang X, Yu P, Yan J. Patients' adoption of the e-appointment scheduling service: A case study in primary healthcare. *Stud Health Technol Inform* 2014; 204:176-181.
15. Solmaz H, Uluda B. Comparison of patients' admissions to the cardiology outpatient clinics between the appointment system and the queue system. *Turk Kardiyol Dern Ars* 2023; 51:188-195.