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# Characteristics of Patients Attending a Cardiology Outpatient Clinic: A Focus on the Turkish Healthcare System

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© Fatma Nihan Turhan Çağlar<sup>2</sup>

<sup>1</sup>Department of Biostatistics, İstanbul University, İstanbul Faculty of Medicine, İstanbul, Turkey

<sup>2</sup>Clinic of Cardiology, İstanbul Bakırköy Dr. Sadi Konuk Training and Research Hospital, İstanbul, Turkey

## Abstract

**Background and Aim:** This study aimed to characterize the clinical and demographic characteristics of patients and to shed light on the Turkish healthcare system.

**Materials and Methods:** A total of 580 consecutive patients were enrolled in this study. The patient demographic and clinical characteristics and complaints were recorded. Blood samples were taken from the antecubital vein after an overnight fast.

**Results:** The mean age of the study population was  $56.20 \pm 15.35$  years, 321 (55.3%) of whom were female, 24.8% of whom had diabetes, 55.5% of whom had hypertension, 35.4% of whom had hyperlipidemia, and 24.6% of whom had coronary artery disease (CAD). The major complaints of the patients were chest pain (157, 27.1%), control of their chronic diseases (114, 19.4), prescription of drugs (101, 17.4%), palpitation (63, 10.9%), high blood pressure (46, 7.9%), dyspnea (35, 6.0%), and other complaints (21, 3.6%). Four (0.7%) patients had no complaints, and 39 (6.7%) patients were referred from other clinics for cardiological examination. Compared with men, women more often presented to the cardiology outpatient clinic with complaints of palpitations, whereas men more often presented to the clinic for prescription of drugs. Men had a greater incidence of hyperlipidemia, CAD, and peripheral arterial disease; higher levels of glucose and creatinine; and lower total cholesterol, low-density lipoprotein cholesterol, and high-density lipoprotein cholesterol concentrations.

**Conclusion:** Most patients went directly to outpatient clinics without visiting primary or secondary health centers.

**Keywords:** Primary health care, tertiary care centers, cardiology

## INTRODUCTION

Since the introduction of the Health Transformation Program in 2003, the healthcare system in Turkey has undergone many fundamental changes.<sup>[1]</sup> The Turkish healthcare system consists of three levels. Primary healthcare services include basic preventive services and outpatient diagnostic and treatment services provided by family health centers. Secondary health services include hospitals where outpatient and inpatient treatment modalities are available. Tertiary

healthcare covers a wide range of healthcare providers, including branch hospitals, teaching hospitals, and university hospitals.<sup>[2]</sup>

The family medicine system is the basis of primary health care. The aim is to establish a closer and better doctor-patient relationship. Everyone is registered with a family doctor in the area where they live because the aim is to diagnose, treat, and follow up at the primary care level. Another main function of the family medicine system is the implementation of a

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**Address for Correspondence:** MD Cennet Yıldız, Department of Biostatistics, İstanbul University, İstanbul Faculty of Medicine, İstanbul, Turkey

**E-mail:** cennet\_yildiz@live.com

**ORCID ID:** orcid.org/0000-0003-2456-3206

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referral chain. The purpose of preventive measures, diagnosis, and treatment of patients at the primary level is to prevent overcrowding in hospitals. Hospital outpatient clinics are full of patients whose problems can be solved at the primary level of the healthcare system. This situation generates unnecessary expenses and reduces the quality of services provided by hospitals. Moreover, it is a large mistake to perceive this system as a one-way referral chain. In reality, the referral chain includes the return of patients to their referral centers. A major reason for an ineffective referral system is the lack of mandatory control and regulation across primary, secondary, and tertiary healthcare services. Because of this lack, patients can directly go to the outpatient departments of secondary and tertiary hospitals.

In this study, we characterized the clinical and demographic features of patients who presented to the cardiology outpatient clinic of a tertiary hospital. We attempted to evaluate the percentage of patients who could have had their problems resolved by primary or secondary healthcare services and to shed light on the Turkish healthcare system.

## MATERIALS AND METHODS

A total of 580 consecutive patients who presented to the cardiology outpatient clinic of a tertiary hospital between April 2023 and June 2023 were enrolled in the study. This study had no exclusion criteria. The patient demographic and clinical characteristics and complaints were recorded. The study was approved by the İstanbul Bakırköy Dr. Sadi Konuk Training and Research Hospital Clinical Research Ethics Committee (decision no: 2023-07-04, date: 03.04.2023) and was conducted according to the Declaration of Helsinki. Informed consent was obtained from the participants.

Diabetes mellitus (DM) was defined as the use of antidiabetic medication or a fasting glucose level  $>125$  mg/dL. Hypertension (HT) was diagnosed when a patient used antihypertensive drugs or had a systolic or diastolic blood pressure greater than 140 mmHg or 90 mmHg. Hyperlipidemia (HL) was diagnosed when the low-density lipoprotein cholesterol (LDL-C) level was  $>100$  mg/dL in patients with coronary artery disease (CAD) or 130 mg/dL in other patients. Patients with regular follow-up at the cardiology clinic were defined as having chronic disease, including HT, chronic coronary syndromes, heart failure, arrhythmias, and cardiac implantable devices. Blood samples from the patients were drawn from the antecubital vein after an overnight fast. Biochemical and hematological evaluations of the collected samples were performed using an AU 2700 (Beckman Coulter Inc., California, USA) and a Sysmex XE 5000 (Sysmex Medical Int., Kobe, Japan).

## Statistical analysis

The normality of the data was determined by assessing the skewness and kurtosis and using the Kolmogorov-Smirnov test. The data with Gaussian and non-Gaussian distributions are expressed as the mean  $\pm$  standard deviation and median and interquartile range, respectively. Comparisons of the two groups were made by the use of independent samples t-test or Mann-Whitney U test according to the distribution of the data. Categorical data are expressed as numbers and percentages and were compared using the chi-square test.

## RESULTS

The mean age of the study population was  $56.20 \pm 15.35$  years, 321 (55.3%) of whom were female and 259 (44.7%) of whom were male. One hundred forty-four (24.8%) patients had DM, 321 (55.5%) had HT, 205 (35.4%) had HL, 141 (24.6%) had CAD, 102 (17.5%) had atrial fibrillation, 33 (5.7%) had heart failure, 17 (2.9%) had peripheral arterial disease, and 152 (26.2%) were smokers. The mean body mass index (BMI) of the patients was  $27.68 \pm 5.23$  kg/m<sup>2</sup>. Ten patients (1.7%) were underweight, 167 (28.8%) had a BMI in the normal range, 242 (41.7%) were overweight, and 161 (27.8%) were obese. The main complaints of the patients were chest pain (157, 27.1%), disease monitoring (114, 19.4%), prescription of medication (101, 17.4%), palpitations (63, 10.9%), HT (46, 7.9%), dyspnea (35, 6.0%), and other complaints (21, 3.6%). Four (0.7%) patients had no complaints, and 39 (6.7%) patients were referred from other clinics for cardiological examination. The biochemical parameters of the patients were as follows: thyroid-stimulating hormone (TSH):  $2.7 \pm 5.13$   $\mu$ IU/mL, glucose:  $113.53 \pm 42.50$  mg/dL, creatinine:  $0.83 \pm 0.38$  mg/dL, total cholesterol (TC):  $192.70 \pm 48.43$  mg/dL, triglyceride (TG):  $150.50 \pm 95.16$  mg/dL, LDL-C:  $113.57 \pm 39.73$  mg/dL, and high-density lipoprotein cholesterol (HDL-C):  $51.38 \pm 23.05$  mg/dL. Two hundred thirty-six (40.7%) patients were using angiotensin-converting enzyme inhibitors and angiotensin receptor blockers, 316 (54.5%) patients were using beta-blockers, 156 (26.9%) patients were using calcium channel blockers, 75 (12.9%) patients were using spironolactone, 66 (11.4%) patients were using loop diuretics, and 197 (34%) patients were using statins.

We did not find any differences between women and men with respect to age, BMI, number of overweight or obese patients, presence of atrial fibrillation, heart failure, DM, HT, TSH, or TG levels. Compared with men, women applied more frequently to cardiology outpatient clinics with complaints of palpitations, whereas men applied more frequently to clinics for drug prescription ( $p < 0.001$ ). Men had a greater incidence of HL, CAD, and peripheral arterial disease ( $p < 0.001$ ,  $p < 0.001$ , and  $p = 0.007$ , respectively); higher levels of glucose and creatinine ( $p = 0.001$  and  $< 0.001$ , respectively); and lower TC, LDL-C, and HDL-C concentrations ( $p < 0.001$  for all) (Table 1).

**Table 1. Comparison of clinical and biochemical features between women and men.**

	Women (n=321)	Men (n=259)	p-value
Age (years)	55.40±15.55 57 (44.5-67)	57.20±15.07 59 (48.75-67)	0.082
BMI (kg/m <sup>2</sup> )	27.90±4.96	27.42±5.17	0.232
BMI classification (n, %)			0.224
Underweight	4 (1.2)	6 (2.3)	
Normal	84 (26.2)	83 (32)	
Overweight	144 (44.9)	98 (37.8)	
Obese	89 (27.7)	72 (27.8)	
Complaints (n, %)			<0.001
Palpitation	52 (16.2)	11 (4.2)	
Chest pain	89 (27.7)	68 (26.3)	
Drug prescription	42 (13.1)	59 (22.8)	
Follow-up	56 (17.4)	58 (22.4)	
Dyspnea	21 (6.5)	14 (5.4)	
High blood pressure	29 (9)	17 (6.6)	
No complaint	2 (0.6)	2 (0.8)	
Referred from other clinics	19 (5.9)	20 (7.7)	
Other	11 (1.9)	10 (3.9)	
Diabetes mellitus (n, %)	74 (23.05)	70 (27)	0.334
Hypertension (n, %)	170 (52.9)	149 (57.5)	0.159
Hyperlipidemia (n, %)	82 (25.5)	121 (46.7)	<0.001
Smoking (n, %)	71 (22.2)	81 (31.5)	0.045
Coronary artery disease (n, %)	37 (11.7)	104 (40.4)	<0.001
Rhythm (n, %)			0.064
Sinusal	273 (85)	205 (79.2)	
Atrial fibrillation	48 (15)	54 (20.8)	
Perhiperal arterial disease (n, %)	4 (1.2)	13 (5)	0.007
Heart failure (n, %)	15 (4.7)	18 (6.9)	0.241
TSH (μIU/mL)	2.67±3.73 2 (1.1-3.1)	2.77±6.85 1.8 (1.2-2.56)	0.402
Glucose (mg/dL)	107.38±38.14 100 (91-109)	121.19±46.34 105 (94-134)	0.001
Creatinine (mg/dL)	0.75±0.44 0.70 (0.60-0.80)	0.94±0.28 0.90 (0.80-1.00)	<0.001
Total cholesterol (mg/dL)	203.81±44.13 201 (173.75-235)	179.28±50.08 173 (140-214)	<0.001
Triglyceride (mg/dL)	143.03±91.81 134 (92-174.50)	154.69±99.14 131 (94-180)	0.842
LDL-C (mg/dL)	121.01±37.60 119 (93-146)	104.55±40.47 96.5 (71-131.75)	<0.001
HDL-C (mg/dL)	55.27±13.22 54 (45-63)	46.65±10.65 43 (37-50)	<0.001

BMI: Body mass index, TSH: Thyroid stimulating hormone, LDL-C: Low-density lipoprotein cholesterol, HDL-C: High-density lipoprotein cholesterol

## DISCUSSION

Our study revealed that almost 17% of the patients visited the cardiology outpatient clinic for drug prescriptions. It also showed that only 6.7% of the patients were referred from other clinics, which means that most patients applied directly to the outpatient clinic.

Primary care, with its contributions to the health of the population, should be considered an integral part of the health system. It is linked to better functioning of the overall health system. By providing preventive care, primary care can reduce the burden of preventable disease and death.<sup>[3]</sup> A well-functioning primary care system is associated with lower mortality rates.<sup>[4]</sup> Shi et al.<sup>[5]</sup> showed that the presence of primary care physicians in the healthcare system is associated with lower mortality rates, whereas an increase in the number of specialists is associated with an increase in population mortality. In their study, a subgroup analysis also showed that only the presence of family physicians was associated with lower mortality rates than the presence of general internists and pediatricians. A study conducted in England showed that all-cause mortality among people aged 15-64 years was lower in places with a greater number of general practitioners.<sup>[6]</sup> In Spain, the introduction of primary care services has been associated with a reduction in mortality from HT and stroke.<sup>[7]</sup> In addition to better health services and outcomes, the presence of a family medicine system has been associated with a linear decline in total health care system costs.<sup>[8,9]</sup> All of these data underscore the importance of the family medicine system.

Although Turkey has recognized the importance of the primary care system and implemented a health transformation program, the structure and delivery process of this system in Turkey have been found to be weaker than those in European countries.<sup>[10,11]</sup> The main weaknesses of the Turkish system were a lack of quantitative and qualitative human resources, many patients, and a low number of primary care visits.<sup>[12,13]</sup> The system does not require patients to apply for primary care services. As a result, patients can apply to any hospital without consulting a family physician, leading to an inefficient primary care system.<sup>[1,2,12,13]</sup> The percentage of patients who applied for primary care services was 35%, indicating the dominance of hospital care.<sup>[13]</sup> The increasing number of government and private hospitals is another factor contributing to the high number of patients admitted to hospital outpatient clinics.<sup>[14]</sup> A study by Paul et al.<sup>[15]</sup> demonstrated that more than half of the patients visited a cardiologist for non-cardiac problems. Ada and Ünal<sup>[16]</sup> investigated the relationship between primary healthcare services and emergency department visits in Turkey. They found that the number of emergency department visits did not correlate with the number of people per family

physician and suggested strengthening the role of primary health care services to reduce the number of inappropriate emergency department visits. Öcek et al.<sup>[17]</sup> expolarized whether primary care service could achieve the cardinal functions and found that the family medicine model in Turkey was not able to integrate with community health services, specialist services, or social services. Our results were consistent with previous reports indicating that a significant percentage of patients who presented to hospital outpatient clinics could have actually received diagnostic and treatment services at primary care centers. We showed that 17.4% of the patients presented to the cardiology outpatient clinic for medication prescriptions and that only 6.7% of the patients were referred from other clinics for cardiological examinations. A total of 19.4% of patients visited the outpatient clinic for follow-up. According to our results, almost two-thirds of the patients could have solved their problems in primary or secondary health centers. Direct referral of these patients to tertiary centers causes unnecessary congestion and reduces the quality of care provided by physicians. The World Health Organization recommended that Turkey improve the coordination between general practitioners and specialists working in secondary services, strengthen the gatekeeping role of primary health centers, and introduce incentives for the better performance of primary services.<sup>[18]</sup>

In our study, 55.3% of the patients presenting to the cardiology outpatient clinic were female. Although the number of women was higher than that of men, the number of men diagnosed with CAD was higher. Biological differences between women and men are referred to as sex differences and result in differences in the presentation of cardiovascular disease.<sup>[19]</sup> For decades, cardiovascular disease research has focused primarily on men, leading to the underestimation of sex differences in cardiovascular disease. Studies have shown that women have a lower burden of obstructive CAD and a worse prognosis than men.<sup>[20]</sup> Women present with atypical symptoms, including weakness, fatigue, dyspnea, and palpitations, and recognition of both acute and chronic ischemic heart disease is often different or delayed in women.<sup>[21]</sup> Our findings may represent the underdiagnosis of women with CAD. We also evaluated the complaints of women and men. Women were more likely to visit outpatient clinics with complaints of palpitations and dyspnea, whereas men were more likely to visit outpatient clinics for medication prescriptions and to manage their chronic heart disease.

### Study Limitations

Our study was a single-center study, and the sample size was relatively small. We did not follow up with the patients for long-term outcomes.

## CONCLUSION

The majority of the patients could have had their problems solved through primary or secondary healthcare services. The direct application of patients to tertiary centers leads to congestion in outpatient clinics, which reduces the quality of patient care. Screening at the general practitioner level and an appropriate referral system can reduce the extreme burden of patients on cardiologists in the outpatient cardiology clinic.

## Ethics

**Ethics Committee Approval:** The study was approved by the İstanbul Bakırköy Dr. Sadi Konuk Training and Research Hospital Clinical Research Ethics Committee (decision no: 2023-07-04, date: 03.04.2023) and conducted according to the Declaration of Helsinki.

**Informed Consent:** Informed consent was obtained from the participants.

## Authorship Contributions

Concept: C.Y., S.Ö.Y., F.N.T.Ç., Design: C.Y., S.E., S.Ö.Y., M.G.G., E.Y., Data Collection or Processing: C.Y., S.E., S.Ö.Y., M.G.G., E.Y., F.N.T.Ç., Analysis or Interpretation: C.Y., S.E., S.Ö.Y., M.G.G., E.Y., F.N.T.Ç., Literature Search: C.Y., M.G.G., F.N.T.Ç., Writing: C.Y.

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

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