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Assessment of Family Physicians' Knowledge and Attitudes Toward Atrial Fibrillation and Oral Anticoagulants in Türkiye: What Do the Survey Results Reveal?

Türkiye'deki Aile Hekimlerinin Atriyal Fibrilasyon ve Oral Antikoagülanlar Hakkındaki Bilgi ve Tutumlarının Değerlendirilmesi; Anket Sonuçları Ne Söylüyor?

ABSTRACT

Objective: Atrial fibrillation (AF) is a common arrhythmia associated with a five-fold increased risk of stroke. Family physicians (FPs) serve as the primary contact point for patients seeking healthcare. While many surveys have assessed FPs' knowledge on AF across various countries, no such study has been conducted in Türkiye. This study aimed to evaluate the level of knowledge and approach to AF of FPs in Türkiye.

Methods: An online survey consisting of 38 multiple-choice questions was administered to 326 consenting physicians. The survey addressed demographic characteristics, AF diagnosis, risk factors, treatment approaches, counseling, consultation options, and levels of anxiety related to AF. Descriptive characteristics of the responses were analyzed.

Results: A total of 235 (72.1%) FPs demonstrated moderate or lower level of knowledge. A significant weak negative correlation was found between age and total knowledge score (rho = 0.123, P < 0.026), and a significant difference was identified between working status and knowledge score (P < 0.001). Only 7.1% of FPs reported having access to cardiologists when they needed consultation. Additionally, 81.9% tended to refer patients to a cardiologist for periprocedural management, and 85.9% for cases of minor bleeding. Of the respondents, 86.5% expressed that training on AF and oral anticoagulants (OACs) is absolutely necessary.

Conclusion: Major gaps in FPs' knowledge and skills regarding AF and anticoagulants were identified. Knowledge levels among FPs can be improved through training sessions, web-based applications, and conferences. FPs can be encouraged and supported to play an active role in AF management, which may enhance patient outcomes, reduce costs for the healthcare system, and share the workload of cardiologists.

Keywords: Atrial fibrillation, family physicians, knowledge, education, stroke

ÖZET

Amaç: Atriyal Fibrilasyon (AF) yaygın bir kardiyak aritmi olup, inme riskinde 5 kat artış ile ilişkilidir. Aile hekimleri hastaların sağlık hizmetleriyle ilk temas noktasıdır. Birçok ülkede aile hekimlerini bu konuda değerlendirmek amacıyla anket çalışmaları yapılmış olmasına rağmen ülkemizde böyle bir çalışma yapılmamıştır. Bu nedenle bizde anketimizde ülkemizdeki aile hekimlerinin AF açısından bilgi ve yaklaşımlarını ortaya koymayı amaçladık.

Yöntem: Onam veren 326 hekime hepsi çoktan seçmeli olmak üzere toplam 38 sorudan oluşan çevrimiçi bir anket uygulandı. Ankette demografik özellikler, AF tanısı, risk faktörleri ve tedavi yaklaşımı, hasta bilgilendirme, konsultasyon ve AF ile ilgili kaygı düzeyleri sorgulandı. Katılımcılardan alınan cevapların tanımlayıcı ozellikleri analiz edildi.

Bulgular: Aile Hekimlerinin 235'i (%72,1) orta ve daha düşük bilgi düzeyine sahipti. Yaş ile toplam bilgi puanı arasında negatif yönde anlamlı zayıf ilişki varken (rho=0,123, P < 0,026), çalışma durumu ve bilgi puanı arasında anlamlı fark saptandı (P < 0,001). İkili karşılaştırma sonrası anlamlı farkı oluşturan hekimler Aile Hekimi uzmanlarıydı. Aile hekimlerinin yalnızca %7,1'i konsültasyona ihtiyaç duyduklarında kardiyologlarla iletişim kurabildiklerini belirtti. Ek olarak, %81,9'unun periprosedürel yönetim ve %85,9'unun minör kanama için hastaları bir

ORIGINAL ARTICLE
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kardiyoloğa sevk etme eğiliminde olduğu tespit edildi. Yanıtlayanların %86,5 i AF ve oral antikoagulanlar konusunda eğitimlerin kesinlikle gerekli olduğunu belirtti.

Sonuç: Aile hekimlerinin AF ve antikoagulanlar hakkındaki bilgi ve becerilerinde önemli boşluklar tespit edilmiştir. Eğitimler, web sitesi tabanlı uygulamalar ve toplantılar ile aile hekimlerinin bilgi ve becerileri artırılabilir, Aile hekimleri teşvik edilebilir ve AF li hasta yönetiminde daha aktif hale getirilebilir. Bu sayede hasta sonuçları iyileştirilebilir, sağlık sistemi üzerindeki maliyet azaltılabilir ve kardiyologların iş yükü paylaşımı sağlanabilir.

Anahtar Kelimeler: Atriyal fibrilasyon, aile hekimleri, bilgi düzeyi, eğitim, inme

Atrial fibrillation (AF) is the most common clinically important cardiac arrhythmia, affecting an estimated 59.7 million people globally.[1] The incidence and prevalence of AF increase with age, reaching nearly 10% among individuals over 80 years old.[2] According to a recent report, the prevalence of AF among individuals over 75 years old in Türkiye is as high as 29%.[3] AF is a growing health issue, leading to recurrent hospitalizations, strokes, heart failure, and even death. This condition not only causes individual health problems but also places a significant burden on the healthcare system.[4]

The cornerstone of AF treatment to prevent systemic embolism and stroke is oral anticoagulant therapy, which includes vitamin K antagonists (VKAs) and direct oral anticoagulants (DOACs).[1] Four major randomized controlled trials have demonstrated the non-inferiority and/or superiority of DOACs (apixaban, edoxaban, rivaroxaban, and dabigatran) over warfarin in preventing stroke and systemic embolism.[5-8] Current AF guidelines recommend DOACs over VKAs, except for patients with mechanical heart valves or moderate-to-severe mitral stenosis.[1]

Family physicians (FPs) play an important role in primary healthcare, particularly in preventive medicine. In this context, the level of knowledge FPs possess regarding AF diagnosis and management in individuals over 65 years old is important. Early diagnosis of AF by FPs can significantly contribute to reducing morbidity and mortality by preventing stroke. Survey studies evaluating the knowledge and approaches of FPs regarding AF and its treatment have been conducted in many countries, but no such study has yet been conducted in Türkiye.[9-13] A survey conducted in Canada last year examined how FPs make decisions and feel about prescribing oral anticoagulants to patients over 75 years old with AF. The results showed that while FPs conducted effective risk assessments of patients and generally felt confident about initiating oral anticoagulants (OACs) for stroke prevention in patients with AF, many factors influenced this process.[9] In a 2021 telephone survey study conducted with 50 FPs in Canada, it was found that although the physicians had a good level of knowledge about AF and most initiated AF treatment themselves, there were knowledge gaps in certain areas, suggesting that training could be beneficial for improving patient outcomes.[11] Another internet-based survey conducted in Poland examined the educational needs of FPs in managing AF patients and found that, although knowledge gaps were minor, better communication with other specialties involved in AF care was clearly needed.[10]

To our knowledge, this is the first study to evaluate the knowledge and attitudes of FPs in Türkiye regarding AF with a large number of participants. The knowledge and approaches of FPs toward early diagnosis and specific aspects of patient follow-up are critical in managing these patients. Therefore, through this survey, we hypothesize that evaluating the knowledge levels and approaches of FPs will allow us to identify knowledge deficiencies and organize targeted training to reduce complications, especially stroke, associated with AF. This initiative can contribute to reducing morbidity and mortality for individual patients and lowering healthcare costs nationally. Education can encourage FPs to enhance their knowledge, making them more active in the diagnosis, follow-up, and management of AF patients. Improved knowledge among FPs on this subject will also help reduce the workload on cardiologists. Thus, with our study, we aim to draw the attention of national associations and working groups, such as the Turkish Society of Cardiology (TSC), that provide educational support to this issue.

ABBREVIATIONS

AF	Atrial fibrillation
FPs	Family physicians
OACs	Oral anticoagulants
VKAs	Vitamin K antagonists
DOACs	Direct oral anticoagulants
TSC	Turkish Society of Cardiology
INR	International Normalized Ratio
ECG	Electrocardiography
ESC	European Society of Cardiology
CHA2DS2-VASc	Congestive Heart Failure, Hypertension, Age, Diabetes Mellitus, Stroke, Vascular Disease, and Sex Category

Materials and Methods

This research is descriptive and cross-sectional. The survey was administered to a random sample of physicians selected from 25,000 family physicians in Türkiye who responded to an invitation email between November 1, 2023 and January 31, 2024. Power analysis was conducted to determine the study sample size. According to the power analysis, calculations were based on a chi-square analysis of the relationship between knowledge levels and understanding of the International Normalized Ratio (INR) range, as observed in the reference study (14). Given $\alpha = 0.05$, power $(1-\beta) = 0.95$, and an effect size of 0.368 (as determined based on the chi-square analysis in the referenced study), a minimum of 96 participants was required.

Physicians were informed about the study, and informed consent was obtained from all participants before beginning the online survey. A total of consenting 326 physicians were included in the study.

The researchers developed a standardized questionnaire by reviewing the literature. Our questionnaire consists of 38 multiple-choice questions. The first six questions address the demographic characteristics of the physicians. The next six focus on patients over 65 years old who are under the physician's care. An additional 10 questions assess knowledge of AF diagnosis, risk factors, and anticoagulation. Another 10 questions evaluate the diagnostic and treatment approach for AF patients, and the final six questions examine patient education, consultation practices, and levels of physician anxiety regarding AF. After being reviewed by the research team, the questions were evaluated by cardiology specialists with expertise in AF from different hospitals and refined based on their feedback. A pilot study was conducted with 15 FPs, and the questions were finalized following their input. Based on pilot findings, the questions were revised, and scoring criteria were established. The finalized questions were converted to email format and distributed via the Internet to FPs registered in various health units. The responses from participants on AF diagnosis, risk factors, and anticoagulant knowledge were analyzed. No specific cut-off score was predetermined for the survey answers; scoring was based on responses to the knowledge questions. The knowledge level score was calculated by assigning a value of 10 to each correct answer and 0 to each incorrect answer on the AF knowledge questions.

The study was approved by Kahramanmaraş Sütçü İmam University Medical Research Ethics Committee (Session Number: 2023/18, Approval Number: 04, Date: 24.10.2023), and conducted in accordance with the Declaration of Helsinki. Artificial intelligence (AI)-assisted technologies, including Large Language Models (LLMs), chatbots, and image generation tools, were not used in the production of any stage of this study.

Statistical Analysis

The research data were analyzed using the Statistical Package for the Social Sciences (SPSS) software (IBM Corp. Released 2015, IBM SPSS Statistics for Windows, Version 23.0, Armonk, NY: IBM Corp.). The conformity of the data to a normal distribution was assessed using visual methods (histograms and probability graphs) and analytical methods (Kolmogorov-Smirnov and Shapiro-Wilk tests). Descriptive statistics were presented as follows: for continuous numerical variables with a normal distribution, mean ± standard deviation (SD) was provided; for data not showing a normal distribution, median and minimum-maximum values were reported. Categorical variables were presented as numbers (n) and percentages (%). The Chi-Square Test or Fisher's Exact Test was applied for comparisons of categorical variables. When a significant difference was detected in comparisons involving variables with more than two categories (i.e., comparisons beyond 2 x 2), the groups were compared in pairs to identify the source of the difference, with Bonferroni correction applied to pinpoint the specific groups where the difference was found. For continuous variables not conforming to a normal distribution, the Mann-Whitney U test was used for comparisons between two independent groups, and the Kruskal-Wallis test was applied for comparisons among three or more independent groups. In post hoc analyses, the Mann-Whitney U test with Bonferroni correction was performed following the Kruskall-Wallis test. The relationship between variables was evaluated using the Spearman correlation test. A P value of <0.05 was considered the threshold for statistical significance.

Results

The mean age of the 326 participants was 39.61 ± 9.17 years (min-max: 25-62, median: 37), and the mean duration of practice was 14.01 ± 9.34 years (min-max: 1-40, median: 12). The sociodemographic characteristics of the participants are shown in Table 1.

Table 1. Sociodemographic Characteristics of the Participants

Parameter	Groups	Mean ± SD	Min-Max (Median)
Age, years		39.64 ± 9.21	25-62 (37.5)
Years in Practice		14.05 ± 9.38	1-40 (12)
Number of Patients Seen Daily		59.27 ± 24.14	6-140 (60)
Parameter	**Groups**	**n**	**%**
Gender	Male	131	40.2
	Female	195	59.8
Practice Location	Province Center	235	72.1
	County	80	24.5
	Village/Town	11	3.4
Working Status	Family Physician (General Practitioner)	138	42.3
	Family Medicine Research Assistant	46	14.1
	Family Medicine Specialist	79	24.2
	Contractual Family Medicine Specialist	63	19.3

SD, Standard Deviation; n, Frequency; %, Column Percentage; Min, Minimum; Max, Maximum.

Table 2. Patient Characteristics in Family Physicians' Outpatient Clinic Services

Parameter	Groups	n	%
Percentage of Patients Over 65 Years	<5%	51	15.6
	5-10%	114	35.0
	10-20%	105	32.2
	>20%	56	17.2
Percentage of Patients with Stroke	<1%	177	54.3
	1-5%	118	36.2
	5-10%	24	7.4
	>10%	7	2.1
Number of AF Patients Examined in the Previous Month (Both New and Existing Diagnoses)	Never Seen	128	39.3
	1-5	166	50.9
	6-10	21	6.4
	>10	11	3.4

n, Frequency; %, Column Percentage; AF: Atrial Fibrillation.

Table 2 presents the characteristics of patients receiving outpatient clinic services from FPs. The number of physicians with 5-10% of their patients over the age of 65 was 114 (35%), and the number of physicians with 1-5% of their patients having a history of stroke was 118 (36.2%). More than half of the physicians reported having examined patients with AF in the previous month.

A total of 88% of FPs stated that they had previously diagnosed new cases of AF; almost all of them agreed that AF screening would be effective for early diagnosis (Figure 1).

Nearly all FPs were familiar with the risk factors, symptoms, and physical examination findings associated with AF. However, only about half of them correctly identified the bleeding and stroke risk scores for AF. The question regarding the AF bleeding risk score was the least correctly answered (42.3%), while the question on AF symptoms had the highest correct response rate (94.8%). Additionally, 65.6% of FPs correctly identified that DOACs should not be used in cases of moderate-to-severe mitral stenosis or with mechanical heart valves. The overall knowledge level of FPs was 74.96 ± 15.95 (min-max: 30-100, median: 80). There was a significant but weak negative correlation between age and total knowledge score (rho = 0.123, P < 0.026). No significant correlation was found between the number of patients examined daily, years of practice, and total knowledge score (P < 0.05). Although no statistically significant difference was observed between gender, place of work, and total knowledge score (P < 0.05), a significant difference was found with respect to working status (P < 0.001). In terms of working status, it was observed that the significant difference after pairwise comparison was associated with Family Medicine Specialists. The responses to the knowledge questions according to working status are presented in Table 3. Table 4 shows the AF knowledge scores of physicians, revealing that 235 (72.1%) of FPs had a moderate or lower level of knowledge. Figure 2 illustrates the factors contributing to FPs' concerns when following up on AF patients receiving OACs.

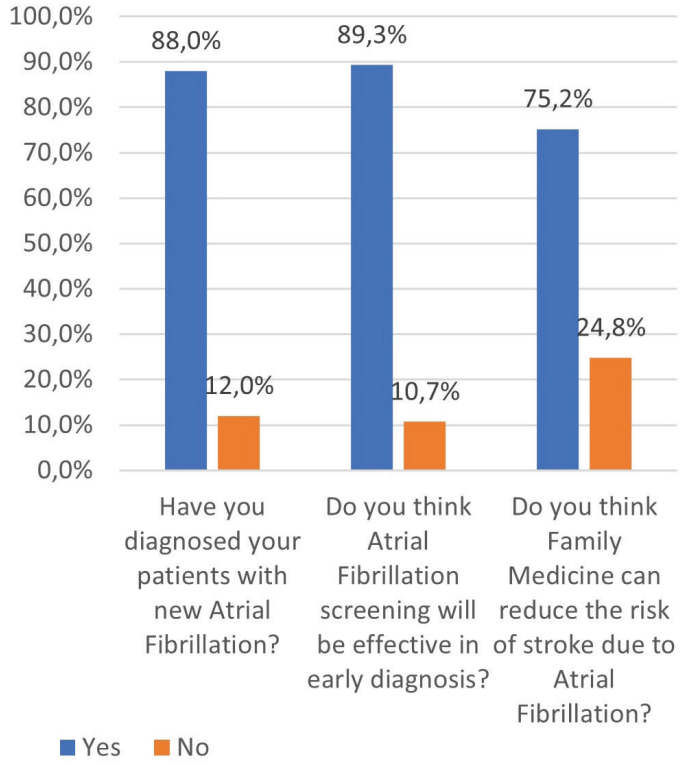

Figure 1. Opinions of family physicians on atrial fibrillation (AF) screening.

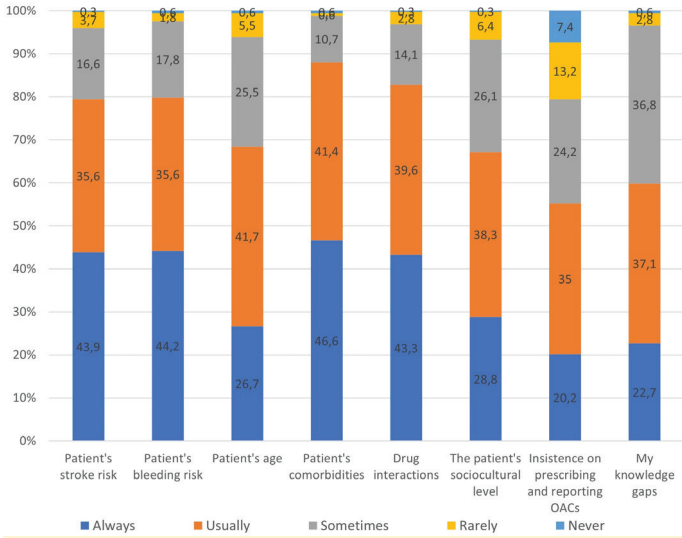

Figure 2. Factors that cause concern for family physicians when managing AF patients on oral anticoagulants (OACs).

Approximately half of the FPs reported using electrocardiography (ECG) when they suspected AF in patients over 65, while 67.8% indicated that they routinely inquired about patients' use of antiaggregants and anticoagulants. Nearly all FPs stated that when they diagnosed AF, they did not initiate treatment themselves but referred the patient to a cardiologist. Additionally, 56.1% expressed that they did not wish to have the authority to prescribe DOACs. Periprocedural management

Table 3. Knowledge of Atrial Fibrillation Among Family Physicians Based on Their Working Status

Questions/Answers	Working Status								p*
	Family Physician (General Practitioner)		Family Medicine Research Assistant		Contracted Family Medicine Specialist		Family Medicine Specialist		
	n	%	n	%	n	%	n	%	
Which of the following is not a risk factor for atrial fibrillation (AF)?									
Correct	123	40.2	44	14.3	62	20.3	77	25.2	**0.022**
Incorrect	6	27.3	6	27.3	5	22.7	5	22.7	
Which of the following is not a symptom of AF?									
Correct	122	39.5	51	16.5	61	19.7	75	24.3	0.852
Incorrect	6	35.4	5	29.4	1	5.8	5	29.4	
What is the most common physical examination finding in AF?									
Correct	119	38.8	56	18.2	58	18.9	74	24.1	0.903
Incorrect	7	33.4	4	19.0	5	23.8	5	23.8	
What is the diagnostic method for AF?									
Correct	115	41.2	34	12.2	55	19.7	75	26.9	**0.01**
Incorrect	23	48.9	12	25.5	8	17.0	4	8.5	
Which ECG finding is indicative of AF?									
Correct	90	38.3	36	15.3	42	17.9	67	28.5	**0.01**
Incorrect	48	52.7	10	11.0	21	23.1	12	13.2	
Which of the following is not included in stroke risk scoring for AF?									
Correct	86	42.3	30	14.7	36	17.8	51	25.2	0.783
Incorrect	52	42.2	16	13.1	27	21.9	28	22.8	
Which of the following is not included in bleeding risk scoring for AF?									
Correct	58	42.1	17	12.3	25	18.1	38	27.5	0.711
Incorrect	80	42.5	29	15.4	38	20.2	41	21.9	
Which method is used for stroke prevention in AF?									
Correct	67	34.7	30	15.5	32	16.6	64	33.2	**<0.001**
Incorrect	71	53.4	16	12.0	31	23.3	15	11.3	
Which of the following is not a DOAC?									
Correct	108	41.2	32	12.2	51	19.5	71	27.1	**0.04**
Incorrect	30	46.9	14	21.9	12	18.8	8	12.5	
DOACs cannot be used in which of the following AF scenarios?									
Correct	89	41.6	31	14.5	39	18.2	55	25.7	0.78
Incorrect	49	43.8	15	13.4	24	21.4	24	21.4	
Knowledge Questions Mean ± SD	72.17 ± 17.37		74.13 ± 15.28		73.17 ± 13.29		81.77 ± 13.84		**<0.001**

AF, Atrial Fibrillation; DOAC, Direct Oral Anticoagulant; SD, Standard Deviation; *Pearson Chi-Squared Test. Statistically significant results are in bold.

Table 4. Participants' Knowledge Score Levels

	n	%
0-20 Points: Very Poor Knowledge	16	4.9
21-40 Points: Poor Knowledge	62	19.0
41-60 Points: Medium Knowledge	157	48.2
61-80 Points: Good Knowledge	91	27.9
81-100 Points: Very Good Knowledge	16	4.9
Total	326	100.0

n, Frequency; %, Column Percentage.

and approaches to bleeding conditions in patients receiving OAC for AF are shown in Table 5. The most common topics on which FPs educated patients were smoking cessation and the importance of medication adherence (90.8% and 90.3%, respectively), while taking rivaroxaban with food was the least commonly discussed topic (25.1%). Patient education rates on other topics are provided in Table 6. Only 7.1% of FPs reported having the ability to contact a cardiologist when they needed consultation.

FPs' opinions on their level of knowledge and the need for training are presented in Figure 3.

Table 5. Family Physicians' Answers to Questions Related to AF and Approach to Anticoagulant Use

Question	Response Options	n	%
In patients over 65 years of age, how often do you use an ECG device when AF is suspected?	Always/Usually.	167	51.2
	Sometimes/Rarely.	71	21.8
	I do not use it; I refer to a cardiologist.	88	27.0
How often do you check for the use of antiaggregants or anticoagulants in patients over 65 years?	Always/Usually.	221	67.8
	Sometimes/Rarely.	81	24.8
	I do not check; I refer to a cardiologist.	24	7.4
When you diagnose AF, how often do you initiate treatment yourself?	Always/Usually.	14	4.3
	Sometimes/Rarely.	38	11.7
	I do not initiate treatment; I refer to a cardiologist.	274	84.0
Your patient receiving oral anticoagulation for AF mentions minor bleeding; what would be your recommendation regarding anticoagulation?	I advise stopping the medication immediately.	21	6.4
	I advise not stopping the medication and refer to a specialist for necessary examinations.	280	85.9
	I advise that they do not need to stop the medication and should continue as prescribed.	25	7.7
What would be your approach if your patient is on anticoagulant for AF and ASA for concomitant stable CAD?	I recommend continuing ASA.	50	15.3
	I recommend continuing ASA and reducing the dose of the anticoagulant.	21	6.4
	I stop ASA.	23	7.1
	I do not interfere with the medication; I refer to a cardiologist.	232	71.2
How do you manage the process when your patient taking oral anticoagulants for AF needs to discontinue the medication due to an invasive procedure (e.g., dental procedures, biopsy, surgical operation, etc.)?	I always manage this myself.	11	3.4
	I sometimes manage this myself.	48	14.7
	I do not adjust the medication; I refer to a cardiologist.	267	81.9
Would you like to be authorized to prescribe and manage DOACs?	Yes.	41	12.6
	Sometimes.	102	31.3
	No, absolutely not.	183	56.1

n, Frequency; %, Column Percentage; AF, Atrial Fibrillation; ASA, Acetylsalicylic Acid; CAD, Coronary Artery Disease; DOAC, Direct Oral Anticoagulant.

Table 6. Family Physicians' Responses to Patient Information and Consultation Approach Questions on Atrial Fibrillation

Question	Response	n	%
What counseling do you provide for your patients with AF?*	Complaints and symptoms	233	71.4
	Smoking cessation	296	90.8
	Increasing physical activity and regular exercise	215	65.9
	Dietary considerations	246	75.4
	Importance of medication adherence	301	92.3
	Conditions requiring referral to a cardiologist	292	89.6
	Taking rivaroxaban with food	82	25.1
	Avoiding NSAIDs	214	65.6
	Avoiding excessive alcohol consumption	227	69.6
	Fall protection	210	64.4
	Blood pressure control	279	85.5
Are you able to communicate verbally with the cardiologist when you need a consultation for patients with AF?	Yes	23	7.1
	Sometimes	51	15.6
	Never	133	40.8
	I refer directly to the cardiologist	119	36.5

*More than one option could be selected. n, Frequency; %, Column Percentage; AF, Atrial Fibrillation; NSAIDs, Non-Steroidal Anti-Inflammatory Drugs.

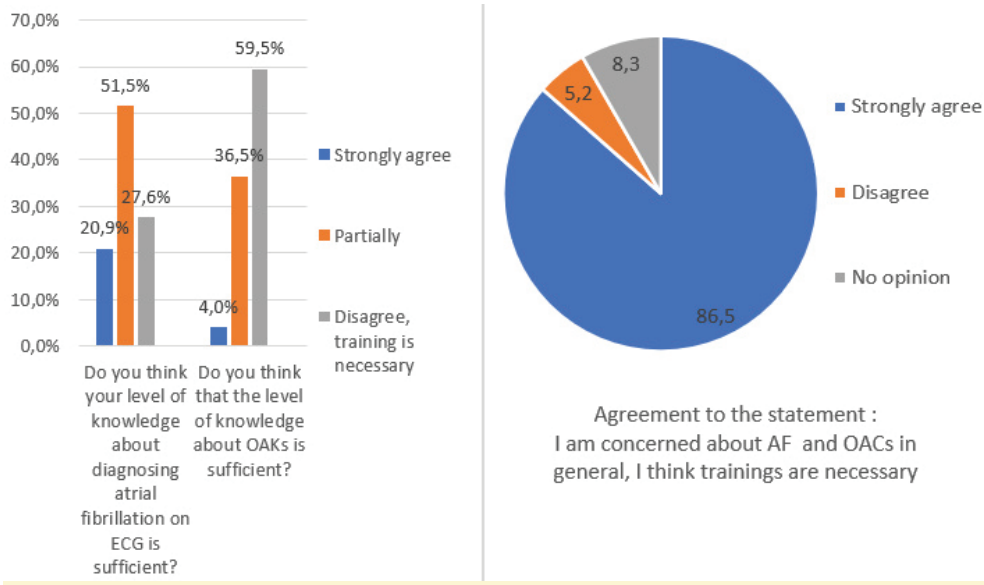

Figure 3. Family physicians' perspectives on the need for education regarding AF.

Discussion

This is the first study in Türkiye involving FPs to assess significant gaps in physicians' knowledge and skills in managing patients with AF through a questionnaire. To reflect current realities accurately, the study included physicians with different AF caseloads and differing years of practice experience. In addition to deficiencies at the individual physician level, the study highlights systemic issues, such as communication barriers, anxiety, and national regulations that may impede the optimal management of AF care.

The results revealed that: 1) The majority of FPs were able to diagnose new cases of AF and believed that screening could support early diagnosis and reduce stroke risk associated with AF. 2) FPs demonstrated poor knowledge regarding stroke and hemorrhage risk scoring and valvular AF. 3) The majority of FPs reported difficulties in consulting with specialists when needed, and in most cases, they referred patients to cardiologists. 4) Except for the recommendation to take rivaroxaban with food, avoid nonsteroidal anti-ınflammatory drugs (NSAIDs), and limit excessive alcohol use, physicians were found to be generally adequate in counseling. 5) Importantly, 86.5% of FPs stated that they felt a strong need for training regarding AF and OACs.

AF is the most common arrhythmia worldwide, affecting an estimated 59.7 million people, with the number of AF cases doubling every few decades.[1] The onset and progression of AF are associated with a number of comorbidities and risk factors, making early detection and active management of these conditions and risk factors essential. Failure to do so contributes to poor patient outcomes, treatment failures, and wasted health resources.[1] In an economic study of 2,054 elderly individuals and 22 Canadian FPs, the long-term costs of four AF screening models were evaluated. Screening with a pulse check was found to be the most cost-effective, offering low cost with equal or greater effectiveness compared to other models.[15] Current guidelines recommend routine heart rhythm assessments during healthcare visits for all individuals over 65 years of age to detect AF earlier. It is also advised to consider ECG-based population screening for early detection of AF in individuals aged 75 years or older, or 65 years and older with additional stroke risk factors.[1] In our study, nearly all FPs stated that they could make a new diagnosis of AF and believed that AF screening would be effective in early diagnosis and reducing stroke risk for patients. Although there is currently a cardiovascular screening protocol within family medicine practice in our healthcare system, it does not include a specific screening algorithm forAF. As seen in some countries, AF screening algorithms for FPs should be developed under cardiology leadership, guided by current guidelines, and implemented into routine practice.[16,17]

The 2024 European Society of Cardiology (ESC) Guidelines include primary care in every step of the recommended approach for optimal AF management[1] As a result, FPs' knowledge about AF is critical. In our study, the majority of FPs correctly answered questions about AF risk factors, symptoms, and physical examination findings. However, only about half could accurately respond to questions regarding AF-related stroke and hemorrhage risk scores. Although the CHA2DS2-VASc (Congestive Heart Failure, Hypertension, Age, Diabetes Mellitus, Stroke, Vascular Disease, and Sex Category) category has been globally accepted for many years to determine the need for anticoagulation in AF patients, many physicians still report insufficient knowledge about it.[18] The findings for the HAS-BLED score, which assesses hypertension, abnormal renal or liver function, stroke, bleeding history, labile international normalized ratio, elderly age, and drug or alcohol use, were even more concerning; over half of the FPs could not correctly answer questions about this score. This result aligns with other studies on knowledge gaps in AF management among European physicians, including a sub-study evaluating Polish physicians.[10,18] In these studies, FPs indicated challenges in applying the CHA2DS2-VASc and HAS-BLED

scores in clinical practice. Our study supports these findings in the literature, with a higher participant count. Notably, a few months after our survey, the 2024 ESC Guidelines for AF management were published, introducing updates to these scoring systems. Gender was removed from the CHA2DS2-VASc score, resulting in the CHA2DS2-VA score, and a focus on assessing and managing modifiable bleeding risk factors for all patients is now recommended to prevent bleeding, rather than relying solely on the HAS-BLED score for decision-making.[1] On the other hand, 65.6% of our FPs correctly recognized that DOACs should not be used in valvular AF. This rate is considerably better than the findings of Carlin et al.,[11] where 48% of participants incorrectly indicated that DOACs could be used in cases of moderate to severe mitral stenosis, and 12% stated they could be used in patients with mechanical heart valves —groups for whom DOACs are contraindicated.[1] It is encouraging that this knowledge is relatively more advanced among FPs in our country.

The relationship among multidisciplinary healthcare providers is a crucial aspect of optimal AF management.[1] In this context, collaboration between FPs and cardiologists is important. In our survey, only 7.1% of FPs reported being able to communicate verbally with cardiologists when needing consultation. As a result, we observed that FPs tend to refer AF patients to cardiologists in most cases—81.9% for periprocedural management and 85.9% for minor bleeding. Inadequate communication between FPs and specialists was also highlighted in other studies,[10,18] where Polish FPs reported general dissatisfaction, and 46% of European FPs noted suboptimal collaboration between specialists and FPs.[18] Professional associations and working groups could help eliminate these barriers at the national level and represent an active area for intervention. This could be achieved by creating a family physician-cardiologist consultation platform on associations' websites, which could be widely used by FPs.

One of the areas evaluated in our survey was the counseling provided by FPs to patients with AF. Based on their responses, we found that they offered highly appropriate counseling on smoking cessation, medication adherence, referrals to specialists, and blood pressure control. However, only 25.1% of FPs advised patients to take rivaroxaban with food. This finding is consistent with Carlin et al.,[11] but is still in need of improvement. Counseling was also limited in terms of advising patients to avoid NSAIDs and excessive alcohol use. Addressing these gaps in counseling will likely improve patient outcomes.

Lastly, knowledge and skill gaps in all areas of AF care have been identified among many specialists, general practitioners, and allied health professionals.[1] Consistent with this, only 20.9% of FPs in our study stated that their knowledge of AF was sufficient, and only 4% felt sufficiently informed about DOACs. Additionally, 86.5% of FPs strongly agreed with the statement, "I am generally concerned about atrial fibrillation and oral anticoagulants, and I think training is necessary." Targeted education initiatives could help bridge these gaps, empowering FPs to take a more active role in managing AF patients.

Limitations

This study is significant in that it scientifically examines the level of knowledge and attitudes of FPs in Türkiye regarding AF and OACs. While numerous surveys on different topics have been conducted in our country,[19-21] and FPs have been assessed in relation to other clinical conditions,[22] this particular issue has not previously been explored in a survey of FPs. The sample size is substantial by literature standards and provides ample generalizability. Nevertheless, our study has some limitations. The first is that, as a questionnaire-based study, the criteria were subject to subjective interpretation. Another limitation is that we only evaluated FPs; future studies could include other specialties such as neurology, emergency medicine, and geriatrics, as these providers are also involved in AF care. Lastly, because the 2024 ESC guidelines had not yet been published at the time of our survey, scoring questions were based on the latest available guidelines and were not updated as the survey had already been completed. Despite these limitations, our study effectively reflects the current awareness of FPs regarding AF and OACs.

Conclusion

In this survey study, we assessed the knowledge gaps and approaches of FPs in Türkiye regarding AF and OACs, identifying major deficiencies in physicians' knowledge and skills. The study also highlighted significant communication problems between FPs and cardiologists, which may warrant corrective actions. Our findings can guide the development of targeted training programs with a focus on areas where knowledge and skills are lacking. Such training could be delivered through web-based applications and conferences that offer feedback. In this way, patient outcomes in AF can be improved, healthcare system costs reduced, FPs empowered to take a more active role in diagnosis and follow-up, and collaborative team-based care between FPs and cardiologists facilitated, promoting effective workload sharing.

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