

IRAQI PRIMARY CARE PHYSICIAN'S KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) TOWARD ANTICOAGULANT THERAPY IN NONVALVULAR ATRIAL FIBRILLATION PATIENTS: A CROSS-SECTIONAL STUDY

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Abstract

Background: In Iraq, the majority of atrial fibrillation (AF) patients are managed by primary care physicians (PCPs). Therefore, this is a cross-sectional study that aimed to evaluate the PCPs' knowledge, attitudes, and practices (KAP) toward the use of oral anticoagulants (OAC) in patients with AF and to identify the barriers to OAC prescription. **Methods:** A self-administered online questionnaire was completed by 150 PCPs. KAP scores were categorized as poor, fair, and good. Stepwise binary logistic regressions were conducted to predict the variables significantly associated with KAP. **Results:** 63.3% of the PCPs had poor knowledge and none had a good knowledge score. On the other hand, 78% of the PCPs had good attitude score. Having more than 5 years of experience increased the odds of having high KAP. Similarly, attending a training about OAC in AF patients increased the odds of having better knowledge and practice. **Conclusions:** Iraqi PCPs had poor knowledge, but satisfactory attitudes toward the use of OAC in AF patients. The majority were willing to attend training about AF disease and anticoagulation therapy. Such trainings will significantly increase the PCPs' knowledge about OAC which would improve AF patient management.

Keywords: *Atrial Fibrillation, OAC, Knowledge, Attitude, Practice.*

Introduction

Atrial fibrillation (AF) is the most common type of sustained cardiac arrhythmia(1). Globally, AF was estimated to affect 33.5 million people in 2010 and the prevalence is increasing according to several studies(2–4). AF can be triggered by several causes and accordingly it is classified to valvular and non-valvular AF (NVAF). Valvular AF happens in patients with artificial heart valves(5) while NVAF refers to any form of AF that happens in the absence of heart valve diseases(6). Consequently, the treatment guidelines for these types vary, particularly in anticoagulation recommendations.

Oral anticoagulants (OAC) are the mainstay in stroke prevention for patients with AF and can prevent about two-thirds of AF-related strokes(7,8). Nevertheless, a significant underuse of OAC in AF patients was reported by the National Institute for Health and Clinical Excellence (NICE) with 42% of the candidates for anticoagulants not being prescribed OAC(9). A similar percentage was reported on the prevalence of the use of OAC in newly diagnosed high-risk AF patients in Asia(10). Several reasons may lead to this underuse, including the fear of bleeding, the cost and time spent in coagulation monitoring, or simply physicians' or patients' unawareness of the importance of the use anticoagulants(9,11).

As Health centers in Iraq treat most patients suffering from NVAF, primary care physicians (PCPs) play a decisive role in the prophylaxis of embolisms. Thus, PCPs in Iraq must be capable of managing patients with NVAF who are on oral anticoagulant (OAC) therapy. The current study aimed to evaluate the Iraqi PCPs' knowledge, attitudes, and practices (KAP) toward the use of OAC in NVAF, in addition to establishing the obstacles to starting anticoagulants and the barriers to patients' compliance with anticoagulant therapy.

Methods

Design and recruitment

This cross-sectional study was conducted in Iraq between March and June 2021. The contact information of PCPs working in 25 health centers

from different regions in Iraq were obtained from human resources departments. The survey and the participant information sheet were formulated on Google Forms, and the link was emailed to the supplied email addresses to all PCPs working in the 25 centers (245 in total), reminder emails were sent 2 weeks and 1 month after the initial email.

Instrument development

The questionnaire was adapted from Ye et al(12). The questionnaire included 52 questions divided into 5 sections. The first section collected the participants' demographics, the second section gathered information about the experience of the participants with AF and anticoagulation, and the remaining sections evaluated the participants' knowledge (Table 3) which included multiple answer questions, attitudes (see Table 1, Supplemental Digital Content 1, which represents the attitude score items), and practice (Table 2, Supplemental Digital Content 2, which represents the practice score items) toward the use of anticoagulants in NVAF patients.

Three scores were calculated. The first score was knowledge score as one point was given for correct answer and zero given for wrong or uncertain answers. The second score was attitude score and it was based on a five-point Likert scale that ranged from strongly disagree (one point) to strongly agree (five points) for items that evaluated favorable attitudes and reversed scoring for items that evaluated unfavorable attitudes. Lastly, practice score was computed with the score ranging from never (1 point) to always (4 points) for correct practice items and reversed scoring for incorrect practice items. Based on Ye et al(12), the KAP scores were categorized as poor ($\leq 39.0\%$), fair (40.0–69.0%), and good ($\geq 70.0\%$).

Instrument validity and reliability

The initial version of the questionnaire was evaluated by an expert panel composed of cardiac specialists to ensure content validity. Then, to assess face validity and cleanness, the questionnaire was completed by 10 PCPs and their data were not included in the final study. Cronbach's alpha for attitude and practice scores (Likert scale questions) were 0.77 and 0.83 respectively.

Data analysis

SPSS version 27 was used to analyze the data. Categorical variables were presented as frequencies and percentages (%) while continuous variables were presented as means and standard deviations (SD). Stepwise binary logistic regressions were conducted to predict the variables significantly associated with higher levels of KAP. The included independent variables were the length of working experience, Health center type, education level, number of AF patients that the physician treats per year, and whether the physician attended a training on the usage of anticoagulants for AF patients or not. The number of working years was classified into less than 5 years and 5 years or more. Similarly, the level of highest education was classified into bachelor's degree and postgrad degree. Furthermore, the number of AF patients that physician treats per year was classified into less than 50 patients and 50 patients or more. Spearman tests were conducted to evaluate the correlation between the KAP three levels (Knowledge, Attitude and Practice).

Results

One hundred and fifty PCPs completed the questionnaire with a response rate of 61.2%. As shown in Table 1, more than half of the PCPs were males (56.7%) and the majority was younger than 39 years. About two thirds (60.7%) of the PCPs had a bachelor's degree and about one third (35.8%) were residents.

As shown in Figure 1, the main perceived obstacle for starting anticoagulant treatment in AF patients was the risk of bleeding (48%), followed by the tests for coagulation monitoring (16%). Regarding the PCPs' opinions on the main barriers affecting AF patients' compliance, the main barrier was felt to be the fees of anticoagulation (cost of medications and monitoring) (43.3%), followed by the tests for coagulation monitoring (10.7%) and fear of bleeding (10.7%).

As Table 2 shows, none of the PCPs had good knowledge score and the preponderance (63%) had poor knowledge. Table 3 presents the frequencies of the PCPs' correct answers to the questions that

evaluated their knowledge about AF and anticoagulants. Almost all PCPs did not know all the tests that can be used to diagnose AF as only 3 (2%) PCPs chose the correct answer. Moreover, only 10 (6.7%) PCPs identified all risk factors included in HAS-BLED score and 16 (10.7%) PCPs knew the frequency of monitoring coagulation function in AF patients with long-term warfarin therapy at a stable period. On the other hand, the majority (76.7%) of the PCPs identified the correct warfarin antagonist, and half of them knew the target International normal ratio (INR) range in under 75 years old NVAF patients.

The majority (78%) of the PCPs in the current study expressed good attitudes towards anticoagulation therapy in patients with NVAF. As shown in Table 1, supplementary material, the most favorable attitudes were toward the following items: "It is safe to maintain the INR between 2.0 and 3.0 for warfarin anticoagulation therapy in NVAF patients." (4.38±1.14) and "I think doctors can improve the standard anticoagulant treatment rate in AF patients after attending training courses in atrial fibrillation and anticoagulation" (4.29±1.05). While the least attitudes were toward these items: "I am more concerned about the risk of bleeding in NVAF patients than the risk of stroke in NVAF patients" (3.19±1.29) and "The type of atrial fibrillation would affect doctor's decision to initiate anticoagulant therapy and oral anticoagulant choice" (3.21±1.29).

The PCPs' scores were distributed between the fair practice level (56.7%) and good practice level (43.3%). Table 2 (supplementary material) shows the questionnaire's items that assessed the PCPs' practice in regard to anticoagulants use in AF patients. The highest scoring item was "A 75-year-old female NVAF patient, with history of hypertension, congestive heart failure and had TIA 3 years ago. Ultrasound indicated aortic atherosclerosis and atrial enlargement. Would you give this patient oral anticoagulant therapy?" (3.31±0.93), while the lowest score was for "If high-risk for thrombus formation NVAF patient had gastrointestinal bleeding 3 months ago and has stopped bleeding for 1 week, would you give this patient oral anticoagulant therapy?" (2.12±0.95).

Table 4 present the results of binary logistic regressions of KAP levels. Working years was

significantly associated with KAP scores as having 5 or more years of experience increase the odds to have higher KAP scores (OR=12.54, 4.05, and 12.52 respectively). The attendance of a training on the usage of anticoagulants for AF patients was significantly associated with knowledge and practice levels as those who had attend a training had higher odds of having higher knowledge and practice levels (OR=4.52 and 5.41 respectively). Lastly, working in rural Health centers increased the odds of having a good practice level when compared to working in urban centers (OR=9.25, p-value <0.05).

Spearman test results indicate significant correlation between the KAP levels (p-values <0.001). Strong positive correlation was observed between knowledge and practice levels ($r=0.59$), moderate positive correlation was observed between knowledge and attitude ($r=0.40$), and weak positive correlation was observed between practice and attitude ($r=0.34$).

Discussion

PCPs play a major role in the treatment and prevention of several diseases and disease complications. AF is one of the diseases that commonly diagnosed and managed by PCPs(13). Therefore, it is essential to assess the PCPs' KAP toward AF and identify any weaknesses in order to address them successfully. The current study revealed that Iraqi PCPs have inadequate knowledge about the use of OAC for NVAf but they were aware of the importance of these agents.

The PCPs in the current study had very poor knowledge about many aspects of the use anticoagulation therapy in NVAf. This result is consistent with the result of Ye et al study(12) but opposes the results of a Saudi study where the majority of the participating family physicians had average awareness about anticoagulants(14). Only 3 PCPs in the current study knew all the tools that can be used to diagnose AF. This poor knowledge may lead to under-diagnosis of patients with AF, which is likely to increase the morbidity and mortality related to AF if the complications are not adequately prevented.

Stroke and bleeding assessment scores are useful validated tools that guide the clinical decision

makers in the management of stroke prevention in AF patients(15,16). Low awareness of these scores in general and the risk factors included in them was observed among the PCPs in this study and in other studies(12,17). This indicates that PCPs do not usually use these scores when managing a patient with AF, which may jeopardize the patient's health and increase risks of stroke and bleeding.

Another gap in the PCPs' knowledge was in the frequency of coagulation function and the factors that are susceptible to the anticoagulation effect of warfarin as only 30% of the PCPs were able to identify the three factors (genes, food, and drugs). Awareness of this information is essential to monitor patients successfully and to conduct an effective patient education.

When compared to warfarin, new oral anticoagulants (NOAC) have more than few advantages including better safety profile, more convenient use, and less food and drug interactions(18). These advantages made NOAC the preferred agents for patients with NVAf over warfarin(19). In the current study, over 80% of the PCPs were unable to recognize all NOAC. As PCPs manage different diseases, this may decrease their ability to be up-to-date with all new medications and guidelines' recommendations. Therefore, providing focused training on the treatment guidelines of AF may significantly enhance the quality of AF patients' treatment. The advantage of such training is supported by the results of this study as the PCPs who attended training on the usage of anticoagulants for AF patients had significantly higher knowledge and practice levels.

Despite their unsatisfactory knowledge, the PCPs in the current study expressed positive attitudes toward the use of OAC for NVAf patients. Particularly in areas where they had gaps in knowledge. This highlights the importance of organizing training that can improve PCP knowledge and practice.

In binary regression analysis, PCPs who were working in rural centers had a significantly higher practice score when compared to those working in urban centers. However, the number of the rural PCPs was limited compared to other centers which may cast doubt on the generalizability of this result.

Nevertheless, the better practice levels in rural PCPs may be linked to the fact that rural areas usually have fewer medical resources and fewer specialized hospitals and physicians which oblige the PCPs in these areas to treat AF patients themselves as they cannot refer them to specialized cardiologists.

Regarding the obstacles of starting anticoagulants in AF patients, fear of bleeding was the most mentioned obstacle. Several assessment tools can be used to predict the bleeding risk among AF patients including ABC-bleeding score, ATRIA, European score, GARFIELD-AF, HAS-BLED, HEMORR2HAGES, ORBIT, Shireman, and mOBRI scores(20). Among these scores, HAS-BLED was found to be a balanced, sensitive, and specific tool that can be used to predict major bleeding events in AF (20). Another frequently mentioned obstacle was the monitoring of coagulation function tests, this obstacle can be easily overcome in NVAF by the use of the NOAC which do not need monitoring(18).

Concerning the major barriers affecting AF patients' compliance to anticoagulants, fees related to the cost of coagulation was the most frequently mentioned barrier as NOAC are relatively expensive, with warfarin more inexpensive. However, NOAC are cost-effective agents(21-23) when evaluated against the costs of the consequences of not taking these medications. Therefore, health authorities and medical insurance companies should cover these agents' costs.

Limitations

The study limitations include social desirability bias and recall bias. In addition, only PCPs who were interested in the aim of the study completed the questionnaire which may limit the generalizability of the study's results.

In conclusion to our knowledge, this the first study to assess the Iraqi PCPs' KAP related to OAC use in NVAF. The current study identified several gaps in knowledge about the use of OAC which warrants immediate action to improve PCPs' knowledge and, in turn, improve the management of AF and decrease the prevalence of stroke and bleeding among these patients. Furthermore, our findings also indicate that PCPs have positive attitudes toward gaining more knowledge about the

management of AF patients. Therefore, training programs focused on AF patient management can be easily implemented and delivered to PCPs.

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Not applicable

References

1. Lippi G, Sanchis-Gomar F, Cervellin G. Global epidemiology of atrial fibrillation: An increasing epidemic and public health challenge. *Int J Stroke*. 2021;16(2):217–21.
2. Chugh SS, Havmoeller R, Narayanan K, Singh D, Rienstra M, Benjamin EJ, et al. Worldwide epidemiology of atrial fibrillation: a Global Burden of Disease 2010 Study. *Circulation*. 2014 Feb;129(8):837–47.
3. Ball J, Carrington MJ, McMurray JJ V, Stewart S. Atrial fibrillation: profile and burden of an evolving epidemic in the 21st century. *Int J Cardiol*. 2013 Sep;167(5):1807–24.
4. Lip GYH, Brechin CM, Lane DA. The global burden of atrial fibrillation and stroke: a systematic review of the epidemiology of atrial fibrillation in regions outside North America and Europe. *Chest*. 2012 Dec;142(6):1489–98.
5. Fauchier L, Philippart R, Clementy N, Bourguignon T, Angoulvant D, Ivanov F, et al. How to define valvular atrial fibrillation? *Arch Cardiovasc Dis*. 2015 Oct;108(10):530–9.
6. Molteni M, Friz HP, Primitz L, Marano G, Boracchi P, Cimminiello C. The definition of valvular and non-valvular atrial fibrillation: Results of a physicians' survey. *Europace*. 2014 Oct;16(12):1720–5.
7. Ruff CT, Giugliano RP, Braunwald E, Hoffman EB, Deenadayalu N, Ezekowitz MD, et al. Comparison of the efficacy and safety of new oral anticoagulants with warfarin in patients with atrial fibrillation: A meta-analysis of randomised trials. *Lancet*. 2014 Mar;383(9921):955–62.
8. Hart RG, Benavente O, McBride R, Pearce LA. Antithrombotic therapy to prevent stroke in patients with atrial fibrillation: A meta-analysis. *Ann Intern Med*. 1999 Oct;131(7):492–501.
9. Das M, Panter L, Wynn GJ, Taylor RM, Connor N, Mills JD, et al. Primary Care Atrial Fibrillation Service: Outcomes from consultant-led anticoagulation assessment clinics in the primary

- care setting in the UK. *BMJ Open*. 2015 Dec;5(12):e009267.
10. Huisman M V., Rothman KJ, Paquette M, Teutsch C, Diener HC, Dubner SJ, et al. Antithrombotic treatment patterns in patients with newly diagnosed nonvalvular atrial fibrillation: The GLORIA-AF Registry, phase II. *Am J Med*. 2015;128(12):1306-1313.e1.
11. Wilke T, Groth A, Mueller S, Pfannkuche M, Verheyen F, Linder R, et al. Oral anticoagulation use by patients with atrial fibrillation in Germany: Adherence to guidelines, causes of anticoagulation under-use and its clinical outcomes, based on claims-data of 183,448 patients. *Thromb Haemost*. 2012 Jun;107(6):1053-65.
12. Ye S, Wang T, Liu A, Yu Y, Pan Z, Gu J. A study of knowledge, attitudes, and practices of primary care physicians toward anticoagulant therapy in patients with non-valvular atrial fibrillation in Shanghai, China. *BMC Fam Pract*. 2020;21(1):1-7.
13. Kassianos G, Arden C, Hogan S, Dew R, Fuat A. Current management of atrial fibrillation: An observational study in NHS primary care. *BMJ Open*. 2013 Nov;3(11):3004.
14. Alshammari A, Pmsh A. Assessment of Family Physician's Knowledge, Attitude and Barriers to the use of Oral Anticoagulation Therapy among Atrial Fibrillation Patients in Riyadh City.
15. Olesen JB, Lip GYH, Hansen ML, Hansen PR, Tolstrup JS, Lindhardsen J, et al. Validation of risk stratification schemes for predicting stroke and thromboembolism in patients with atrial fibrillation: Nationwide cohort study. *BMJ*. 2011 Feb;342(7792):320.
16. Lip GYH, Frison L, Halperin JL, Lane DA. Comparative validation of a novel risk score for predicting bleeding risk in anticoagulated patients with atrial fibrillation: The HAS-BLED (hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile INR, elderly, drug. *J Am Coll Cardiol*. 2011 Jan;57(2):173-80.
17. Karcher R, Berman AE, Gross H, Hess DC, Jauch EC, Viser PE, et al. Addressing Disparities in Stroke Prevention for Atrial Fibrillation: Educational Opportunities. *Am J Med Qual*. 2016 Jul;31(4):337-48
18. Mekaj YH, Mekaj AY, Duci SB, Miftari EI. New oral anticoagulants: Their advantages and disadvantages compared with vitamin K antagonists in the prevention and treatment of patients with thromboembolic events. *Ther Clin Risk Manag*. 2015 Jun;11:967-77.
19. January CT, Wann LS, Calkins H, Chen LY, Cigarroa JE, Cleveland JC, et al. 2019 AHA/ACC/HRS Focused Update of the 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart . *J Am Coll Cardiol*. 2019 Jul;74(1):104-32.
20. Chang G, Xie Q, Ma L, Hu K, Zhang Z, Mu G, et al. Accuracy of HAS-BLED and other bleeding risk assessment tools in predicting major bleeding events in atrial fibrillation: A network meta-analysis. *J Thromb Haemost*. 2020 Apr;18(4):791-801.
21. Harrington AR, Armstrong EP, Nolan PE, Malone DC. Cost-effectiveness of apixaban, dabigatran, rivaroxaban, and warfarin for stroke prevention in atrial fibrillation. *Stroke*. 2013;44(6):1676-81.
22. Liao C Te, Lee MC, Chen ZC, Ku LJE, Wang J Der, Toh HS. Cost-effectiveness analysis of oral anticoagulants in stroke prevention among patients with atrial fibrillation in Taiwan. *Acta Cardiol Sin*. 2020 Jan;36
23. Jarrar Y. PRIMARY CARE PHYSICIANS' KNOWLEDGE TOWARD PHARMACOGENETICS IN JORDAN. *Jordan Med J*. 2019;53(2). Accessed December, 10, 2021. <https://journals.ju.edu.jo/JMJ/article/view/101091>

Table 1. Demographic Characteristic of the Participants

Variable		Frequency (%)
Sex	Female	65(43.3)
	Male	85(56.7)
Age	< 30 years	87(58)
	30~39 years	27(18)
	40~49 years	29(19.3)
	50~59 years	3(2)
	≥60 years	4(2.7)
Highest Education	Bachelor's degree	91(60.7)
	Master's degree	11(7.3)
	PhD degree	48(32)
Professional title	Intern	25(16.9)
	Resident	53(35.8)
	Physician	44(29.7)
	Associate senior physician	16(10.8)
	Chief Physician	10(6.8)
Types of Health centers	Rural	18(12)
	Urban	42(28)
	The Urban-Rural	90(60)
Working Years	< 5 years	81(54)
	5~10 years	24(16)
	10~15 years	5(3.3)
	15~20 years	29(19.3)
	20~25 years	3(2)
	>25 years	8(5.3)
Have you attended training on the usage of anticoagulants for AF patients?	No	52(34.7)
	Yes	98(65.3)
How many AF patients have you had in the past year?	1~9	43(33.3)
	10~19	16(12.4)
	20~49	20(15.5)
	50~99	14(10.9)
	100~149	8(6.2)
	≥150	28(21.7)

Table 2. The scores on the KAP questionnaire (knowledge, attitude, and practice)

	Scores		
	Poor ≤39% n (%)	Fair 40-69% n (%)	Good ≥70% n (%)
Knowledge	95 (63.3)	55 (36.7)	0 (0.0)
Attitude	0 (0.0)	33 (22)	117 (78)
Practice	0 (0.0)	85 (56.7)	65 (43.3)

Table 3. The participants' knowledge of OAC therapy in NVAF patients

Knowledge items	Frequency (%)
1 Do you know how to diagnose AF?	3 (2)
2 Which score tool can be used to predict stroke risk in AF patients?	48 (32)
3 Which score tool can be used to predict bleeding risk in AF patients?	40 (26.7)
4 What risk factors does CHADS2 score include?	55 (36.7)
5 What risk factors does CHADS2-VASc score include?	54 (36)
6 What risk factors does HAS-BLED score include?	10 (6.7)
7 Which indicator should be monitored in AF patients with warfarin?	46 (30.7)
8 How often should you monitor coagulation function in AF patients with long-term warfarin therapy at a stable period?	24 (16)
9 What's the target range of INR in NVAF patients with warfarin under 75 years old?	75 (50)
10 Which factor is susceptible to the anticoagulation effect of warfarin?	46 (30.7)
11 Which antagonist antagonizes warfarin's anticoagulation?	115 (76.7)
12 Which of these medications is one of the new oral anticoagulants (NOAC)?	27 (18)

Table 4. Binary regression of KAP levels

	Knowledge (poor vs. fair)			Attitude (fair vs. good)			Practice (fair vs. good)		
	Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
Working years 5 years or more compared to less than 5 years	12.54**	5.32	29.59	4.05*	1.63	10.05	12.52**	5.27	29.77
Have you attended training on the usage of anticoagulants for AF patients? Yes compared to No	4.52*	1.65	12.34	NS	-	-	5.41**	1.98	14.77
Health centers Rural compared to Urban	NS	-	-	NS	-	-	9.25*	1.73	49.62

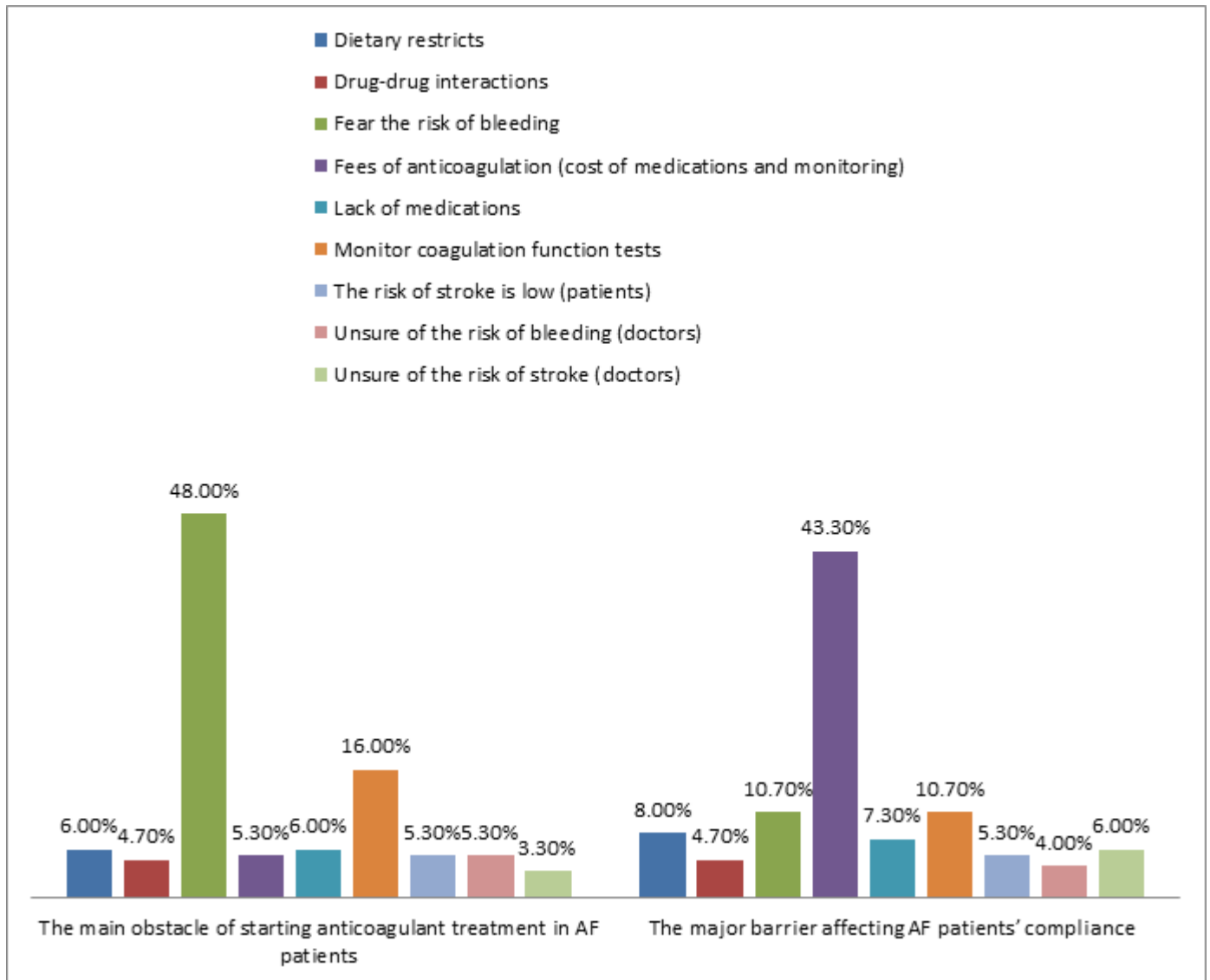


Figure 1. The main barriers for starting OAC therapy and affecting patients' compliance

Supplemental Digital Content 1 and 2: docx.

Table 1. Attitude item score of the participants on anticoagulant therapy for NVAF patients

Attitude Items	Min	Max	Mean (\pm SD)
1 The type of atrial fibrillation would affect a doctor's decision to initiate anticoagulant therapy and choice of oral anticoagulant.	1	5	3.21 (\pm 1.29)
2 It is necessary to use a stroke score tool to assess the risk of stroke in AF patients before anticoagulant therapy.	1	5	3.94 (\pm 1.28)
3 It is necessary to use a bleeding score tool to assess the risk of bleeding in AF patients before anticoagulant therapy.	1	5	3.98 (\pm 1.24)
4 I am more concerned about the risk of bleeding in NVAF patients than the risk of stroke in NVAF patients	1	5	3.19 (\pm 1.29)
5 I think it's important for AF patients to understand the risk of stroke and bleeding in patients with AF.	1	5	4.16 (\pm 1.31)
6 I think it's important for AF patients to reduce the risk of stroke and bleeding due to atrial fibrillation."	1	5	4.26 (\pm 1.18)
7 It is necessary to tell AF patients about medication and food that affect warfarin's anticoagulant effects.	1	5	4.38 (\pm 1.14)
8 I fully understand the views of AF patients on reducing the risk of stroke and bleeding caused by warfarin therapy.	1	5	4.2 (\pm 1.01)
9 I think novel oral anticoagulants (NOAC) have a lower risk of bleeding than warfarin.	1	5	3.31 (\pm 1.54)
10 I think novel oral anticoagulant (NOAC) are easier to administer than warfarin.	1	5	3.82 (\pm 1.35)
11 I hope to have more knowledge to discuss the advantages and disadvantages of stroke, bleeding risk and anticoagulation regimen with AF patients.	1	5	4.17 (\pm 1.23)
12 I think doctors can improve the standard anticoagulant treatment rate in AF patients after training in atrial fibrillation and anticoagulation knowledge.	1	5	4.29 (\pm 1.05)

Table 2. Practice item score of the participants on anticoagulant therapy for NVAF patients

Practice Item	Min	Max	Mean (\pm SD)
1 Have you ever made differential diagnosis according to the duration of the onset of atrial fibrillation when you deal with AF patients?	1	4	2.59 (\pm 0.96)
2 Have you ever made differential diagnosis between valvular AF and non-valvular AF in AF patients when you deal with AF patients?	1	4	2.67 (\pm 1.22)
3 Do you use stroke risk score tools to assess stroke risk in AF patients?	1	4	2.83 (\pm 1.17)
4 Do you use bleeding risk score tools to assess bleeding risk in AF patients?	1	4	2.89 (\pm 1.12)
5 For AF patients treated with warfarin, the INR is maintained at 1.1-2.0. Would you increase the warfarin dose for this patient?	1	4	2.83 (\pm 1.12)
6 For AF patients treated with warfarin, the INR is maintained at 3.5-5.5. Would you decrease the warfarin dose for this patient?	1	4	3.15 (\pm 0.97)
7 A 75-year-old male NVAF patient, with hypertension and no history of diabetes and cardiovascular disease, would you give this patient warfarin for anticoagulant treatment?	1	4	2.59 (\pm 0.98)
8 A 75-year-old female NVAF patient, with a history of hypertension, congestive heart failure and TIA, 3 years ago. Ultrasound indicated aortic atherosclerosis and atrial enlargement. Would you give this patient oral anticoagulant therapy?	1	4	3.31 (\pm 0.93)
9 If an NVAF patient at high-risk for thrombus formation had gastrointestinal bleeding 3 months ago and has stopped bleeding for 1 week, would you give this patient oral anticoagulant therapy?	1	4	2.12 (\pm 0.95)
10 The AF patient in item E8 had nose bleeds once and gum bleeds occasionally when brushing his teeth. Would you give this patient warfarin treatment?	1	4	2.45 (\pm 0.82)
11 The AF patient in item E8 has had coronary stent implantation for 1 month, would you give the patient dual antiplatelet and warfarin therapy?	1	4	2.5 (\pm 0.89)
12 The AF patient in E8 item with ACS has had coronary stent implantation and has been stable for 1 year. Would you give this patient mono-antiplatelet and warfarin therapy?	1	4	2.77 (\pm 0.77)
13 A 68-year-old hypertensive female patient with recurrent episodes of paroxysmal atrial fibrillation and without previous medical history. Would you give this patient oral anticoagulant therapy?	1	4	2.66 (\pm 0.83)
14 Have you often told AF patients who use warfarin therapy about the food and drugs that interact with warfarin?	1	4	3.08 (\pm 1.00)
15 Have you ever actively communicated with AF patients about increasing the risk of AF-related stroke and anticoagulation therapy?	1	4	2.75 (\pm 0.93)
16 Have you ever used different methods, such as pamphlets, health lectures and education, to educate AF patients about the risk of stroke and bleeding related to AF and anticoagulant treatment?	1	4	2.25 (\pm 0.87)
17 Have you ever attended relevant training or lectures about atrial fibrillation diseases and anticoagulation therapy?	1	4	2.57 (\pm 0.93)
18 Will you attend training about AF disease and anticoagulation therapy?	1	4	2.93 (\pm 1.09)