

Knowledge and Adherence to Oral Anticoagulant Therapy in Patients with Atrial Fibrillation

Nahla Mohammed Hashem Elkerdawy, Neamatallah Gomaa Ahmed, Asmaa Mohamed Khorais

Department of Medical –Surgical Nursing, Faculty of Nursing - Ain Shams University

Corresponding author: Nahla Mohammed Hashem Elkerdawy, Mobile: 01013842581;

Email: ahmedelshalym@gmail.com

Abstract

Background: Atrial fibrillation (AF) is an arrhythmia characterized by abnormal and chaotic electrical pulse generation observed in the upper heart chambers. This condition is the most common heart rhythm disorder, with prevalence rates of 2.3-3.4% in the general population. Atrial fibrillation often leads to the development of blood clots, heart failure, other cardiovascular complications, hospitalizations, mortality, and overall increased healthcare expenditures. **Objective:** To assess patients' knowledge and adherence levels to oral anticoagulant therapy in patients with atrial fibrillation. **Subjects and Methods:** Setting: This study was conducted at outpatient cardiac clinics at Elmerly hospital in Alexandria University. Subject: The study included a purposive sample composed of 55 patients with atrial fibrillation on oral anticoagulant therapy. Data were collected using the following tools: -Tool I: Patient's interviewing questionnaire. Tool-II Morisky Medication Adherence Scale (MMAS). **Results:** 58.2% of the studied patients age were ≥ 50 years. 58.2% were males and 85.5 of them were married. 61.8% had were illiterate and primary education, 72.7% were an employee and 65.5% live in rural areas. 65.5% of the studied patients mentioned that they had insufficient income. 63.6% of the studied patients had unsatisfactory level of knowledge regarding OACs. 50.9% of the studied patients had high level of adherence, 29.1% of the studied patients had medium level of adherence while 20% of the studied patients had low level of adherence regarding oral anticoagulant therapy. There was statistical significance relation between patients' total level of knowledge and their age, education level and treatment regimen. There was statistical significance relation between patients' total adherence level and their age, education level, treatment regimen, monthly income and residence. There was a positive relation between patients' total level of knowledge and their total adherence level. **Conclusion:** Based on the findings of the current study, it can be concluded that, more than three fifth of the studied patients had unsatisfactory total knowledge score about OAC, and more than half of them had good adherence levels (63.6%, and 50.9% respectively). Results highlighted positive significant relations between patients' adherence to OAC and their level of knowledge.

Keywords: Atrial fibrillation, radiofrequency ablation, venous thromboembolism, oral anticoagulants

Introduction

Atrial fibrillation (AF) is an arrhythmia characterized by abnormal and chaotic electrical pulse generation observed in the upper heart chambers. This condition is the most common heart rhythm disorder, with prevalence rates of 2.3-3.4% in the general population. Atrial fibrillation often leads to the development of blood clots, heart failure, other cardiovascular complications, hospitalizations, mortality, and overall increased healthcare expenditures (Hendriks & Heidbüchel, 2019).

Atrial fibrillation is often treated using radiofrequency ablation (RFA). This technique is applied in a subgroup of patients in an attempt to restore normal sinus rhythm. Although RFA has proven to be effective in the treatment of AF, the risk for thromboembolic events such as stroke

increases substantially in patients, especially during the first month after the procedure was performed. This increased risk can be attributed to local perilesional inflammation and scar tissue formation caused within the atria (Ferguson et al., 2016).

Thromboembolic events commonly occur in critically ill patients, although they don't consistently present with specific signs and symptoms but, they are associated with high morbidity and mortality. Anticoagulants are used to prevent and treat a wide range of thromboembolic diseases. Anticoagulant agents are the mainstay of the prevention and treatment of venous thromboembolism (VTE), and they are also used for stroke prevention in atrial fibrillation, acute coronary syndrome (ACS), and anticoagulation of prosthetic valves (Hendriks & Heidbüchel, 2019).

The use of anticoagulants is a decision based upon the risks and benefits of anticoagulation. The biggest risk of anticoagulation therapy is the increased risk of bleeding. Bleeding dividing into minor complications of bleeding as excessive bruising, gum bleeding, minor nosebleeds and prolonged bleeding from minor wounds and serious complications of bleeding as compartment syndrome, gastrointestinal bleeding, severe nosebleeds, post-operative bleeding, and intracranial hemorrhage (*Yones & Ahmed, 2019*),

Thus, anticoagulant therapy requires constant vigilance and careful monitoring. Nurses must understand and use the anticoagulant administration practices particular to their practice and place of employment. These drugs require close attention to administer safely and effectively as medication errors and adverse effects are uncommon with use of the anticoagulants. Anticoagulant as a drug which has a high risk of causing harm if it is used incorrectly, and includes warfarin in its list of drugs which have a heightened risk of causing significant patient harm when used in error (*Keller et al., 2020*).

Nurses closely observe any indications of bleeding including oozing at intravenous injection sites, epistaxis, bleeding gums, hematuria, monitor clotting studies as ordered. The partial thromboplastin time (PTT) if the patient is receiving heparin, prothrombin time (PT) and international normalization ratio (INR) if the patient is receiving warfarin, report values outside the desired range to the doctor before the next schedule anticoagulant dose (*Keller et al., 2020*).

Significance of the study

Atrial fibrillation (AF) is the most common cardiac arrhythmia and affects 1–2% of the adult population. The lifetime risk for development of AF is one in four for those over the age of 40 years. The prevalence of AF rises with advancing age, increasing from, 1% in those, 60 years of age to nearly 20% in those 85 and older. Thromboembolic complications particularly ischemic stroke and systemic thromboembolism are a major cause of morbidity and mortality in patients with AF. Patients with AF have a four- to five-fold higher risk for stroke than those without AF. Up to 15% of all strokes are due to AF, and strokes in patients with AF have worse outcomes with higher mortality rates than strokes in patients without AF (*Mokhtari et al., 2022*).

Adequate adherence and persistence to oral anticoagulation treatment in patients with AF is crucial as studies have demonstrated that stringent treatment adherence reduces treatment failure, number of hospitalizations and mortality as well as the cost of health care (*Chen et al., 2021*).

In 2018 (500) patients with atrial fibrillation admitted to The Main Alexandria University, 150 of them were re-admitted to the hospital (*The statistical records of Main Alexandria University, 2018*). Therefore, the current study will be carried out in order to assess patients' knowledge and adherence level regarding oral anticoagulant therapy.

Aim Of The Study

This study aims to assess knowledge and adherence levels to oral anticoagulant therapy in patients with atrial fibrillation.

Subjects And Methods

I. Technical design:

The technical design includes research design, setting, subject, and tools of data collection.

Research design:

Descriptive exploratory design was utilized to answer the research questions. Descriptive research describes a phenomenon and its characteristics. This research is more concerned with what rather than how or why something has happened. Therefore, observation and survey tools are often used to gather data (*Nassaji, 2015*).

Research questions:

1. What are the patients' level of knowledge regarding oral anticoagulant therapy?
2. What are the adherence levels to oral anticoagulant therapy?

Setting:

This study was conducted at outpatient cardiac clinics at Elmerly hospital in Alexandria University.

Subject:

The study included a purposive sample composed of 55 patients with atrial fibrillation on oral anticoagulant therapy.

Sample size calculation:

Study subjects include a representative of the total patients in outpatient cardiac clinics. Attendance rate (N=437) at Elmery Hospital in Alexandria University; were hospitalized during the period 2019. Based on sample size equation 55 patients will be participated in the study (*Hoglund et al., 2011*).

The sample size was calculated by adjusting the power of the test to 80% and the confidence interval to 95% with margin of error accepted adjusted to 0.05% and a known total population of 55 patients using the following equation:

- Type I error (α) = 0.05
- Type II error (B) = 0.2
- With power of test 0.80

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times (d^2 \div z^2) \right] + p(1-p) \right]}$$

$$55 = \frac{437 \times 0.043(1-0.043)}{\left[\left[437 - 1 \times (0.05^2 \div 1.96^2) \right] + 0.043(1-0.043) \right]}$$

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96

d= The error rate is equal to 0.05

p= Ratio provides a neutral property = 0.043

Sample type a purposive sample technique was used in the study. **Patients were selected according to the following criteria:**

Inclusion criteria:

- Adult patients of both gender.
- Patients able to communicate.
- Patients agree to participate in the study.

Exclusion criteria:

- Hemodynamically unstable patients.
- Patients disagree to participate in the study.
- Patients with mental disorders.

Tools of data collection:

Data were collected using the following tools:

Tool I: Patient's interviewing questionnaire:

It was used to assess patients' level of knowledge to oral anticoagulant therapy adapted and modified by the researcher after reviewing the relevant references and recent literatures, it included three parts:

First part: this part was concerned with patient's socio-demographic characteristics (age, gender, marital status, educational level, occupation, average monthly income and place of residence).

Second part this part was concerned with patients' present and past health history. It included (12) closed ended questions, seven for past history and five for present history. Past history included the items regarding comorbid conditions, previous operation, previous admission with atrial fibrillation and medical treatment. Present history included questions that assess patient's chief complaint and causes of current admission (*Sambu, 2018*).

Third part: this tool was adapted from (*Sambu, 2018*). and modified by the researcher. it was concerned with the assessment of patient's knowledge regarding disease process and factors that aggravate AF.

It consisted of three parts 1- knowledge about atrial fibrillation (6 questions) 2- knowledge about oral anticoagulant therapy (13 questions) 3- knowledge about vitamin k-antagonist (warfarin) therapy (7 questions). Questions have patient's response yes or no.

- 1- Knowledge about atrial fibrillation: questions related to definition, symptoms, causes, treatment, complication of the disease.
- 2- Knowledge about oral anticoagulant therapy: questions related to general information about the effect of the medication, possible side effect, interactions with food, interactions with other medications; and lifestyle
- 3- Knowledge about vitamin k-antagonist (warfarin) therapy: questions related to complication of the medicines, follow up, possible side effects and interactions with food.

Scoring system:

Scoring system regarding the patients' knowledge as the following: One grade was given for the correct answer and zero for the incorrect answer with total grade 26 for total (26) questions. The total level of patients' knowledge score was categorized as follows:

- $\geq 70\%$ was considered satisfactory level of knowledge (≥ 18 degree).
- $<70\%$ was considered unsatisfactory level of knowledge (< 18 degree).

Tool-II Morisky Medication Adherence Scale (MMAS): - it's adopted from (*Krousel-Wood et al., 2015*), it was used to assess patients' adherence levels regarding oral

anticoagulant therapy. consisted of 8 MCQ questions.

Scoring system:

- Scoring system regarding the patients' adherence as the following: One grade was given for the (Yes) answer and zero for the (No) answer with total grade 8 for total (8) questions. The total level of patients' adherence score was categorized as follows according to (*Tan et al., 2016*).
- Score of 8 grades reflecting high adherence level.
- Score from 6 to 7 grades reflecting medium adherence level.
- Score less than 6 grades reflecting low adherence level.

II. Operational design:

The operational design included preparatory phase, content validity and reliability, pilot study and field work.

A. Preparatory phase:

It included reviewing current and past, local and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines, and developing tools of data collection. Permission for data collection and implementation of the study in Main Alexandria University Hospital was obtained to the hospital administrative personnel by the submission of a formal letter from the faculty of nursing, Ain Shams University.

B. Content validity and reliability:

Content validity:

It was ascertained by a group of seven experts from medical surgical nursing department, Faculty of Nursing, Ain shams university. Juries were from different academic categories three professors, two assistant professors and two lecturers. The experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity, or applicability of the tools. Experts response were either agreed or disagreed or agreed with modification for the face validity and content validity, about 71.4% of the experts were in agreement with the proposed tools, required modification were done.

Reliability:

Reliability of tools were tested statistically using Cronbach's Alpha which is a model of internal consistency and its normal range

between 0 and 1 (value more than 0.5 acceptable reliability), Tool-I patient's interviewing questionnaire was reliable at (0.799) and tool-II Morisky Medication Adherence Scale (MMAS) was reliable at 0.823.

Pilot study:

The pilot study was carried out on a group of six patients (10% of the 61 subjects) to test the clarity, applicability, feasibility and relevance of the study tools and to determine the needed time for the application of the tools. The five patients who were included in the pilot study were excluded from the study sample.

Field of work:

The aim of the study was explained and simplified to the patients who agreed to participate in the study prior data collection. The actual work of this study took about 6 months started from May 2021 until November 2021. The data were collected by the researcher through 4 days /week during morning shift in the previously mentioned settings. Each patient was interviewed individually by the researcher for about 30 minutes. The first tool, patient's interview questionnaire filled in by the researcher and it took 10 minutes. The second tool was Morisky Medication Adherence Scale which used to assess patients' adherence levels regarding oral anticoagulant therapy. It took 10 minutes.

Field of work was well organized, quiet, nursing staff and Patients were cooperative.

III. Administrative design:

An official permission was issued from the faculty of nursing Ain Shams University to the director of Alexandria University Hospital and director of the outpatient clinics which the study was conducted, explaining the purpose of the study and requesting the permission for data collection from the study group. Meeting and discussion were held by the researcher to explain the aim, the nature and the objectives of the study.

Ethical Considerations:

The ethical research considerations in this study included the following:

The research approval was obtained from the faculty ethical committee before starting the study. The researcher clarified the aim of the study to patients included in the study before starting. The researcher assured maintaining anonymity and confidentiality of subjects' data of the patients included in the study. Patients were

informed that they were allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time.

IV. Statistical design:

The collected data were organized; categorized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version (20.0), also Microsoft office Excel is used for data handling and graphical presentation. Quantitative data were expressed as a mean \pm standard deviation (SD), and qualitative data were expressed as frequency and percentage.

Results

Table (1) reveals that, (58.3%) of the studied patients their ages ≥ 50 years, (58.2%) were male and (85.5%) of them were married. The table also shows that (32.7%) had primary education, (45.5%) had a technical work while (27.3%) of them had administrative work. The table also shows that (65.5%) of the studied patients live in rural areas, (65.5%) of them 65.5% of them had insufficient income, (40%) treated through health insurance, (20%) treated through national fund and (40%) depend on their own expenses.

Table (2) shows that, (56.4%) of the studied patients were chronic AF, (85.5%) of them felt palpitations, (76.4%) of them had irregular rhythm on admission. The table also shows that (58.2%) reported that they did not take the prescribed medication regularly and (63.6%) of the studied patients complained during current admission from dyspnea.

Table (3) shows that, (25.5%) of the studied patients had no comorbidity conditions while (23.6%) of them suffered from diabetes and hypertension. The table illustrates that 58.2% had a previous operation, (70.9%) previously admitted to hospital with atrial fibrillation and (63.6%) were smoker. The table also illustrates that (30.9%) of the studied patients taking oral anticoagulant medicine from 1:2 years. The table also shows that, (90.9%) of the studied patients had no previous blood transfusion, (89.1%) of them had no previous radiofrequency ablation.

Table (4) shows that the studied patients had unsatisfactory level of knowledge regarding definition, risk factors, signs and symptoms, (52.7%, 65.5%, 60%) respectively. The table also shows that the studied patients had satisfactory level of knowledge regarding causes, complication and treatment of atrial fibrillation. that (65.6%, 69.1%, 63.6%) respectively.

Figure (1) shows that, (63.6%) of studied patients had unsatisfactory total level of knowledge

- Arithmetic mean: as average describing the central tendency of observation.
- The standard Deviation: as a measure of dispersion of results around the (for quantitative variable).
- Chi-square (X²) test of significance was used in order to compare proportions between qualitative parameters.
- The p-value was considered significant at <0.5 .

regarding atrial fibrillation while (36.4%) of them had satisfactory total level of knowledge.

Table (5) shows that the studied patients had satisfactory level of knowledge regarding name, pharmacological effects, duration of treatment with oral anticoagulant medicines, importance of taking it at the same time daily, stop taking oral anticoagulant once feeling better, interaction between oral anticoagulant and anti-inflammatory medicines, vitamins and herbal medicines, alcohol intake, take a large dose of oral anticoagulant (60%, 67.3%, 85.5%, 68.5%, 83.6%, 63.6%, 76.4%, 63.6%, 60%) respectively. The table also shows that the studied patients had unsatisfactory level of knowledge regarding what to do if forget the dose, health expectation, informing health professional, dentist or surgeon that you are taking this medicines, side effects of oral anticoagulants that (56.4%, 63.6.2%, 58.2%, 70.4%) respectively.

Figure (2) shows that, (69.1%) of studied patients had unsatisfactory total level of knowledge regarding oral anticoagulant therapy while (30.9%) of them had satisfactory total level of knowledge.

Table (6) shows that the studied patients had satisfactory level of knowledge regarding warfarin monitoring, target INR range, follow-up INR, INR values above target range affect health, warfarin interactions with foods, vitamins interactions with foods that (74.5%, 92.7%, 67.3%, 60.0%, 69.1%, 69.1%) respectively. The table also shows that the studied patients had unsatisfactory level of knowledge regarding INR values below target range can affect health (60%).

Figure (3) shows that, (56.4%) of studied patients had unsatisfactory total level of knowledge regarding Vitamin K Antagonist-Warfarin, while (48.6%) of them had satisfactory total level of knowledge.

Figure (4) shows that, (63.6%) of studied patients had unsatisfactory total level of knowledge

while (36.4%) of them had satisfactory total level of knowledge.

Table (7) shows that (98.2%) of the studied patients didn't take oral anticoagulant medication in some days over the past 2 weeks and (76.4%) of the studied patients had a difficulty remembering to take all prescribed medications.

Table (8)

shows that there was statistically significant increase in the percentage of patients with satisfied knowledge in high adherence group

Figure (5) shows that (50.9%) of the studied patients had high level of adherence, (29.1%) of them had medium level of adherence while, (20%) of the studied patients had low level of adherence regarding oral anticoagulant therapy.

than medium and low adherence groups with p-value <0.001.

Table (1): Frequency and percentage distribution of the patients' demographic data (n=55)

Demographic characteristics data		N.	%
Age	18<30	3	5.5%
	30<40yrs	4	7.3%
	40<50yrs	16	29.1%
	≥50	32	58.2%
Mean ± SD	48.42 ± 8.23		
Gender	Male	32	58.2%
	Female	23	41.8%
Marital status	Married	47	85.5%
	Single	8	14.5%
Education	Not read/ write	16	29.1%
	Primary	18	32.7%
	Secondary	13	23.6%
	University	8	14.5%
Type of occupation	Not work	15	27.3%
	Administrative work	15	27.3%
	Technical work	25	45.5%
Income/month/E.P	Enough	19	34.5%
	Not enough	36	65.5%
Residence place	Urban	19	34.5%
	Rural	36	65.5%
Treatment covered by	Own expense	22	40.0%
	At the expense of the government	11	20.0%
	Health insurance	22	40.0%

Table (2): Frequency and percentage distribution of the studied patients regarding present medical history (n=55).

Present medical history		N.	%
Classifications of AF	Acute	16	29.1%
	Chronic(permanent AF)	31	56.4%
	Paroxysmal AF	8	14.5%
Have you ever felt palpitations or tachycardia	Yes	47	85.5%
	No	8	14.5%
	don't know	0	0.0%
Did you feel heart rhythm	Regular	4	7.3%
	Irregular	42	76.4%
	don't know	9	16.4%
Patient complains during current admission	Palpitation	8	14.5%
	Chest pain	12	21.8%
	Dyspnea	35	63.6%
Causes of current admission to hospital	Not adherence of medication	32	58.2%
	Thyroid dysfunction	7	12.7%
	Stress	10	18.2%
	Other(Hypertension or ischemic heart disease)	6	10.9%

Table (3): Frequency and percentage distribution of the studied patients regarding past medical history (n=55).

Past medical history		N.	%
Comorbidity conditions	No	14	25.5%
	Diabetes	9	16.4%
	Hypertension	4	7.3%
	Diabetes+ hypertension	13	23.6%
	Asthma	5	9.1%
	Heart diseases	5	9.1%
	Thyroid dysfunction	4	7.3%
	Renal failure	1	1.8%
History of pervious operations	No	23	41.8%
	Yes	32	58.2%
Pervious hospitalization	No	16	29.1%
	Yes	39	70.9%
Smoking	No	20	36.4%
	Yes	35	63.6%
Pervious blood transfusion	No	50	90.9%
	Yes	5	9.1%
pervious radiofrequency ablation	No	49	89.1%
	Yes	6	10.9%
How long have you been taking an oral anticoagulant medicine	<3 months	13	23.6%
	3months: <1 year	14	25.5%
	1 year: < 2 year	17	30.9%
	≥2years	11	20.0%

Table (4): Patients' level of knowledge regarding atrial fibrillation (n=55).

Items	Satisfactory		Unsatisfactory	
	N	%	N	%
Definition of AF	26	47.3	29	52.7
Causes of AF	36	65.5	19	34.5
Risk factors	19	34.5	36	65.5
Signs and symptoms of AF	22	40	33	60
Complications of AF	38	69.1	17	30.9
Treatment of AF	35	63.6	20	36.4

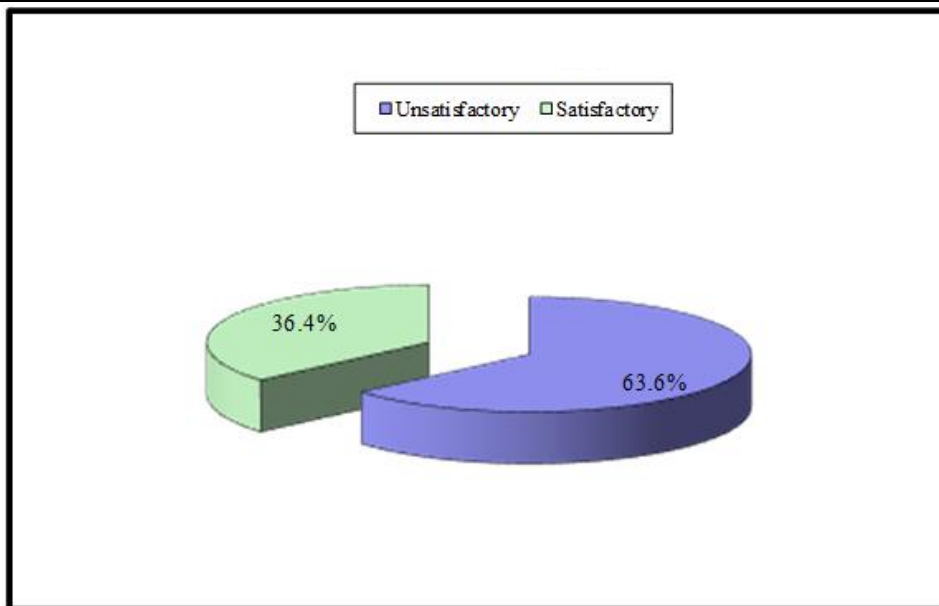
**Figure (1):** Patients' total level of knowledge regarding atrial fibrillation

Table (5): Patients' level of knowledge regarding oral anticoagulant therapy.

Items	Satisfactory		Unsatisfactory	
	N	%	N	%
Name of anticoagulant drug	33	60	22	40
Effect and the importance of oral anticoagulant for you as prescribed	37	67.3	18	32.7
Duration of treatment with anticoagulant drug	47	85.5	8	14.5
Importance of taking oral anticoagulant drug daily at the same time	37	68.5	17	31.5
What do you do if you forget to take your medicine at the scheduled time?	24	43.6	31	56.4
Is your health expected to worsen if you forget to take the medicines?	20	36.4	35	63.6
Is it appropriate to stop taking this medicine once you feel better?	46	83.6	9	16.4
Is it safe to take anti-inflammatory medicines like ibuprofen (Nurofen® or Advil®) while you are taking this medicine?	35	63.6	20	36.4
Is it safe to take vitamin supplements and herbal medicines with oral anticoagulant without consulting your doctor?	42	76.4	13	23.6
Drinking too much alcohol increase the risk of side effects of oral anticoagulant medicines?	35	63.6	20	36.4
Would you inform a surgeon, dentist or other health professional that you are taking oral anticoagulant before undergoing surgery or a procedure?	23	41.8	32	58.2
side effects of oral anticoagulant medications?	16	29.6	38	70.4
what to do when you accidentally take a large dose of oral anticoagulant?	33	60.0	22	40.0

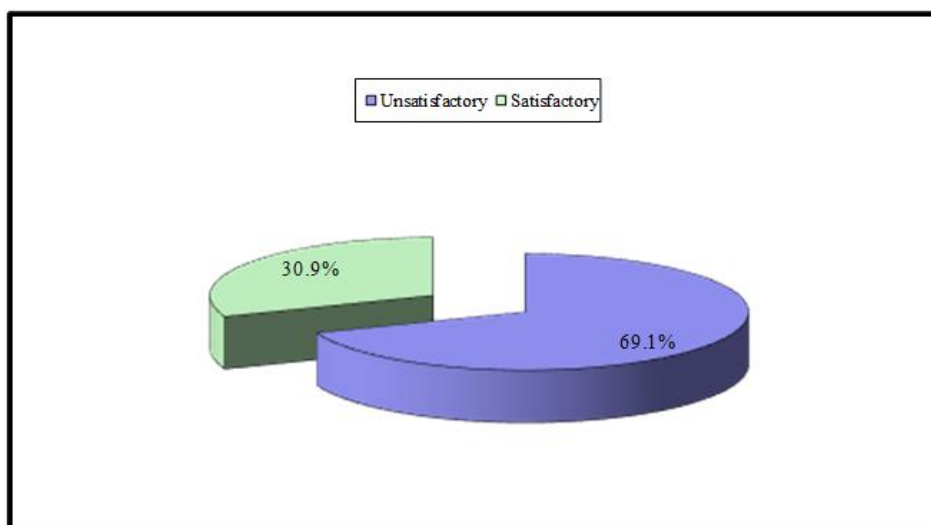
**Figure (2):** Patients' level of knowledge regarding oral anticoagulant therapy.

Table (6): Patients’ level of knowledge regarding Vitamin K Antagonist-Warfarin.

Items	Satisfactory		Unsatisfactory	
	N	%	N	%
Warfarin is monitored by INR	41	74.5	14	25.5
Target INR range for patients with atrial fibrillation	51	92.7	4	7.3
Importance to Follow up INR value	37	67.3	18	32.7
Increase in INR value above target range has negative effect on health	33	60.0	22	40.0
Decrease in INR values below target range has negative effect on health	22	40.0	33	60.0
Is it possible for what you eat to affect your warfarin therapy?	38	69.1	17	30.9
Vitamin has a significantly effect on your anticoagulant therapy ?	38	69.1	17	30.9

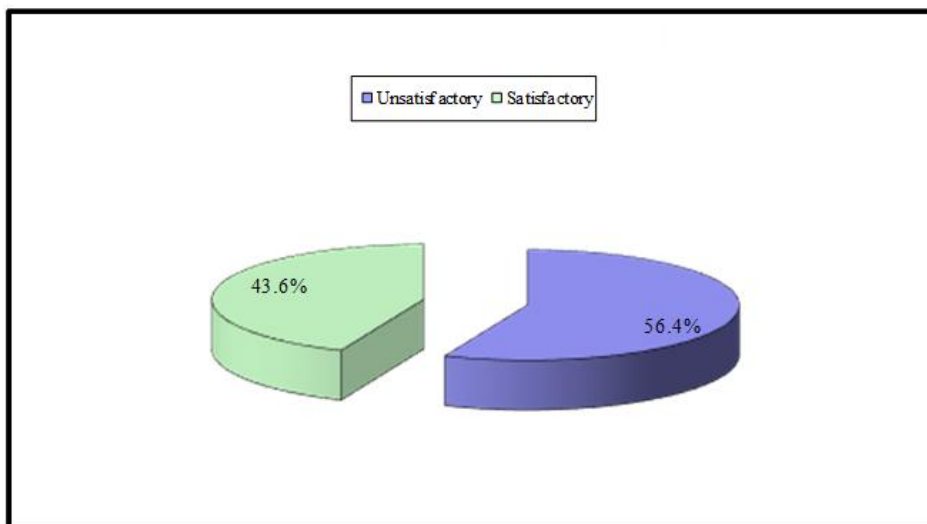


Figure (3): Patients’ level of knowledge regarding Vitamin K Antagonist-Warfarin.

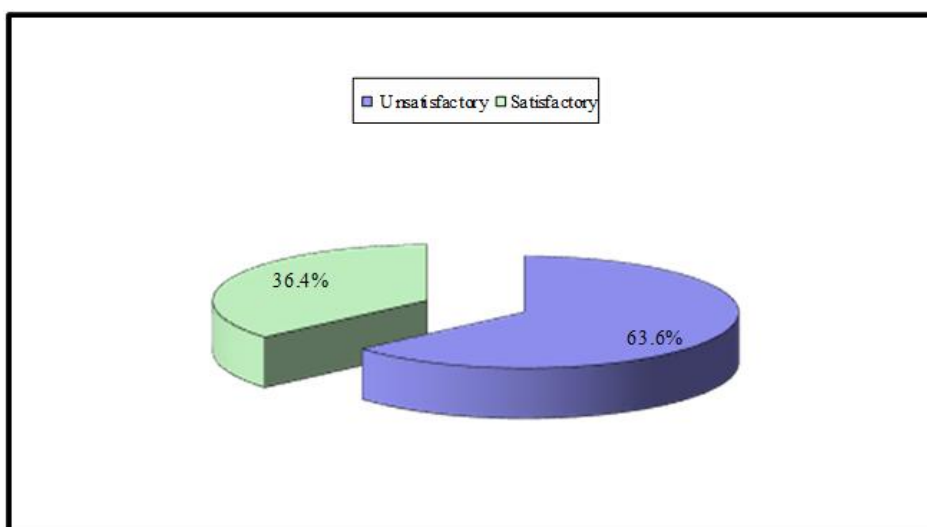


Figure (4): Patients’ level of knowledge regarding AF and anticoagulant therapy (n=55).

Table (7): Patients’ level of adherence regarding oral anticoagulant therapy (n=55).

Adherence items	Yes		No	
	N	%	N	%
Do you sometimes forget to take your prescribed medications?	52	94.5	3	5.5
Over the past 2 weeks, were there any days when you didn’t take your prescribed medications?	54	98.2	1	1.8
Have you stopped taking medications because you feel worse when you took it?	48	87.3	7	12.7
When you travel or leave home, do you forget to bring along your medications?	47	85.5	8	14.5
Did you take your prescribed medications yesterday?	49	89.1	6	10.9
When you feel like your health under control do you sometimes stop taking your medics?	43	78.2	12	21.8
Do you feel hassled about sticking to your prescribed treatment plan?	45	81.8	10	18.2
How often do you have difficulty remembering to take all prescribed medication s?	42	76.4	13	23.6

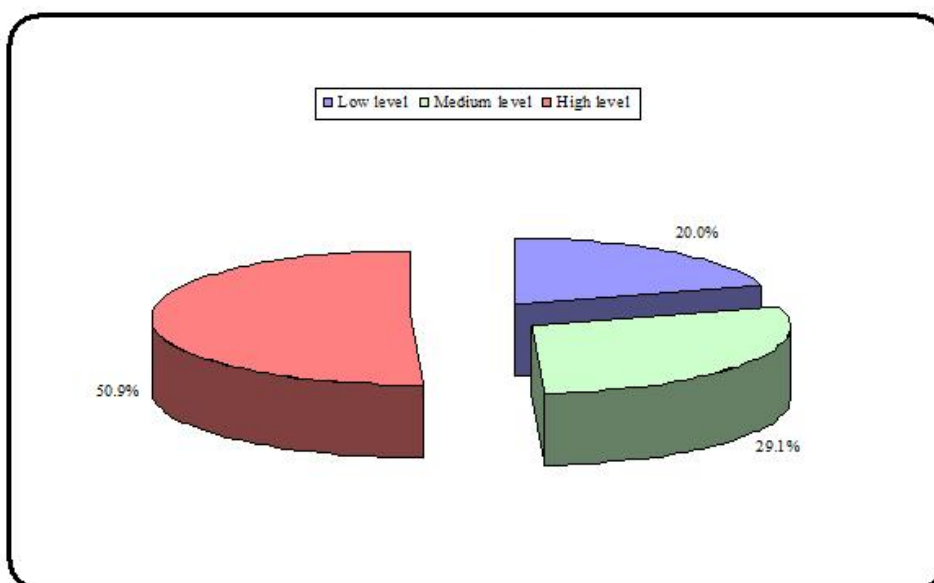


Figure (5): Patients according to their total adherence level(n=55).

Table (8): Relation between total adherence of the studied patients with their knowledge about AF, oral anticoagulant, warfarin and their total knowledge level.

Knowledge		Total adherence						χ^2	P-value
		Low level		Medium level		High level			
		N.	%	N.	%	N.	%		
About AF	Unsatisfactory	11	100.0	16	100.0	8	28.6	30.306	0.000**
About oral anticoagulant	Unsatisfactory	11	100.0	14	87.5	13	46.4	14.194	0.001**
About warfarin	Unsatisfactory	11	100.0	15	93.8	5	17.9	34.489	0.000**
Total knowledge	Unsatisfactory	11	100.0	15	93.8	9	32.1	24.557	0.000**

Discussion

Discussing the finding of the current study is categorized under four main parts. **The first part** is concerned with the demographic characteristics and the health history of the studied patients. **The second part** discussed the finding related to the level of knowledge regarding oral anticoagulant therapy in patients with atrial fibrillation. **The third part** discussed the finding related to the level of adherence regarding oral anticoagulant therapy in patients with atrial fibrillation. **The fourth part** discussed the finding related to relation between characteristics of the studied patients, their total Knowledge and their adherence level. Relation between total knowledge of the studied patients and their adherence level.

Part I: Demographic characteristics and health history of the studied patients.

In the relation to demographic characteristics, the results of the present study showed that, more than the half of the studied patients were ≥ 50 years. This finding in the same line with *Siouta. (2013)* who showed that less than two thirds of the study subjects' age ranged from $40 < 60$ years old with a mean age of 54.9 ± 9.88 years. In the researcher's point of view Advanced aging is a high risk factor for atrial fibrillation.

Concerning gender, the current study revealed that more than half of the studied patients were males. This finding is similar to *Smigorowsky, (2019)*, who found that three quarters of the studied patients were males. In the researcher's point of view, the incidence and prevalence of atrial fibrillation increase in males more than females.

Regarding marital status, the current study revealed that more the half of the studied patients were not married. This finding is contraindicated with *Siouta. (2013)*, who reported in his study that the most of patients were married. This finding is also in contraindicated with *Smigorowsky, (2019)*, who reported in his study that the majority of patients were married.

In the relation to educational level, the current study revealed that more than half of the studied patients were illiterate or had primary education. This result is in the same line with *(Yones& Ahmed, 2019)*, who reported that two thirds of the patients were illiterate. In the researcher's point of view low educational level of the studied subjects explains the lack of awareness about the disease and adherence regarding oral anticoagulant therapy.

In the light of patients' occupation, the current study revealed that about three quarter of the studied patients were an employee. This result is similar to *Smigorowsky, (2019)*, who reported that more than half of the patients were farmers.

Regarding patients' residence, the current study revealed that about two thirds of the studied patients lived in rural areas. This finding is similar to *(Yones& Ahmed, 2019)*, who reported that more than half of the patients were from rural area.

Regarding average monthly income, the current study revealed that about two thirds of the patients mentioned that the income does not cover the cost of the treatment and about two thirds of the patients treated through the governmental fund and health insurance. The finding is similar to *Alcuskys, (2019)*, who reported that the most of the patients' income is insufficient. In the researcher's point of view, poor medication adherence is greater in patients with low economic status.

Regarding classifications of AF, the current study revealed that more than half of patients diagnosed as chronic (persistent) AF. The finding is similar to *Panichpathom et al. (2019)*, who reported that more than two thirds of the studied patients diagnosed as persistent AF.

Concerning patient's complaint during current admission, the result revealed that more than half of the patients' chief complains were dyspnea and more than one thirds of patient's complain from palpitation and chest pain. This finding is in agreement with *Paquette, (2020)*, who reported that more than half of patients presented with dyspnea. the researcher's point of view, the most common symptoms of AF are palpitation, dyspnea and chest pain.

Regarding causes of current admission to hospital, the result revealed that more than half of the studied patients reported that they did not take the prescribed medication. This finding is in agreement with *Galvin, (2018)*, who reported that more than half of the patients had inadequate compliance toward medication management and not complies with healthy diet. In the researcher's point of view, patients' non-adherence to medication regimens might be related to poor health literacy and lack of comprehension of treatment benefits, the occurrence of undesired side effects, and the cost of prescribed medicine.

Concerning patients' previous admission to hospital, the current study revealed that more than two thirds of the patients were previously admitted to the hospital with Atrial fibrillation. This result means that the patients did not adhere to medication. This finding is in agreement with *Paquette, (2020)*, who reported that half of the patients had recurrent admitted to the hospital. In the researcher's point of view, patients' non-adherence to medication regimens leads to frequent admission to hospital.

The current study revealed that about two thirds of the patients were smokers. This finding is in agreement with *Galvin, (2018)*, who reported that the greater part of the patients were smokers and another finding in the same line with *Paquette, (2020)*, who reported that almost half of the patients were smokers. In the researcher's point of view, this finding may be related to the patients were from the rural areas where there was a fewer health education about smoking effect on health.

Concerning radiofrequency ablation, the current study revealed that, more than three quarter of the studied patients hadn't radiofrequency ablation. This result is in the same line with *Alcuskys, (2019)*, who reported that three quarters of the studied patients hadn't radiofrequency ablation.

Part II: The findings related to the level of knowledge regarding AF patients on oral anticoagulant therapy

The results showed that, more than two thirds of the studied patients had unsatisfactory level of knowledge regarding oral anticoagulant therapy. This finding is in agreement with *Smet et al. (2018)*, who showed that the majority of patients had unsatisfactory level of knowledge about disease and its therapeutic management.

The results showed that, more than two thirds of the studied patients had unsatisfactory knowledge about definition, sign and symptom and risk factors of atrial fibrillation. In the researcher's point of view these findings might be related to lack of the availability of educational resources for patients

The results showed that, nearly, three quarter of studied patients had unsatisfactory knowledge about oral anticoagulant medication. In the researcher's point of view. In the researcher's point of view these findings might be related to lack of the availability of educational resources for patients.

The results showed that, more than half of the studied patients had unsatisfactory knowledge about Vitamin K Antagonist-Warfarin. In the researcher's point of view these findings might be related to lack of the availability of educational resources for patients.

The results showed that three quarter of patients had satisfactory level of knowledge related to diet rich in vitamin K. This finding is contraindicated with (*Yones & Ahmed, 2019*), who showed that the majority of their patients had poor knowledge regarding nutrition and vitamin K sources. Similar findings were reported by *Paquette, (2020)*, who found that the majority of patients had low knowledge about the influence of diet on OAC.

Part III: The findings related to the level of adherence regarding AF patients on oral anticoagulant therapy

The current study revealed that the majority of the studied patients delayed OAC, and the majority of them forgot to take the drug, and skipped the due date of INR analysis. However, half of the studied patients had either satisfactory or good adherence levels to their prescribed OAC. This could be related to the nature of the disease that necessitates drug adherence to avoid major complications. This finding is contraindicated with, *Smet et al (2018)* who found that few patients had high adherence to OAC therapy.

In the researcher's point of view, patients' non-adherence to medication regimens increase risk for thromboembolic complications.

Part IV: Relation between characteristics of the studied patients, their total knowledge and their adherence. Correlation between total knowledge of the studied patients and their total adherence level.

Regarding to the relation between total knowledge of the studied patients and their adherence level illustrates, there is positive relation between total knowledge of the studied patients and their adherence level. This finding is line with *Smet et al. (2018)*, who stated that promoting patients' knowledge will facilitate compliance and suggested that increasing patients' education regarding disease and treatment modalities might enhance compliance. Another finding in the line with *Ntaios et al. (2017)*, who stated that, the patient's belief about the value and benefit of a treatment may improve markedly when compared with the priority given to the same treatment by the nurse. In the researcher's point of view when the patients have knowledge about disease, this increase awareness and positive adherence.

Conclusion

Based on the findings of the current study, it can be concluded that, more than three fifth of the studied patients had unsatisfactory overall knowledge score about OAC, and more than half of them had high adherence levels. Results highlighted positive significant relations between patients' adherence to OAC and their level of knowledge.

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