

EVALUATION OF WARFARIN KNOWLEDGE IN PATIENTS WITH CHRONIC ATRIAL FIBRILLATION IN OUTPATIENT CARDIOVASCULAR CLINICS AT SPECIALIZED MEDICAL HOSPITAL

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Abstract:

Atrial fibrillation is a major risk factor of stroke. Stroke prevention in atrial fibrillation (AF), most commonly with warfarin, requires maintenance of a narrow therapeutic target (INR 2.0 to 3.0). To ensure safe and effective use, it is vital that patients have a sound understanding of warfarin. Therefore, **the aim of the study** was to determine AF patient's knowledge about using warfarin. **Methods** descriptive correlational cross sectional research design was conducted in the cardiovascular outpatient clinics of Specialized Medical Hospital at Mansoura University. Sociodemographic data sheet & Warfarin knowledge questionnaire was designed after an extensive literature review. It contains 24 questions related to warfarin use and international normalized ratio (INR) test. Convenient sample of this study composed of 104 adult patients of both sexes who met inclusion criteria and face-to-face interviews using standard questionnaires were administered to determine the demographic characteristics, medical history and the patient's knowledge of warfarin therapy. **Results** the result revealed that Patients' warfarin knowledge was poor, with an overall score of 9.9 ± 6.32 (range 0-24). Knowledge deficits were greater in female subjects, older subjects, subjects with less formal education, subjects live in rural, subjects don't work and subjects with long duration of warfarin use. **Conclusion** There is an increasing need to introduce effective education programs to current patients in order to enhance and update their knowledge with regard to warfarin therapy and INR test.

Key words: Atrial Fibrillation, oral anticoagulant, warfarin, patient knowledge.

Introduction:

Atrial fibrillation is a chronic condition that is characterized by an irregular heartbeat. This irregularity of the heart rhythm places people with atrial fibrillation at greater risk of forming blood clots and subsequently increases their risk of stroke⁽¹⁾. AF confers a 5-fold risk of stroke. Ischemic strokes in association with AF are often fatal, and those patients who survive are left more disabled by their stroke and more likely to suffer a recurrence than patients with other causes of stroke⁽²⁾.

Oral anticoagulation (OAC) significantly reduces the risk of stroke in

atrial fibrillation (AF) patients⁽³⁾. Until recently the mainstay of OAC therapy was vitamin K antagonists, most commonly with warfarin. However, warfarin requires AF patients to maintain a narrow therapeutic range (INR range 2.0 to 3.0)⁽⁴⁾. Unwanted serious complications most likely occur when patients are over-anticoagulated or underanticoagulated. So it requires frequent monitoring of patient's INR and dose adjustments to ensure minimizing the risk of thromboembolic events without increasing the risk of bleeding complications⁽⁵⁾.

Several factors contributing to fluctuation in INR and subsequently non-therapeutic treatment outcomes including interactions with other drugs, dietary intake, poor patient's compliance and deficiency in patient's knowledge⁽⁶⁾.

Studies suggest where patients have a greater knowledge of warfarin therapy, INR values are more often within target range⁽⁷⁾. Patient need information about the need for warfarin, the risks and benefits associated with OAC therapy, potential interactions with food, drugs, and alcohol, and the importance of monitoring, and control of their INR⁽⁸⁾.

Therefore, the patient's knowledge and education on warfarin therapy has an important impact on anticoagulation control and results in a more effective and stable treatment. Moreover, adherence to warfarin therapy is enhanced by knowledge and understanding of medications, its benefits and side effects^(9, 10).

Aim of study:

Assess knowledge regarding warfarin among patients with chronic atrial fibrillation

Research questions:

- 1- What is the patient's current level of knowledge about warfarin?
- 2- What are factors that correlated with the AF patient's knowledge of warfarin therapy?

Subjects & Methods

Study Design:

A descriptive correlational cross sectional research design was used in this study.

Setting:

This Study was conducted at the cardiovascular outpatient clinic in the Specialized-Medical Hospital at Mansoura University.

Subjects

A convenient sample of 104 patients with atrial fibrillation were entered in the

study. The patients were selected based on the following criteria

Inclusion criteria:

Adult patients, of both sexes, 18 years old and less than 60 years,

Had at least two ECG-documented episodes of AF,

Diagnosed with AF 6 months ago, Participants should have been taking warfarin for at least 3 months, able to communicate and willing to participate in the study.

Exclusion criteria:

Malignant tumor or other diseases at the terminal stage,

The occurrence of myocardial infarction or thromboembolic events within 3 Months.

Thyroid dysfunction, Physical or mental limitations in completing the questionnaire

Tools:

Tool 1: warfarin knowledge questionnaire:

The following tool were developed based on recent literature review and were utilized to collect data pertinent to the study and consisted of two parts (16,17,18,20,24,26,34)

Part I: Socio - demographic characteristics and medical information:

To assess sociodemographic characteristics (e.g. age, gender, marital status, educational level, Occupation, treatment system and residence) and medical information (e.g. type of AF, duration of warfarin use previous bleeding and previous stroke).

Part II: patients' warfarin knowledge scale :

This part had (24) items that cover the main topics on warfarin such as purpose of warfarin, drug interactions ,vitamin K and diet ,effect of missing dose and its management as well as when the patient should seek medical advice . All subjects need to respond "Yes," "No," to each question. A correct answer was scored = 1;

an incorrect answer was scored = 0. Scores of each item were summed up, and the total score ranged from 0 to 24. Score percentage = mean score / maximum possible score $\times 100\%$. Higher scores indicated more knowledge about AF. The level of knowledge was classified according to good, fair, and poor for overall knowledge. A score of 75% = (18-24) were classified as "Good", from 74% to 50% = (12-17) classified as "fair", and a score $< 50\%$ = (0 - 11) was classified as "poor"⁽³⁵⁾.

Methods:

1. An official permission was issued from the faculty of nursing, Mansoura University to carry out the study.
2. An official letter was issued with approval from the director of the hospital after explanation of the purpose of the study and the schedule of data collection.
3. The tool was developed by the researcher after reviewing the related literature.
4. The tool was tested for content validity by a panel of 5 experts in the field of the study (4 were nurse professors working with faculty of nursing and medical – surgical nursing and medical field and the modification was done (simplified words used to be understood by patients).
5. Tool was tested for its reliability using the test – retest measurement and Cronbach,s alpha test . (Test – retest) reliability of knowledge questionnaire is ranged from $r = 0.82 - r = 0.86$ and Cronbach,s alpha ($r. \alpha$) = 0.868 .
6. Patient’s written consent was obtained after explanation of the objective of the study and confidentiality and privacy was assured.

7. A pilot study was carried out on 10 patients to test feasibility, clarity and applicability of the tool. Accordingly modifications were done and final form of the tool was reconstructed and made ready for use.
8. Patient were selected according to inclusion criteria
9. An interview schedule was used for data collection and after the examination of the patient by the junior doctor the researcher took the patient from the clinic to the waiting room for his medications in outpatient clinic.
10. The researcher managed to interview from 3 to 5 patients daily .time taken to fill study tools ranged from 20 – 30 minutes on individual basis to be filled depending on the degree of understanding and response of the patient.
11. The researcher coded the questionnaires to assure the anonymity of the subjects. Finally, the researcher scored the responses, and compiled them for data analysis.
12. The data collection covered a period of 4 months, started from the beginning of October 2013 to the end of January 2014

Results:

The data collected were analyzed statistically and the results are categorized into 3 main parts which are: sociodemographic characteristics and medical information (table 5.1, 5.2), knowledge of patients about anticoagulation (figure 5.1, table 5.3), factors affect knowledge (table 5.4, 5.5).

Table (5.1): Distribution of study populations according to their sociodemographic characteristics (No = 104):

Items	No	%
	N = 104	100
Age group :		
18-< 30	4	3.8
30-< 40	3	2.9
40-< 50	18	17.3
50-<60	79	76
Gender :		
Male	40	38.5
Female	64	61.5
Marital status :		
Single	5	4.8
Married	83	79.8
Divorced	1	1
Widow	15	14.4
Educational level :		
Illiterate	63	60.6
Read & write	20	19.2
Secondary	18	17.3
University	3	2.9
Working status :		
Working	22	21.1
Office work	5	4.8
Manual work	17	16.3
Not working	82	78.9
Student	2	1.9
House wife	61	58.7
Others	19	18.3
Treatment system		
Governmental	104	100
Private insurance	0	0
Self pay	0	0
Residence		
Rural	79	76
Urban	25	24

Table 5.1: The age of the studied subjects ranged from 18 to less than 60 years. Most of the sample (76%) were age from 50-<60 years old, (17.3%) from 40-< 50 years old, and only (6.7%) from 18-< 40 years.

Females were more prevalent in the study sample than males, they constitute (61.5%) of the patients, while only (38.5%) were males. The majority of participants were married (79.8%). Regarding the educational level the majority of the respondents were Illiterate and only (2.9%) completed university education.

Concerning patient's occupation the study also showed that out of 104 participants only 22 (21.1%) were working. the majority of the subjects were not working (78.9%) and more than half of them were house wife (58.7%).

Regarding the residence the majority of the subjects lived in rural areas (76%) and only (24%) lived in urban areas.

Table (5.2): Health related data of the study population (No = 104):

Items	No	%
	N = 104	100
Type of AF :		
Paroxysmal	4	3.8
Persistent	17	16.3
Permanent	83	79.8
Duration of warfarin use		
<1 year	24	23.1
1-<3 year	28	26.9
3-<5 year	15	14.4
5-<10 year	22	21.2
≥ 10 years	15	14.4
Past history of hemorrhage		
Yes	24	23.1
No	80	76.9
Past history of stroke		
Yes	10	9.6
No	94	90.4

Table 5.2: show a health related data among study participants. Regarding diagnosis (79.8%) of the participants diagnosed with permanent AF, (16.3%) diagnosed with persistent AF, but just (3.8%) of participants diagnosed with paroxysmal AF. Regarding complications 23.1% of participants reported previous bleeding from warfarin and 9.6% of participants reported previous stroke events.

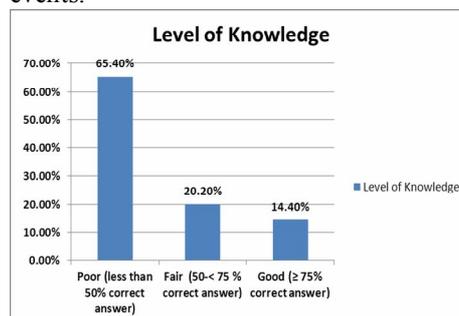


Figure (5.1): Distribution of patients on warfarin according to knowledge level. Mean total score (9.9± 6.32).

Figure 5.1: shows the percentage of knowledge level about warfarin among studied AF patients and the mean score of participants who reported correct responses to items related to warfarin knowledge. knowledge level were classified into 3 levels (poor , fair , good)

.In the studied group 65.4% had poor knowledge level and only 14.4 % had good level. The total score for healthcare knowledge about warfarin was 9.9 ± 6.32 (range 0-24). The total knowledge score was at poor level

Table (5.3): Distribution of populations with a correct response about warfarin (No =104):

Item	No	Percentage (%)
Can missing one dose of Coumadin (warfarin) alter the drug's effectiveness?	75	72.1
Can you distinguish between different strengths of Coumadin (warfarin) tablets by color?	78	75
Should warfarin/ aspirin/ other anti-platelet medication be taken for patients with AF?	100	96.2
The risks for clots formation are reduced in AF patients taking warfarin/ aspirin/ other anti-platelet medication?	64	61.5
prevention of stroke is one of the purposes of warfarin therapy	38	36.5
Bleeding may occur in AF patients taking warfarin/ aspirin/ other anti-platelet medication?	49	47.1
Chronic use of aspirin with warfarin increase risk of bleeding?	18	17.3
Sudden increases in vitamin K intake may decrease the effect of warfarin.	9	8.7
lowering your vitamin K intake could increase the effect of warfarin	9	8.7
Occasionally eating a large amount of leafy greens vegetables while taking Coumadin(warfarin) reduce the effectiveness of the Coumadin	12	11.5
Warfarin treatment should be mentioned if a doctor prescribes new medication or plans an operation	60	57.7
The INR is a test of blood clotting	97	93.3
The purposes of monitoring INR are to adjust dose of anticoagulant & prevent complications (bleeding)	47	45.2
Do you know Target INR level	23	22.1
Is it necessary to monitor INR when taking warfarin	58	55.8
Do you know your Value of current INR	18	17.3
Do you know date of next INR check	76	73.1
Each time you get your PT/INR checked should you let your DR know if you missed any dose of coumadine?	29	27.9
Foods such as (Broccoli, lettuce, watercress, bean) can affect INR level.	14	13.5
Foods rich with Vitamin K include (cabbage, spinach, peas, parsley).	10	9.6
Medications which can affect INR level include (antibiotics – herbal supplements-vitamin K, vitamin E, panadol, aspirin)?	32	30.8
signs/symptoms caused by excessive anticoagulation include		
-Nosebleeds	37	35.6
-Dark red or brown urine	38	36.5
- Excessive menstrual bleeding or bleeding	34	32.7
between		
menstrual periods		

Table (5.4): shows correlation between knowledge level and sociodemographic characteristics. There were no statistically significant differences in mean warfarin knowledge scores between married and unmarried ($X^2 = 7.469$, $P = 0.280$). The mean knowledge scores in males were significantly higher than females ($X^2 = 6.115$, $P = 0.047$). The mean warfarin knowledge scores of the subjects in the highest education group were significantly higher than those of the subjects in the lowest education group ($X^2 = 33.121$, $P \leq 0.000$). Middle age and young adults had significantly higher knowledge score than older adults ($X^2 = 10.745$, $P = 0.030$). Subjects who lived in urban areas had higher knowledge scores than those lived

in rural areas ($X^2 = 12.431$, $P \leq 0.002$). Subjects who work had higher knowledge scores than those who didn't work ($X^2 = 19.055$, $P \leq 0.000$).

Table(5.5): shows correlation between knowledge level and health related data. The mean knowledge scores of the subjects with long duration of warfarin use were significantly higher than those of the subjects with short duration of warfarin use ($X^2 = 16.029$, $P \leq 0.042$). Patients with past history of bleeding from warfarin had significantly higher knowledge scores than patients with no previous bleeding ($X^2 = 9.919$, $P \leq 0.007$). There was no significant correlation between knowledge level and type of AF or previous stroke events.

Table (5.4): Relationship between knowledge level and sociodemographic characteristics of studied populations (No = 104)

K level	Poor No (%)	Fair No (%)	Good No (%)	Significance test
social characteristics				
Sex				
Male (40)	22 (55)	8 (20)	10 (25)	$X^2 = 6.115$ $P = 0.047$
Female (64)	46 (71.9)	13 (20.3)	5 (7.8)	
Age group				
18-< 40 (7)	5 (71.4)	0 (0.0)	2 (28.6)	$X^2 = 10.745$ $P = 0.030$
40-< 50 (18)	7 (38.9)	8 (44.4)	3 (16.7)	
50-< 60 (79)	56 (70.9)	13 (16.4)	10 (12.7)	
Social status				
Single (5)	4 (80)	0 (0.0)	1 (20)	$X^2 = 7.469$ $P = 0.280$
Married (83)	53 (63.9)	19 (22.9)	11 (13.3)	
Divorced (1)	0 (0.0)	1 (100.0)	0 (0.0)	
Widow (15)	11 (73.3)	1 (6.7)	3 (20.0)	
Education				
Illiterate (63)	51 (81)	9 (14.3)	3 (4.7)	$X^2 = 33.121$ $P \leq 0.000$
Read & write(20)	9 (45.0)	7 (35.0)	4 (20.0)	
Secondary (18)	8 (44.4)	5 (27.8)	5 (27.8)	
University (3)	0 (0.0)	0 (0.0)	2 (100.0)	
Working status				
Working (21)	7 (33.3)	5 (23.8)	9 (42.9)	$X^2 = 19.055$ $P \leq 0.000$
Notworking(83)	61 (73.5)	16 (19.3)	6 (7.2)	
Residence				
Rural (79)	56 (70.9)	17 (21.5)	6 (7.6)	$X^2 = 12.431$ $P \leq 0.002$
Urban (25)	12 (48.0)	4 (20.0)	9 (36.0)	

Table (5.5): Relationship between knowledge level and health related data of studied populations (No = 104)

Level	Poor No (%)	Fair No (%)	Good No (%)	Significance test
Variables measured				
Type of AF :				
Paroxysmal (4)	2 (50)	2(50)	0 (0.0)	X ² =3.278 P 0.513
Persistent (17)	12 (70.6)	2(11.8)	3 (17.6)	
Permanent (83)	54 (65.1)	17 (20.5)	12 (14.4)	
Duration of warfarin use				
<1 year (24)	17(70.8)	4(16.7)	3(12.5)	X ² =16.029 P 0.042 MC 0.041
1-<3 year (28)	14(50.0)	11(39.3)	3(10.7)	
3-<5 year (15)	13(86.6)	1(6.7)	1(6.7)	
5-<10 year (22)	17(77.3)	2(9.1)	3(13.6)	
≥ 10 years (15)	7(46.7)	3(20.0)	5(33.3)	
Bleeding				
Yes (24)	10 (41.7)	10 (41.7)	4 (16.6)	X ² =9.919 P 0.007 MC 0.006
No (80)	58 (72.5)	11(13.75)	11(13.75)	
Stroke				
Yes (10)	6 (60)	3(30)	1(10)	X ² =0.726 P 0.696
No (94)	62(66)	18(19.1)	14(14.9)	

Discussion:

Atrial fibrillation (AF) is the most common arrhythmia in clinical practice⁽¹¹⁾. Atrial fibrillation is a major risk factor of stroke with approximately every fifth stroke is due to AF. Stroke in AF is often severe and results in long-term disability or death^(12, 13)

Stroke prevention in atrial fibrillation (AF), most commonly with warfarin, requires maintenance of a narrow therapeutic target (INR 2.0 to 3.0). Patients that spent at least 70% of their time in therapeutic range had a 79% reduced risk of stroke compared to patients with ≤30% of time in range⁽⁴⁾. This narrow therapeutic range is often difficult to achieve due to the many factors that can affect INR control such as food intake , other medications and alcohol intake⁽¹⁾.

Warfarin therapy requires frequent monitoring and dose adjustments to

maintain anticoagulation within a narrow therapeutic window. To ensure safe and effective use, it is vital that patients have a sound understanding of warfarin. Research suggests where patients have a greater knowledge of warfarin therapy, INR values are more often within the target therapeutic range (Tang et al, 2003)⁽⁷⁾. However, AF patients often exhibit limited knowledge of their condition and their anticoagulant therapy^(14, 36). Therefore this study was conducted to determine AF patient’s knowledge about using (warfarin) in Egypt. Discussion of results will be presented in the following sequence: knowledge about warfarin, factors affecting knowledge level.

The findings of this study showed that the total mean score of warfarin knowledge among the subjects were at the poor level. In the present study about two thirds of the studied subjects had poor

level and only less than one quarter had good knowledge about warfarin.

This result agrees with a study conducted at Malaysia and Hong Kong by (Tang et al, 2003; Matalqah et al, 2013)^(7,16) which reported that mean total score were at poor level and only less than quarter of patients had good knowledge level about warfarin. Other studies revealed that between 50-80% of patients having poor knowledge about important basic aspects of warfarin^(14,10). In contrast (Baker et al, 2011)⁽¹⁹⁾ found that about three quarters of respondents had good knowledge about warfarin.

In the present study less than two thirds of participants identified the general purpose of the medication as "it reduce risk for clots" but only one third could report that reducing the risk for stroke was the specific reason they were treated with warfarin.

The same finding of poor knowledge that warfarin reduce risk for stroke was reported in other studies conducted by (Tang et al, 2003 (40%); St-Louis & Robichaud- Ekstrand 2003 (38%))^(7, 18). In contrast (Parker et al, 2007)⁽²¹⁾ reported that 83% of participants were aware that too little Coumadin could cause stroke.

Three quarters of the study respondents can distinguish between different dosage forms by color.

This is in accordance with a previous survey that took part by (Yassien et al, 2012) in Jordan⁽²²⁾. In contrast this findings is in contradiction to another study conducted at Malaysia by (YAHAYA et al, 2009)⁽²³⁾ who indicated that approximately two-thirds of respondents had poor knowledge of different tablet dosage forms and their strength.

Regarding warfarin complications the present study reported that less than half of participants know that warfarin may cause bleeding.

This study finding is in agreement with results of other studies (Lane et al, 2006); Nadar et al, 2003)^(14,15) which reported that majority of patients were not aware of bleeding risks associated with warfarin. In contrast another study conducted in Finland by (Koponen et al, 2007)⁽²⁴⁾ reported that more than four fifths know that warfarin increase risk of bleeding.

This study shows also that majority of patients lack knowledge about warning signs of excess anticoagulation and interactions between warfarin and over the counter preparations and interactions between warfarin and VIT K products.

This is in accordance with results reported by others (Lip et al, 2002; St-Louis & Robichaud- Ekstrand, 2003; McCabe et al, 2008;; Yassien et al, 2012; YAHAYA et al, 2009)^(20,18,17,22,23).

Most participants know that INR is a test for blood clotting but less than half reported that they know purpose of monitoring INR and only just over the half reported that it is necessary to monitor INR.

On the same line lower results reported in other studies conducted in China by (Xu et al, 2010) and Jordan by (Yassien et al, 2012) which report that 22% & less than 30% of participants know purpose of monitoring INR^(26,22). In contrast higher results were reported in another study conducted by (Koponen et al, 2007)⁽²⁴⁾ in which 77% of participants know purpose of INR monitoring.

In addition also the present study reported that majority of patients lack knowledge about target INR, current value of INR.

This is in accordance with another study conducted at China by (Xu et al, 2010)⁽²⁶⁾ reported that only about half of participants know target INR. Another study also conducted at Hong Kong by (Lee et al, 2012)⁽²⁷⁾ reported that only 36% know their INR level. In contrast another study conducted by (McCabe et al, 2008)

⁽¹⁷⁾ in USA reported that majority of patients know target and current value of INR.

Regarding sex of studied subjects and warfarin knowledge level, it was observed that males had significantly higher knowledge scores than females.

This finding can be explained by the fact that illiteracy increase among females than males and is contributed to the culture of most people living in rural areas in Egypt and their preference for young females to get married in young age and be available for the family and this was reflected in the study results by the higher percentage of illiteracy among female subjects. Egypt's total number of illiterates aged 10 years or more has exceeded 16 million in 2012, with approximately 10.3 million of them being females, a recent study conducted by the Central Agency for Public Mobilisation and Statistics (CAPMAS, 2012)⁽²⁸⁾. This is in accordance with a study conducted at Finland by (Koponen et al, 2007)⁽²⁴⁾ which reported that females were least knowledgeable about AF and anticoagulation than males. In contrast other studies conducted at Malaysia and China by (YAHAYA et al, 2009; Matalqah et al, 2013; Bounda et al, 2013)^(23,16,30) reported that no difference was found for warfarin knowledge scores between males and that of females.

Regardless of social state the study findings revealed no statistically significant differences in mean warfarin knowledge scores between married and unmarried.

This result is in accordance with other studies conducted by (Eugene & Bourne, 2013; Xu et al, 2010)^(31,26) which revealed no significant statistical difference among the knowledge level of respondents based on marital status.

As regard age and its relation to knowledge of the studied subject it was found that the younger the age of the studied subjects the more knowledge he or

she had and the difference was statistically significant. This may be related to that the capacity to understand and communicate is good among young adult and middle age groups but reduced in older groups due to cognitive impairment.

This result is in accordance with other studies conducted at Malaysia and China and Canada by (YAHAYA et al, 2009; Bounda et al, 2013; Rahmani et al, 2013)^(23,30,34) which reported that younger patients had higher warfarin knowledge scores than elderly. In contrast (Zungu et al, 2009)⁽³³⁾ revealed no significant statistical difference among the knowledge level of respondents on hypertension based on age.

As for education the subjects who had higher level of education reported more knowledge about warfarin compared to those with low educational level and the difference was statistically significant. This could be explained by the fact that respondents who had at least primary educational status have higher chance of exposure to different information education material (I.E.C) like leaflet, manual and that they have no barriers in communicating with the health care team beside their potential to grasp information's already communicated (Naglaa & Mohamed 2010)⁽²⁵⁾.

This result is in agreement with other studies conducted at USA and Malaysia by (McCabe et al, 2008; YAHAYA et al, 2009)^(17,23) reported higher warfarin knowledge scores among patients with higher education. In addition other two studies conducted at Egypt by (Elashry, 2010) and (Hassan, 2009)^(29,32) which reported that the more educated the study subjects the more he/she had good knowledge.

Furthermore regarding to occupation the results of this study revealed that patients who work reported higher knowledge about atrial fibrillation in contrast to housewives and the difference was statistically significant.

In accordance other studies conducted by (Bounda et al, 2013 ;Matalqah et al, 2013) ^(30,16) among patients on warfarin , reported significant correlation between occupation and knowledge. In contrast another study conducted at Egypt by (Hassan , 2009) ⁽³²⁾ among diabetics reported no significant relation between knowledge level and occupation.

As for residence results of this study revealed that patients who lived in urban areas had higher knowledge scores than those lived in rural areas and the difference was statistically significant. In contrast another study conducted at Egypt by (Hassan , 2009) ⁽³²⁾ among diabetics reported no significant relation between knowledge level and residence.

As regard to the relation between knowledge of the studied subject and duration of warfarin use it was found that patients who had longer duration of warfarin use had greater knowledge.

This result is congruent with a study conducted at Malaysia and hongkong by (Matalqah et al, 2013; Tang et al, 2003) ^(16,7) which reported that longer duration of warfarin use is associated with higher knowledge scores. In contrast another study conducted at Finland by (Smith et al, 2010) ⁽⁸⁾ reported that no correlation was found between duration of therapy and knowledge about warfarin.

As regard to relation between previous history of bleeding and warfarin knowledge level it was found that Patients with past history of bleeding from warfarin had significantly higher knowledge scores than patients with no previous bleeding. In contrast another study conducted at Canada by (Rahmani et al, 2013) ⁽³⁴⁾ reported that no relation was found between warfarin knowledge level and bleeding events.

As for previous thrombosis events this study revealed that no relation was found between knowledge score and previous stroke events. This result is in congruent

with other study conducted at Canada by (Rahmani et al, 2013) ⁽³⁴⁾ which reported that no association was found between oral anticoagulant knowledge and previous thrombosis events.

The lack of knowledge and understanding of warfarin and INR test demonstrated by the patients in the present study at baseline may reflect the paucity of information and explanation given to the patient by their physician and other health professionals, due to the time constraints of busy outpatient clinics and the dearth of available information. Warfarin patients should be provided with better warfarin counseling to increase and enhance their warfarin and INR knowledge and enhance INR control. Being better educated about their condition and treatment may improve clinic attendance, drug compliance and possibly lead to patients using the consultation time for questions, explanations and clarification of any concerns they may have.

Conclusion:

Based on the finding of the present study, it can be concluded that about two thirds of participants had poor knowledge about warfarin .good knowledge was found only in less than one quarter of participants. The level of knowledge was found to be good in males than in females, in the young age groups than the old age group, in those with higher level of education than those with lower level of education and in patients with longer duration of warfarin use. more informational support may be needed for women ,old age patients, illiterate patients and those newly prescribed warfarin.

Recommendation

Based on the results of the present study the following recommendations are suggested:-

- Organizing patient's centered workshops to teach about warfarin and to enhance patient's motivation to play an active role in their treatment.

- Both literate and illiterate people tailored I.E.C materials on warfarin treatment and life style modification for AF patient and should be developed and disseminated during patients waiting time in outpatient clinic.
- Designing a training program for outpatient nurses about atrial fibrillation and its management, warfarin monitoring, and proper ways to provide health education and appropriate counseling for atrial fibrillation patients in order to improve knowledge and self management.
- Establish Health education clinic under supervision of faculty of nursing staff and in cooperation with medical and nursing staff in the hospital to give periodic health education for cardiac patients and their families, receive patient's calls for their queries between follow up visits, follow-up patients through telephone calls to further assess knowledge, reinforce education, and provide counseling for lifestyle modification activities

For further research:

- Replication of the study using a larger number of sample and various settings in Egypt with the inclusion of control group to examine the effectiveness of educational program on warfarin patient's knowledge and INR control.

Conflict of interest:

The authors declare that they have no conflict of interests.

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