Assiut Scientific Nursing Journal
http://asnj.journals.ekb.eg http://www.arabimpactfactor.com
DOI:10.21608/asnj.2025.383497.2078 http://olddrji.lbp.world/indexedJournals.aspx
https://vlibrary.emro.who.int/journals/assiut-scientific-nursing-journal

Effect of Nursing Educational Program on Outcomes of Patients with Atrial Fibrillation

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Abstract:
Background: Atrial fibrillation is the most prevalent ongoing heart rhythm disorder, impacting heart function, overall performance, and quality of life. Effective management is crucial to prevent adverse outcomes. **Aim:** Evaluate the effect of nursing educational program on outcomes of patients with atrial fibrillation. **Design:** A quasi-experimental (pre-posttest nonequivalent control group design) was used. **Sample**: A purposive sample of sixty adult male & female patients, diagnosed with atrial fibrillation over six consecutive months. Patients were randomly assigned to two equal groups, (30 patients each: study and control). **Setting:** It was carried out at Assiut University Hospital's Cardiovascular Medicine department and outpatient clinics. **Tools**: **Tool (I):** Patients' assessment sheet, **Tool (II):** Atrial fibrillation Symptoms Severity and Burden Questionnaire and **Tool (III):** Atrial Fibrillation Effect on Quality-of-Life questionnaire. **Results:** There were statistically significant differences between the study and control groups in total mean knowledge (11.07±1.62 vs. 6.67±2.09) and quality of life scores (68.9±5.25 vs. 56.14±5.85) following the implementation of the nursing educational program, with a p.value < 0.001*. Also, there was a significant reduction in total mean scores of Atrial fibrillation symptoms severity and burden among the study group as it decreased from (21.6±4.78, 19.07±5.53) preprogram to (13.47±3.37, 8.13±4.13) post program. **Conclusion:** The nursing educational program positively impacted the knowledge, quality of life, and severity & burden of symptoms among patients in the study group at the three-month follow-up, in comparison to the control group. **Recommendations**: Incorporating nursing educational program alongside routine hospital care is essential for effectively managing patients with atrial fibrillation.

Keywords: Atrial fibrillation, Nursing education, Outcomes & Program.

Introduction:
Atrial fibrillation (AF) is the most prevalent chronic cardiac arrhythmia, marked by tachyarrhythmia and often linked to structural cardiac issues and existing comorbidities. Atrial fibrillation is very common, with a lifetime risk of approximately 1 in 3 to 5 people after the age of 45. From 2010 to 2019, the global prevalence of atrial fibrillation significantly increased from 33.5 million to 59 million individuals affected by the condition **(Linz et al., 2024).**

Atrial fibrillation can be classified as paroxysmal (lasting less than 7 days) or persistent (lasting more than 7 days). Risk factors for atrial fibrillation include older age, hypertension, existing heart and lung conditions, congenital heart defects, and elevated alcohol intake. The vast variety of causes and symptoms of atrial fibrillation make it difficult to diagnose patients. As a result, they may miss out on necessary treatments and risk developing serious complications like stroke, bleeding, and uncontrolled arrhythmias, which can lead to readmissions and create social and economic burdens **(Linz et al., 2021)**.

While AF is rarely life-threatening in itself, the distress triggered by its symptoms can be intense and significantly diminish quality of life (QoL). This decline can be attributed to various factors, including common complaints related to arrhythmia, such as palpitations, chest pain, dizziness, and symptoms similar to heart failure. Underlying heart disease can cause symptoms like weakness, lightheadedness, and shortness of breath. Additionally, anxiety and depression can negatively affect individuals' reports of the severity of their atrial fibrillation symptoms. Furthermore, the effects of treating atrial fibrillation such as medication side effects, procedures, and especially hospitalizations can adversely affect quality of life **(Camm et al., 2022).**

Nurse-directed education for patients with atrial fibrillation (AF) plays a crucial role in improving patient outcomes by enhancing self-management, adherence to treatment, and overall quality of life. A well-structured educational program empowers patients by providing them with essential knowledge about the pathophysiology of AF, the significance of anticoagulation therapy, the risks of stroke, and the importance of regular monitoring **(Yu et al., 2024)**.

Key components of patients' education includes individualized patient assessments, clear explanations of the disease process, guidance on managing symptoms, strategies for preventing complications, and fostering effective communication between healthcare providers and patients. Furthermore, emphasize lifestyle changes, such as maintaining a healthy diet, exercise, and stress management, which can contribute to better management of AF **(Trohman et al., 2023).**

Nurses are crucial in identifying and managing atrial fibrillation by controlling heart rate and rhythm, providing continuous heart monitoring, regularly checking the patient's anticoagulation status, managing risk factors, and promoting lifestyle changes. Additionally, it is important to explain the procedure and reassure the patient to alleviate hemodynamic complications, as well as to position them carefully to prevent worsening of their condition. Lastly, a strong knowledge base is essential for enhancing patient outcomes through education that encourages self-management **(Alkhaqani, 2022).**

Significance of the study:

Atrial fibrillation is showing an increasing global incidence and prevalence, with estimates suggesting it affects as many as 37.57 million people in the general population **Lippi et al., (2021). According to Assiut University record**s, through the year 2023 to 2024, about 270 cases were admitted with atrial fibrillation at cardiovascular medicine department. Patients with atrial fibrillation have been noted to experience a significantly reduced quality of life related to health, as the symptoms and characteristics of the condition create both physical and mental stress, hindering their daily activities and social interactions **Rush et al., (2023)**. Therefore, it is crucial to develop a nursing educational program aimed at helping these patient groups manage this chronic condition, reduce the severity during active phases, sustain remission, enhance their understanding of the disease and its management, and ultimately improve their quality of life.

Aims of the study:

General objective

This study aimed to evaluate the effect of nursing educational program on outcomes of patients with atrial fibrillation.

Specific objectives

1. Assess Knowledge, Symptoms Severity & Burden and quality of life for patients with atrial fibrillation.
2. Designing and applying nursing educational program for patients with atrial fibrillation.
3. Evaluate the effect of nursing educational program on outcomes of patients with atrial fibrillation.

Hypotheses:

H1: Patients who receive a nursing educational program alongside standard hospital care are expected to have a significantly higher mean knowledge score compared to those who only receive standard hospital care.

H2: The disease severity in patients who receive nursing educational program in addition to the routine hospital care would be significantly decreased than those patients who receive routine hospital care only.

H3: Patients who receive a nursing educational program alongside standard hospital care are expected to have a significantly higher mean quality of life score compared to those who only receive standard hospital care

Operational definitions:

- **Nursing educational program:** It is a series of planned, interactive, and evidence-based sessions, aimed at improving patient understanding of their health condition, treatment options, and self-care strategies.
- **Patient's outcomes:** These are the results which would be measured pre and post-intervention; patients' knowledge, disease severity and quality of life.

Patients and Method:

Research design:

A quasi-experimental design (pre-posttest nonequivalent control group) was used to accomplish the study's objectives. The quasi-experimental research design entails manipulating the independent variable to assess its impact on the dependent variable. The pre-test and post-test outcomes are used to determine the effectiveness of the proposed intervention measures in the study **(Hudson et al., 2019).**

Setting:

The study took place in the Cardiovascular Medicine department at Assiut University Heart Hospital, part of Assiut University Hospital. Located on the second and third floors, the department has a capacity of 40 beds and provides diagnosis, treatment, and follow-up care for various cardiovascular problems faced by patients in the Upper Egypt region.

Sample:

From the time of admission until the three-month follow-up period, a purposive sample of sixty adult patients with atrial fibrillation, ages 20 to 65, were included in the study. Patients were randomly divided into two groups by flipping a coin [tails = control group (30 patients), heads= study group (30 patients)].

While the control group received standard hospital care, the study group participated in a nursing educational program. Patients who agreed to participate in the study, able to communicate, and didn't have any mental or psychological problems were included in the current study while patients with other types of arrhythmia were excluded.

Sample size:

G power analysis to estimate the sample size was performed based on the result of previous study. Assuming power of 0.80%, type I error 0.05%, type II error 0.20 with confidence interval (CI) 95%. A total sample size of 60 participants was required.

Instruments for data collection:

Three instruments were utilized to gather the required data for this study.

Tool (I): patients' assessment sheet: The researchers developed it after reviewing recent relevant literature and studies to gather demographic and medical information and to evaluate patients' knowledge about atrial fibrillation.

Part (1): Patients' demographic data: Such as age, gender, marital status, occupation, educational level and residence.

Part (2): Patients' medical data: This part assessed the patients' clinical data, including their medication, chronic disease status, duration of illness, family history, and type of atrial fibrillation.

Part (3): Jessa Atrial Fibrillation Knowledge Questionnaire (JAKQ)

Jessa Atrial Fibrillation Knowledge Questionnaire was developed by **Desteghe et al., (2016)** to measure the knowledge of patients regarding their disease and treatment. The 16-question JAKQ includes three questions on vitamin K antagonists (VKAs), five questions about oral anticoagulant treatment (OAC), and eight questions about atrial fibrillation in general. Only the first eight JAKQ questions were to be answered by patients without an OAC indication. Only multiple-choice questions with one right answer, two distractions, and the option to "I do not know" are included in the JAKQ. Correct answers are worth one point toward the final score, while incorrect and "I do not know" responses are worth zero. The total score on the JAKQ was calculated by dividing it by the number of questions answered, producing a percentage. JAKQ's test-retest reliability value was 0.902, and its Cronbach's α coefficient ranged from 0.616 to 0.637. It was measured two times; one time before applying nursing educational program and 3 months after applying intervention.

Tool (II): Atrial fibrillation Symptoms Severity and Burden Questionnaire (AFSs):

Atrial fibrillation Symptoms Severity and Burden Questionnaire was developed by **Koci et al., (2014),** Eight questions were included in order to gauge how the patient was affected by their symptoms. AFS scores range from 0 to 40 for each question, which offers four possible answers and is rated on a 5-point Likert-modified scale. Patients were prospectively categorized into four AFS classes based on an incremental sum score: Class I (asymptomatic) with 0 points, Class II (mild) with 1-10 points, Class III (moderate) with 11-20 points, and Class IV (severe) with more than 20 points. Atrial Fibrillation Burden (AFB) was evaluated using six questions focused on objective indicators of the disease and healthcare utilization. A specific set of questions regarding the frequency and duration of episodes was used for scoring, focusing solely on these two variables. Patients were classified into four AFB classes (A-Minimal = 0 points, B-mild =1-10 points, C-moderate =11-20 points and D-severe = >20 points). The internal consistency of the AFS variables was satisfactory, indicated by a Cronbach's alpha of 0.82. It was measured before and 3 months after applying nursing educational program.

Tool (III): Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire:

Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire was developed by **Spertus et al., (2011**), along with a summary score that encompasses the first three dimensions, the AFEQT comprised 20 items that assess four aspects of AF-related quality of life: symptoms (4 items), daily activities (8 items), treatment concerns (6 items), and treatment satisfaction (2 items). Patients were asked to describe how AF influenced their health status in the last four weeks. This questionnaire integrated symptoms, functional status, and quality of life into one measure and was shown to be reliable and responsive to clinical changes. A seven-point Likert scale was used to display the response options. Each domain's raw scores are converted to a scale of 0 to 100, where a score of 0 denotes the most severe symptoms or disability and a score of 100 denotes no limitations or disability. The Cronbach's alpha value was recorded at 0.91, and the item-total correlation values for the scale and subscales ranged from 0.36 to 0.91. It was measured 2 times before and after 3 months of applying nursing educational program.

Method:

The study was conducted through the following:

Field work (procedure):

Once the head manager of the cardiovascular department approved the study, the researchers began collecting data. Data were collected from May, 2024 to November, 2024. The study was carried out in four phases: Preparatory, implementation, and evaluation.

Preparatory phase

It focused on developing various data collection instruments following a review of the relevant. The

instructional booklet and educational sessions were designed and written in a simple Arabic language to meet patient's needs and their different levels of understanding. Each patient in the study group received a copy of educational program handout.

Tools validity and reliability:

Three experts in Medical-Surgical Nursing and two cardiovascular medicine professionals from Assiut University evaluated the content validity of the tools, assessing their clarity, relevance, comprehensiveness, understanding, and applicability. Feedback was also gathered on the layout, format, and sequence of the questions, and all their recommendations were considered. The consistency of the tool was confirmed by the Cronbach's alpha coefficient, indicating its reliability. The reliability of Jessa Atrial Fibrillation Knowledge Questionnaire was 0.902, the reliability score of Atrial Fibrillation Symptoms Severity and Burden Questionnaire was 0.82, and the overall score of Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire was 0.91.

Pilot study:

A pilot study was conducted with 6 patients, representing 10% of the study subjects, to evaluate the applicability, feasibility, practicality of the tools, and the time required to complete them. Data from the pilot study were analyzed, and no changes were made. The subjects involved in the pilot were excluded from the overall study sample and replaced with others.

Ethical consideration:

The study was affirmed by the Research Ethics Committee of Faculty of Nursing, Assiut university with approved number (IRB:1120240782). Also, an official agreement was obtained from the head of the Cardiovascular medicine department to conduct the study. Each patient gave their written consent to take part in the study. There was no risk to patients from the research procedures. Anonymity, confidentiality, voluntary involvement, and the freedom to leave the study at any time were all stressed by the researchers. Privacy of study participants was taken into account when gathering data. All research ethics principles had been fulfilled according to the **world medical association declaration of Helsinki, (1997).**

Implementation phase:

In this phase, each patient who met the inclusion criteria was interviewed individually to clarify the nature and purpose of the study, and consent forms were collected from those who agreed to participate. Subsequently, patients were randomly assigned to two equal groups: the control group, which received standard hospital care, and the study group, which received a nursing educational program in addition to routine hospital care. Demographic & clinical data, Jessa Atrial Fibrillation Knowledge Questionnaire, Atrial fibrillation Symptoms Severity and Burden Questionnaire, and Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire were completed during the first interview to gather baseline inforation.

The researchers were visiting Cardiovascular Medicine department around five days/week for six months from 9.00 am to 2.00 pm. During this phase, the control group received the routine hospital care which included continuous monitoring of heart rate, rhythm (ECG) and blood pressure. Obtaining blood tests including electrolyte levels, kidney function and coagulation profile. Symptoms assessment (shortness of breath, palpations, dizziness, chest pain, or fatigue) as well as correction of electrolyte imbalance. Monitor intake and output and administering medication for rate control or rhythm control and therapies for stroke prevention.

The study group was given the nursing educational program, the researchers explained its purpose, content, and how to go through it. The program was explained to patient in 4 sessions (one theoretical and three practical). The researchers provided the intervention individually to each patient of the study group in a private education room. Three sessions were conducted during patients' hospitalization and the other session was during the weekly follow up pf patients on the outpatient clinics as the following.

The 1st session was aimed to give patients basic information about atrial fibrillation and the purpose of nursing educational program as anatomical overview and physiology of the heart, definition, causes, risk factors, symptoms, diagnosis, consequences and treatment of atrial fibrillation. Encourage patients to ask questions and confirm patients understood what they were told.

The 2nd session included empowering patients with knowledge and skills about the importance of control of atrial fibrillation manifestations to improve quality of life. Teach patients how to measure their pulse by locating a heartbeat on their wrist and counting the beats for one minute while watching the clock. Demonstrate the recommended physical activity which included regular moderate-intensity aerobic exercise as walking for 30 minutes two/three times per week. Instructing patients about making healthy food choices to keep blood pressure normal by limiting sodium and salt intake, incorporating potassium-rich foods, consuming at least five servings of fruits and vegetables, and opting for low-fat or fat-free dairy products to provide calcium and potassium.

The 3rd session was aimed to enforce patients with knowledge to adhere to medications. instruct patients about precaution when taking blood thinner to avoid blood clots by avoiding cuts, using an electric razor,

exercising caution with knives, wearing gloves while gardening, brushing teeth gently with a soft toothbrush, and flossing carefully, Consulting doctor about activities that may pose a risk of injury and find out how to prevent falls both at home and in the hospital. Instruct patients about dose, route, reason and possible side effect of each medication and do not discontinue any medications without consulting the doctor first. Encourage patients to contact their doctor if they experience a return of atrial fibrillation symptoms, such as an irregular or rapid heartbeat, heart palpitations, dizziness or faintness, fatigue or weakness, shortness of breath, or chest pain and pressure.

The 4th session helped patients to develop effective stress management techniques by incorporating relaxation methods, such as deep breathing, progressive muscle relaxation. and mindfulness practices. Also, stress on the importance of quitting of smoking, measures to prevent relapses of trigger factors and planning follow-up care.

Each session lasted approximately 30 to 45 minutes and began with a summary of the content covered in the previous session. Furthermore, participants in the study group was followed up by the researchers during the week through phone call to ensure that they are adhering to the nursing educational program. The handout was distributed to all patients included in nursing educational program.

Evaluation phase:

Every participant in the study and control group was evaluated after 3 months during the follow up clinic visits by giving them the posttest (tool I part 3) for half an hour. Then, Atrial fibrillation Symptoms Severity and Burden Questionnaire, and Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire (tool II & III) was completed again by the researchers in 10 - 20 minutes to evaluate patients' prognosis.

Statistical analysis:

The data was analyzed statistically using Microsoft Excel and version 26 of the Statistical Package for the Social Sciences (SPSS). For quantitative data, the arithmetic mean (X) and standard deviation (SD) were used, whereas for categorical data, frequencies and percentages were used as descriptive statistics. The chi square test (X2) was used to compare qualitative variables. The student t-test was used to evaluate the group differences during the two visits. A p-value of ≤ 0.05 was regarded as statistically significant, while a p-value of < 0.001 was considered highly significant. In addition, the r-test was employed to assess the correlation between patients' quality of life, knowledge levels, and the severity and burden of AF symptoms among both the study and control groups before and after the implementation of the nursing educational program.

Results:

Table (1): Demographic data of the study and control groups (n= 60)

Demographic data	Study group (n=30)		Control group (n=30)		X^2/t-test	P. value
	N	%	N	%		
Age groups						
30 < 40	4	13.3	5	16.7		
40 <50	15	50.0	13	50.0	0.67	0.878
50 < 60	8	26.7	10	26.7		
60-56	3	10.0	2	6.7		
Mean±SD	**48.80±8.22(29-62)**		**47.27±8.48(32-65)**		t: 0.66	0.480
Gender						
Male	19	63.3	19	63.3	0.07	0.788
Female	11	36.7	11	36.7		
Marital status						
Single	1	3.3	3	10.0		
Married	19	63.3	18	60.0	2.42	0.488
Divorced	4	13.3	6	20.0		
Widowed	6	20.0	3	10.0		
Educational level						
Illiterate	5	16.7	6	20.0		
Primary education	7	23.3	8	26.7	0.39	0.942
Secondary education	15	50.0	14	46.7		
University or higher education	3	10.0	2	6.7		
Occupation						
Working	20	66.6	18	60.0	1.15	0.284
Not working	10	33.3	12	40.0		
Residence						
Urban	17	56.7	16	53.3	0.07	0.795
Rural	13	43.3	14	46.7		

** Significant at p ≤ 0.05* *** Significant at p≤0.01*

Table (2): Medical data of the study and control groups (n = 60)

Medical data	Study group (n=30)		Control group (n=30)		X^2/t-test	P. value
	N	%	N	%		
Type of atrial fibrillation						
Paroxysmal	21	70.0	22	73.3		
Persistent	7	23.3	6	20.0	0.10	0.951
Permanent	2	6.7	2	6.7		
Chronic diseases						
Heart failure	4	13.3	8	26.7		
Hypertension	21	70.0	15	50.0	2.68	0.444
Diabetes mellitus	2	6.7	3	10.0		
Vascular disease	3	10.0	4	13.3		
Medication						
Antiarrythmics	7	23.3	5	15.7		
Antihypertensives	16	53.3	13	43.3		
Antilipidemics	4	13.3	5	16.7	1.55	0.816
Warfarin	4	13.3	5	16.7		
New oral anticoagulants	5	16.7	8	26.7		
Family history of atrial fibrillation						
No	14	46.7	13	43.3		
Yes	16	53.3	17	56.7	0.07	0.795
Duration of illness (years)						
≤ one year	12	40.0	11	36.7	0.01	1.000
> one year	18	60.0	19	63.3		

** Significant at p ≤ 0.05* *** Significant at p≤0.01*

Table (3): Comparison between the pre and post nursing educational program mean scores of Jessa Atrial Fibrillation Knowledge Questionnaire among study and control groups (n = 60)

Jessa Atrial Fibrillation Knowledge Questionnaire (JAKQ)	Study group (n = 30)	Control group (n = 30)	t-test	P.value
	Mean±SD(range)	Mean±SD(range)		
Pre nursing educational program	4.93±0.87 (3-8)	4.67±1.35 (3-8)	0.911	0.366
3 months post- nursing educational program	11.07±1.62 (9-15)	6.67±2.09 (3-11)	9.11	0.001**

** Significant at p ≤ 0.05* *** Significant at p≤0.01*

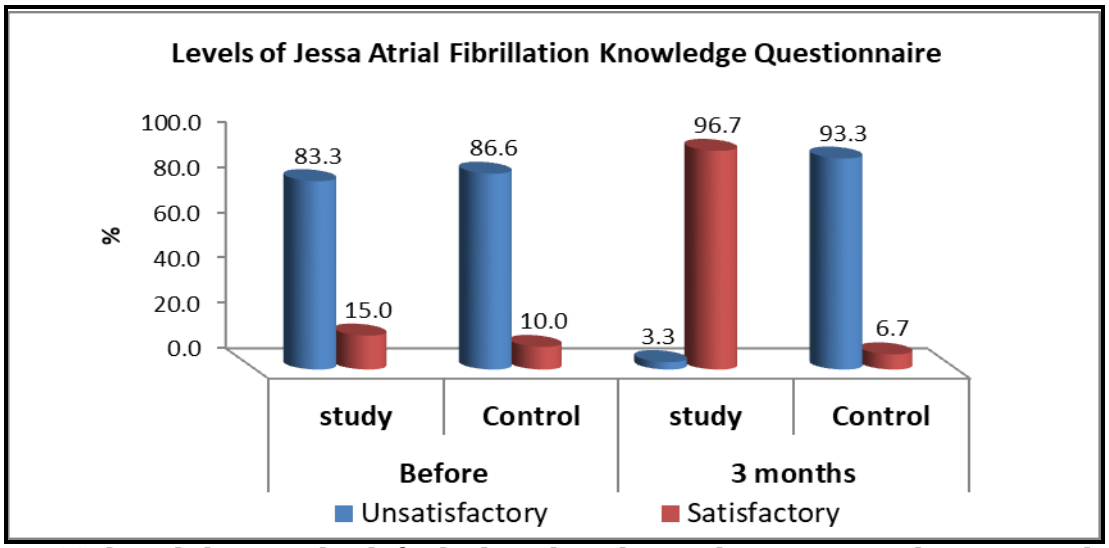

Figure (1): knowledge score levels for both study and control groups pre and post 3 months of nursing educational program (n=60)

Table (4): Comparison between the pre and post nursing educational program mean scores of AF Symptoms Severity and Burden Questionnaire among study and control groups (n = 60)

AF Symptoms Severity and Burden Questionnaire	Pre nursing educational program		t-test	P.value	3 months post- nursing educational program		t-test	P.value
	Study group (n = 30)	Control group (n = 30)			Study group (n = 30)	Control group (n = 30)		
	Mean±SD	Mean±SD			Mean±SD	Mean±SD		
AF Symptoms (AFS)	21.6±4.78	22.57±5.56	0.72	0.473	13.47±3.37	18.13±4.13	4.79	0.001**
AF Burden (AFB)	19.07±5.53	17.77±6.1	0.86	0.391	8.13±4.13	15.73±6.45	5.43	0.001**

** Significant at p ≤ 0.05* *** Significant at p≤0.01*

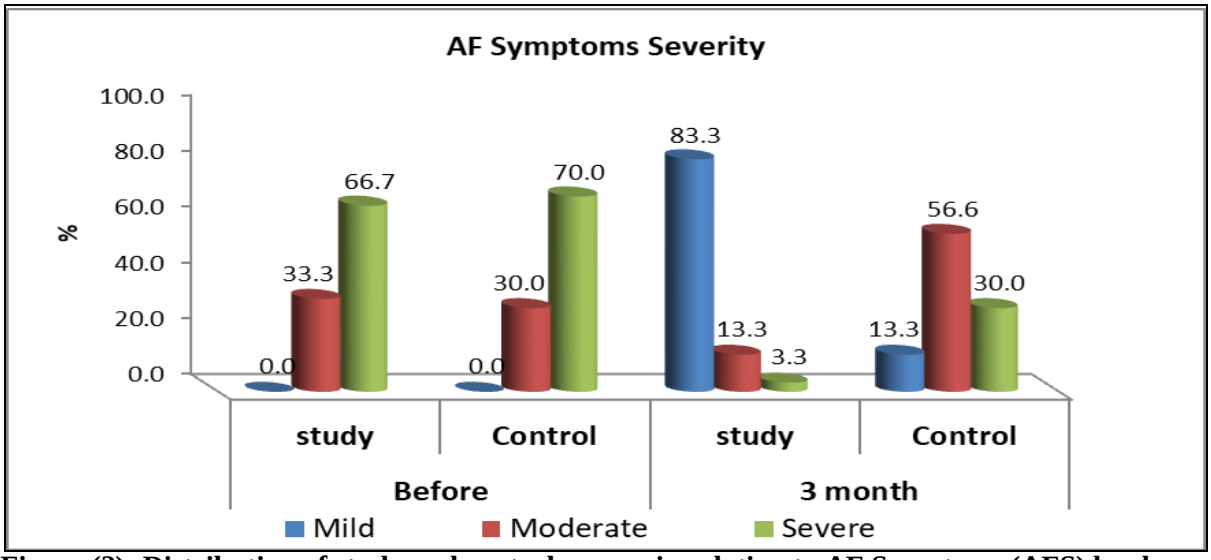

Figure (2): Distribution of study and control groups in relation to AF Symptoms (AFS) levels pre and post nursing educational program (n=60)

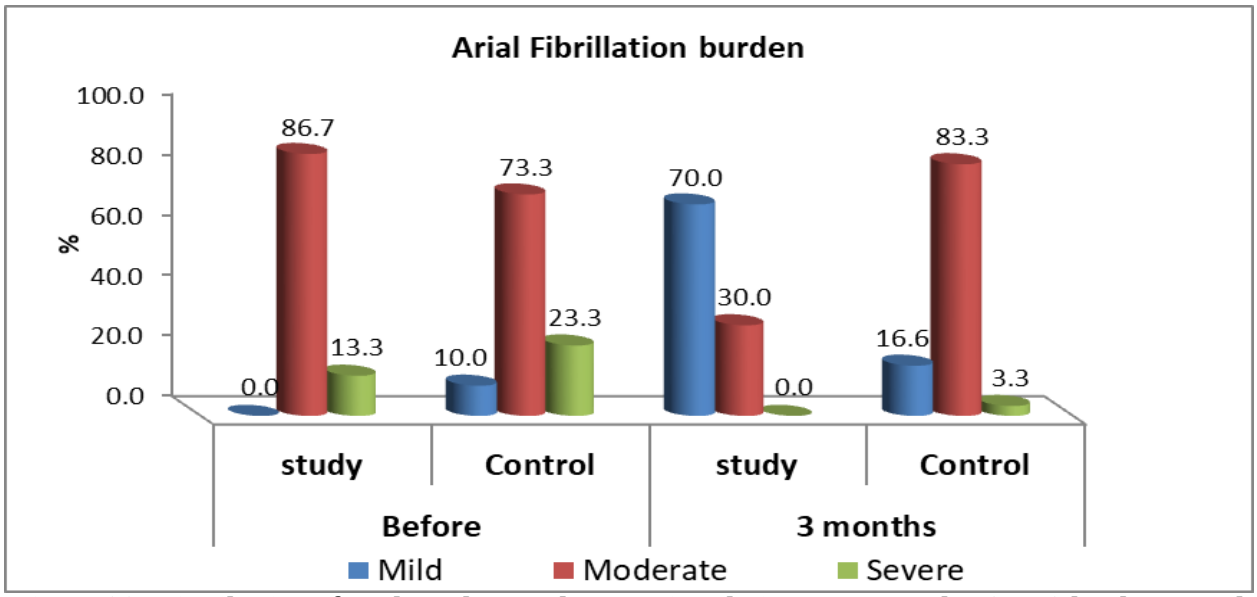

Figure (3): Distribution of study and control groups in relation to AF Burden (AFB) levels pre and post nursing educational program (n=60)

Table (5): Total and subtotal mean scores of AF Effect on Quality-of-Life questionnaire among study and control groups pre and 3 months of nursing educational program (n = 60)

AF Effect on Quality-of-Life questionnaire	Pre nursing educational program		t-test	P. value	3 months post- nursing educational program		t-test	P.value
	Study group (n = 30)	Control group (n = 30)			Study group (n = 30)	Control group (n = 30)		
	Mean±SD	Mean±SD			Mean±SD	Mean±SD		
Symptoms	58.93±8.79	54.64±10.61	1.71	0.093	73.22±8.55	64.76±14.37	4.41	<0.001**
Daily activities	39.33±4.6	40.75±11.28	0.64	0.525	66.32±11.04	51.16±12.23	5.04	<0.001**
Treatment concern	42.15±7.08	45.08±7.64	1.54	0.128	59.36±8.34	51.67±8.4	3.56	<0.001**
Treatment satisfaction	37.63±11.25	42.62±13.98	1.52	0.133	67.86±10.51	52.75±13.05	5.92	<0.001**
Total	44.16±3.79	45.23±6.75	0.76	0.453	68.9±5.25	56.14±5.85	8.89	<0.001**

** Significant at p ≤ 0.05* *** Significant at p≤0.01*

Table (6): Correlation co-efficient between total scores of AF Effect on Quality-of-Life questionnaire and AF Symptoms Severity and Burden Questionnaire of the studied patients pre and 3 months post nursing educational program (n = 60)

Correlations	Total AF Effect on Quality-of-Life score							
	Study group (n = 30)				Control group (n = 30)			
	Pre nursing educational program		3 months post-nursing educational program		Pre nursing educational program		3 months post-nursing educational program	
	r	P	r	P	r	P	r	P
Total AF Symptoms Severity and Burden scores	-0.185	0.019	-0.139*	0.032	-0.168	0.376	-0.173	0.361
Total AF Symptoms Severity and Burden scores	-0.114*	0.050	-0.374*	0.042	-0.103	0.586	-0.273	0.145

Table (7): Correlation co-efficient between total scores of AF Effect on Quality-of-Life questionnaire and Jessa Atrial Fibrillation Knowledge Questionnaire for study and control groups before and after 3 months of nursing educational program (n = 60)

Variables	Total AF Effect on Quality-of-Life score			
	Study group (n = 30)		Control group (n = 30)	
	r	P	r	P
Pre nursing educational program Total Jessa Atrial Fibrillation Knowledge scores	0.485*	0.037	0.185	0.327
3 months post- nursing educational program Total Jessa Atrial Fibrillation Knowledge scores	0.610**	0.001	0.582*	0.036

Table (1): Reveals the highest percentage of patients in the study and control groups were aged between 40 and 50 years, with mean ages of 48.80±8.22 years and 47.27±8.48 years, respectively. and 63.3 of them were males. Of the patients, 63.3% of the study group and 60.0% of the control group were married. In terms of educational level, 50.0% of the study group and 46.7 of the control group had secondary education. Finally, regarding occupation, (66.6% and 60.0%) of both groups respectively were employees and 56.7% of the study group and 53.3% of the control group were living in urban.

Table (2): Shows that the majority of patients in both groups (70.0% and 73.3%) respectively were diagnosed as paroxysmal atrial fibrillation. In terms of chronic diseases, 70.0% of the study group had hypertension compared to 50.0% the control group. 53.3% and 43.3% of the study and control groups were taking antihypertensive drugs, respectively. 53.3% of the study group had positive family history compared to 56.7% of the control group. Regarding duration of illness, the majority of patients in both groups diagnosed with disease since more than one year (60.0% and 63.3%), respectively.

Table (3): Clarifies that there was no statistically significant difference in relation to Jessa Atrial Fibrillation Knowledge Questionnaire between the study and control groups pre nursing educational program (t= 0.911, P = 0.366). while, a statistically significant difference was found between both groups at 3-month follow up (t= 9.11, P = 0.001**)

Figure (1): Illustrates that (83.3% and 86.6. %) respectively of studied patients had unsatisfactory level of knowledge before nursing educational program with no statistically significant difference (P.value = 0.556). While at 3-month follow up; the control group still had unsatisfactory level of knowledge and about 96.7% of the study group had satisfactory level of knowledge with statistically significant difference (P=0.001**).

Table (4): Indicates that there was no statistically significant difference regarding total mean score of AF Symptoms Severity and Burden Questionnaire between the study and control groups pre nursing educational program (t= 0.72, P = 0.473), (t= 0.86, P = 0.391), respectively. while, a statistically significant difference was found between both groups at 3-month follow up (t= 4.79, P = 0.001**), (t= 5.43, P = 0.001**).

Figure (2): Represents that (66.7% and 70.0%) respectively of both study and control groups had severe degree of symptoms before intervention with no statistically significant difference (P.value = 0.781). While 83.3% of the study group compared to 13.3 of the control group had mild degree of symptoms at 3- month follow up with statistically significant difference (P.value = 0.019*).

Figure (3): Demonstrates that (86.7% and 70.0%) of study and control groups, respectively had moderate AF burden before intervention with no statistically significant difference (P.value = 0.187). While (70.0% versus 16.6%) respectively of study and control groups had mild AF burden 3 months after nursing educational program with statistically significant difference (P.value = 0.045*).

Table (5): Clarifies that there was a significant improvement among patients in the study group in relation to items of AF Effect on Quality-of-Life questionnaire with the mean (44.16±3.79, 68.9±5.25) respectively pre and 3 months post nursing educational program compared to the control group, minimal significant improvement was found between pre and 3-month follow (45.23±6.75, 56.14±5.85) respectively.

Table (6): Exhibits that a significant negative correlation between AF Effect on Quality-of-Life and AF Symptoms Severity and Burden questionnaire pre nursing educational program and after 3 months among study group patients**.**

Table (7): Demonstrate that a significant positive correlation between AF Effect on Quality-of-Life and Jessa Atrial Fibrillation Knowledge among study group patients pre nursing educational program and after 3 months.

Discussion:

Almost five million people worldwide receive a diagnosis of AF each year, making it the most prevalent arrhythmia **(Kirchhof et al., 2016).** As the world's population ages, the prevalence of AF is expected to rise, impacting 6–12 million Americans by 2050 and 17.9 million Europeans by 2060 **(Lippi et al., 2021)**. Heart failure, elevated mortality rates, and high rates of stroke events are noted in AF patients. The goals of treatment are to improve quality of life and lessen or completely eradicate AF symptoms (**Kirchhof et al., 2016).**

Patients with atrial fibrillation (AF) often experience significant anxiety and need a thorough explanation of their condition and treatment options to ease their worries and enhance adherence **(Holmlund et al., 2024)**. Therefore, gathering the required information is essential for this process. So this study aimed at studying the effect of nursing educational program on outcomes of patients with atrial fibrillation.

Regarding demographic characteristics; the results of the current study revealed that, the highest percentage of patients in both the study and control groups, their ages ranged from forty to fifty years old and the highest percent of them are males and married. In accordance with the study of **Rakhshan et al., (2019) & Seo & Lee, (2023)** in which the majority of participants were men, however the average age of the subjects was over fifty years old, while in disagreement with **Fuenzalida et al., (2017)** in which the majority of the sample in their study was females. In terms of educational attainment, around half of the study group and near half of the control group had secondary education and more than half of both groups were employees, disagreeing with **Rakhshan et al., (2019)** who demonstrated that the sample in both studies lived in an urban area, and that over half of the control group and more than half of the intervention group were illiterate, with roughly one-third of them being retired.

Regarding medical data; the majority of patients in both groups were diagnosed as paroxysmal atrial fibrillation which was in line with the study of **Freeman et al., (2015)** in which the majority of the study had paroxysmal atrial fibrillation. In contrast, **Seo & Lee's., (2023)** study found that permanent atrial fibrillation was the type of atrial fibrillation in their study.

Concerning chronic diseases, the majority of the study group and half of the control group had

hypertension, aligning with the findings of **Seo & Lee, (2023).** Additionally, the majority of patients in **Freeman et al., (2015)**'s study reported having hypertension. This suggested that older age, being male, and having hypertension may contribute to a higher prevalence of atrial fibrillation. Also more than half of the study and control groups had positive family history of AF.

In relation to duration of illness, most patients in both groups had been diagnosed with the condition for more than a year, in accordance with **Seo & Lee (2023),** who found that most participants had atrial fibrillation for more than a year to less than five years. There was no statistically significant difference between the two groups regarding all medical data, these results in agreement with **Zhang, & Guo, (2023)** who found that, there were no significant differences for the demographics and baselines of the patients.

Regarding atrial fibrillation knowledge assessment; the results of this study underscore significant improvements in the knowledge of patients regarding atrial fibrillation (AF) following a targeted intervention, highlighting the importance of educational strategies in chronic disease management. Prior to the intervention, both groups exhibited a low baseline knowledge of AF, which is in line with previous research showing that patients have a general lack of knowledge about AF and how to treat it **(January et al., 2019)**. This lack of knowledge can have harmful effects on patient self-management and outcomes, emphasizing the need for effective educational interventions.

At the three-month follow-up, the plain contrast in knowledge levels between the study and control groups points to the successful implementation of the intervention. The control group maintaining an unsatisfactory knowledge level indicates that traditional care methods may not be enough in improving patient understanding of their condition. This supported with the findings by **McCabe et al. (2016)**, who proposed that many patients do not receive enough information regarding their cardiac disease, which may worsen health risks and have an adverse effect on treatment adherence.

In contrast, the study group that had focused educational interventions showed a notable improvement in their understanding of AF. This aligns with the core principles of health education literature, which emphasize that organized educational efforts can successfully increase patient understanding and equip them with the resources necessary to engage actively in their own healthcare **(Engelhard et al., 2019)**. In point of view, the statistically significant difference between the two groups indicates that the educational intervention was not only effective but also critically necessary in fostering a culture of knowledge that can lead to improved health outcomes. Moreover, the increase in knowledge among the study group may lead to better self-management practices.

Regarding comparison of AF Symptoms Severity and Burden Questionnaire between Study and Control Groups Pre and Post Intervention; the findings from the present study suggest that there was no statistically significant difference in the total mean score of the Atrial Fibrillation (AF) Symptoms Severity and Burden Questionnaire between the study and control groups prior to the nursing educational program. This indicates that both groups had comparable levels of AF symptoms and perceived burden at the baseline, emphasizing the necessity of establishing a uniform starting point for evaluating the effects of the intervention. While at three-month follow-up assessment, a statistically significant difference was observed between the study and control groups, indicating that the intervention had a meaningful impact on reducing the severity and burden of AF symptoms in the study group. This outcome is consistent with **(Goren et al., 2019; Krittayaphong et al., 2020)**, who clarified that the subsequent significant reduction in AF symptom severity and perceived burden in the study group at the three-month follow-up suggests that the nursing educational program effectively enhanced patients' understanding and self-management of their condition, leading to symptom improvement.

From point of view, educational interventions have been shown to improve health outcomes in AF patients by increasing disease knowledge, promoting lifestyle modifications, and encouraging adherence to prescribed therapies.

Also Wilson et al. (2024) stated that the significant difference at follow-up emphasizes that such programs can produce clinically meaningful benefits, aligning with evidence that patient-centered education improves health outcomes and reduces symptom severity in chronic cardiovascular conditions. This indicates that the educational intervention effectively reduced the severity and burden of AF symptoms, demonstrating that patient education can improve symptom management and quality of life in AF patients.

Regarding atrial fibrillation symptom severity; the present study represented that most of both study and control groups had severe degree of symptoms before intervention with no statistically significant difference, while the majority of the study group had mild degree of symptoms at three month follow up with statistically significant difference compared to the control group, this result in consistent with **Abed et al., (2013)** who stated that a notable reduction in

the severity of atrial fibrillation symptoms reported by patients was observed in the intervention group compared to the control group

Regarding atrial fibrillation Burden; the current study demonstrated that the majority of the study and control groups had moderate AF burden before intervention with no statistically significant difference, suggesting that both groups were similarly affected and that their baseline characteristics did not differ significantly concerning AF burden. This finding is consistent with the existing literature that suggests that higher AF burden correlates with increased risk of adverse events **(Kottkamp & Hindricks, 2022)**.

While the maximum percent of the study group had mild AF burden three months after intervention compared to the control group with statistically significant difference. The statistically significant difference compared to the control group indicates that the intervention not only had an effect on AF burden but that this effect was measurable and likely clinically relevant. Prior research has shown that anticoagulant medication and lifestyle modifications are effective management techniques that can greatly lower the burden of AF. **(January et al., 2014; Verma et al., 2015).** From researchers' view, a noticeable decrease from moderate to mild AF burden emphasizes the need for continued exploration of effective management strategies that can lead to improved outcomes for individuals living with atrial fibrillation.

Regarding atrial fibrillation effect on quality of life; the results of the study clarified that there was a significant improvement among patients in the study group in relation to items of AF Effect on Quality-of-Life pre and three months post nursing educational program compared to the control group, minimal significant improvement was found between pre and three month follow. This inconsistent with a study by **Joensen et al. (2019)** who stated that patients' quality of life (QoL) scores as determined by the Atrial Fibrillation Effect on Quality of Life (AFEQT) questionnaire significantly improved after taking part in a structured education and lifestyle intervention.

Regarding Correlation between AF Effect on Quality-of-Life and AF Symptoms Severity and Burden; the current study exhibited that a significant negative correlation between AF Effect on Quality-of-Life and AF Symptoms Severity and Burden pre intervention and after three months among study group patients that is in line with research showing a negative relationship between QoL and the intensity of physiological symptoms, such as palpitations, fatigue, and shortness of breath **(Proietti, et al., 2017)**. A study by **Freeman et al., (2015)** found that an inverse correlation between the EHRA AF symptom severity classification system and quality of life as measured by the AFEQT. They also mentioned a connection between quality of life and the severity of AF symptoms. From the researchers' view, addressing symptom burden through education and management strategies is essential for improving patient outcomes. As reduced quality of life was linked to an increased risk of hospitalization and a slightly elevated risk of major bleeding. and the burden of these symptoms can be considerable, affecting both physical and psychological health.

Regarding Correlation between AF Effect on Quality-of-Life and Jessa Atrial Fibrillation Knowledge; the study's results demonstrating a significant positive correlation between AF knowledge and quality of life pre intervention and after three months. These results supported by study conducted by **Desteghe et al. (2019)**, who discovered that patients who had organized education on managing their AF had a higher chance of reporting gains in their quality of life scores than patients who didn't. The study's education program contained details on the causes of AF, available treatments, and lifestyle changes that directly encouraged patients to engage in their own care.

Moreover, **Rosenstrøm et al. (2023)** investigated the impact of patient education in a randomized controlled trial and discovered that patients who got more information about managing AF reported higher quality of life and fewer hospitalization rates. From researchers' view, when patients are well-informed, they are more likely to adhere to prescribed therapies and make necessary lifestyle changes to manage AF.

Conclusion:

The highest percentage of patients in the study group had satisfactory overall knowledge score regarding AF and its management, moderate degree of symptoms and high overall mean scores of quality of life compared to the control group at 3-month follow up post implementation of nursing educational program. Also, results highlighted a negative significant correlation between patients' quality of life and symptoms severity and burden of atrial fibrillation. These results supported all the proposed hypotheses.

Recommendations:

Recommendations for patients

1. All patients diagnosed with AF should receive illustrated colored booklets containing items of educational nursing program and these booklets should be kept available in Cardiovascular Medicine department and outpatient clinics

2. Establish peer-led support groups where patients can share experiences and coping strategies related to living with atrial fibrillation.

Recommendations for nurses

1. Nurses should attend regular in-service training courses and workshops focusing on management of patients with atrial fibrillation. This will improve their knowledge, practice, and attitude ultimately leading to better patients' outcomes.
2. Incorporating nursing educational program alongside routine hospital care is essential for effectively managing patients with atrial fibrillation.

Recommendation for scientific research

1. Incorporating digital platforms (e.g., mobile apps, online resources) to provide patients with easy access to educational materials and tools for self-management of atrial fibrillation.
2. Conduct longitudinal studies to assess the long-term effects of nursing educational programs on atrial fibrillation outcomes.
3. Replication of the current study with a larger probability sample to ensure generalizability and broader implementation of the developed educational nursing program.

Acknowledgements:

The researchers would like to express their heartfelt gratitude to all the patients who participated in this study for their cooperation throughout the research. Furthermore, the researchers wish to convey their sincere thanks and appreciation to the medical team at the Cardiovascular Medicine department and outpatient clinics at Assiut University Hospital for their dedication and support in making the data collection process for this study possible.

Funding

No funding.

Conflicts of interest

The authors declare no conflict of interest to declare for publication.

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