EDUCATIONAL NEEDS OF INDIVIDUALS

WITH ATRIAL FIBRILLATION

by

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ABSTRACT

Atrial fibrillation (AF) is the most common heart rhythm abnormality in the United States. AF can lead to serious consequences like stroke, heart failure, and even death. Literature has shown that individuals diagnosed with atrial fibrillation have a less than desirable knowledge level about their condition. The literature has also shown that factors, such as age and level of education, may contribute to AF knowledge levels. The focus of this study was to identify AF patients' knowledge of the AF disease process, symptoms, and treatment options. The research question addressed in this study was: What are the educational needs of persons with AF? This exploratory study used a descriptive, cross sectional design to identify knowledge levels of persons with AF. Data was collected in an outpatient cardiology setting. There were twenty-seven participants. The AF Knowledge Scale was used to measure level of knowledge about the disease, recognition of symptoms, and understanding of therapy used in AF. Demographic variables were also collected and analyzed. The overall mean score for the AF Knowledge scale was 52.5%. When separated into categories, data analysis showed that participants had the highest mean score percentage in the AF attitude category (64.81%), followed by AF in general (60.49%), AF treatment (46.91%), and AF symptoms (41.98%). Demographic characteristics analyzed showed that age, length of diagnosis and AF pattern are important characteristics to consider when providing individuals education about their AF. The results of this study corroborate findings in the literature. The findings suggest that further research needs to be conducted on ways to evaluate individual knowledge about AF and development of educational interventions for AF.

CHAPTER 1

INTRODUCTION

Atrial fibrillation (AF) is the most common heart rhythm abnormality diagnosed

in the United States (US). It occurs when the atria (top chambers) of the heart do not

have an organized electrical activity and do not communicate well with the heart's

ventricles (lower chambers) (American Heart Association [AHA], 2012a, 2012b). This

causes a disorganized or "fibrillation" like pattern that can lead to consequences that

affect the individual and the economy alike. Common causes of AF include cardiac

disorders, thyroid disorders, alcohol use and certain medications (US National Library of

Medicine, 2012). According to the AHA, approximately 2.7 million Americans are

affected by AF (AHA, 2012b). AF can lead to strokes, complications in other chronic

diseases such as heart failure, and increases the risk of death. The cost of AF is estimated

to be between $6.4 billion (National Heart Lung Blood Institute [NHLBI], 2010) and $26

billion annually when you include costs that are associated with AF (Kim, Johnston,

Bong-Chul, Dalal, & Schulman, 2011).

Several different treatment options exist for management of AF. Management

may include medication to restore and maintain sinus rhythm, medications to obtain rate

control, and anticoagulants. With proper management of AF the risk of stroke and other

heart related problems can be significantly decreased (American College of Cardiology

[ACC], 2013). The management of AF can be very individualized (Shea & Sears, 2008)

and for greater success the nurse should work with the individual to help them understand

treatment options. It is important that persons with diagnosed AF be educated about their condition in order to improve self-management behaviors, improve health outcomes and decrease the economic burden.

The AHA reported from the "Out of Sync" survey, conducted by Sanofi-Aventis, that only 33% of persons with AF considered AF to be a serious condition. Less than one-half of people with diagnosed AF understood that they have an increased risk for strokes or other heart related problems (Sanofi-Aventis, 2009). It is important to understand the information persons with AF need from the nurse and other health care providers in order for persons to take a more active role in their care and achieve higher levels of health. In order to do this, the nurse must first identify the person's knowledge of AF. Identifying knowledge level is a critical first step in improving health outcomes. Once a person's knowledge level is determined, his/her educational needs related to AF can also be identified, and resources can be developed to meet those needs (McCabe, Schad, Hampton, & Holland, 2008).

<div align="center">Background and Significance</div>

Researchers have shown that persons with AF have a less than desirable level of knowledge about AF (Koponen et al., 2007; Lane, Ponsford, Shelley, Sirpal & Lip, 2006; McCabe et al., 2008; Xu et al., 2010). With an increase in incidence of AF and the impact that AF has on health outcome and the economy, it is important for individuals to receive appropriate education regarding their condition. When persons' knowledge deficits and educational needs are identified, resources can be tailored to bridge the

knowledge gap. Specific interventions can be used to improve knowledge, self-management, and potentially improve health outcomes.

Incidence of Atrial Fibrillation

The NHLBI Division of Cardiovascular Diseases Strategic Plan lists stopping the epidemic of AF and its associated morbidity as a goal (NHLBI, 2008). As the population ages, the incidence of AF rises. AF is noted to be most prevalent in persons aged 65 or greater. In fact, the NHLBI estimated that 6% of the population in the US, over the age of 65, has AF (NHLBI, 2010). The prevalence is even greater in the patient population greater than age 85 (Naccarelli, Varker, Lin, & Schulman, 2009). According to the NHLBI the prevalence of AF is expected to double current prevalence by the year 2020. The study by Naccarelli et al. (2009) estimated that the prevalence is expected to be over 7.5 million by the year 2050. With the increase in the number of persons affected by AF each year, it is likely that the cost of treating AF will also rise.

Impact of Atrial Fibrillation on
Other Chronic Health Conditions

If uncontrolled, AF can lead to stroke, heart failure and death. When the atria (top chambers) of the heart do not contract effectively, blood pools in those chambers, increasing the risk of thrombus (clot) formation. When a thrombus is formed, it can be pumped into the blood stream and travel to the brain, leading to ischemic stroke (AHA, 2012a). With AF, an individual's risk of ischemic stroke increases by 4-6% on average. This percentage also increases as the person ages. It is thought that 20% of all ischemic

strokes are caused by AF, with 25% of ischemic strokes in persons over the age of 80 caused by AF (NHLBI, 2010; National Institute of Neurological Disorders and Stroke [NINDS], 2011).

AF can also lead to heart failure. Fast heart rates reduce stroke volume and the heart's ability to efficiently pump blood to the body resulting congestion from a backup of fluid in the pulmonary veins and the lungs. A reduction in delivery of oxygen rich blood to the tissues can lead to symptoms of congestive heart failure; including decreased energy, shortness of breath, and fluid retention causing swelling and weight gain (AHA, 2012c). Persons with AF were more than four times more likely to have congestive heart failure and valvular heart disease than persons without AF (Naccarelli et al., 2009).

Economic Burden of Atrial Fibrillation

The economic burden of AF in the US is significant. It is estimated that AF costs Americans about $6.4 billion each year (NHLBI, 2010) and, as the prevalence grows, so likely will the cost. Coyne et al. (2006) estimated that $2.93 billion (44%) were spent on direct medical costs of persons with a primary diagnosis of AF in an inpatient setting; and $1.95 billion (29%) was spent annually when AF was listed as a comorbidity to a primary diagnosis such as congestive heart failure or coronary artery disease. Costs for outpatient and pharmacologic treatment of AF can reach $1.76 billion (27%) annually. Kim, Hussein, Kreilick, and Battleman (2009) reported that, over one year's time, the average cost for inpatient care of a person with a primary diagnosis of AF was over $11,000. Outpatient costs for one person with primary AF, over one year's time, was slightly less

than $3,000.00. Persons with a diagnosis of secondary AF had a total cost of nearly

$6,500.00 dollars annually, with inpatient costs being $5,000.00. Not only does this

information show that the economic burden of AF is high, but it also shows that a large

portion of health care costs related to AF are related to inpatient costs. Therefore, a plan

should be implemented to keep persons with AF from being admitted to the hospital.

<u>Purpose</u>

The purpose of this study was to identify AF patients' knowledge of the AF

disease process, symptoms, and treatment options. The research question addressed in

this study was: What are the educational needs of persons with AF?

<u>Theoretical Framework</u>

The theoretical framework used for this study was the Uncertainty in Illness

Theory, (Mishel, 1988). Uncertainty is defined as "the inability to determine the meaning

of illness-related events, occurring when the decision maker is unable to assign definite

value to objects or events, or is unable to predict outcomes accurately" (Mishel, 1988, p.

225). According to Mishel (1988) uncertainty occurs in four different ways: "ambiguity

concerning the state of the illness, complexity regarding treatment and system of care,

lack of information about the diagnosis and seriousness of illness and unpredictability of

the course of the disease and prognosis" (p. 225). Uncertainty may increase stress,

emotional distress, mood disturbance, and anxiety while decreasing quality of life and

psychosocial adjustment to illness .When familiarity with symptoms and event

expectations increase, information is more easily processed, leading to decreased levels of uncertainty. Social support and information from health care providers about an illness that promotes the interpretation of events may indirectly decrease levels of uncertainty (Mishel, 1984, 1988). The theory has been used by nurses to understand uncertainty as a stressor in relation to illness. The theory has partially explained individuals' ability to cope with illness and helped guide health care providers to establish interventions that encourage optimal health (Braden, Mishel, & Longman, 1998; Kang, Daly, & Kim, 2004; Mishel, et al., 2002).

Within the framework of the Uncertainty in Illness Theory, the experience of acute and chronically ill individuals is described. By gaining a better understanding of the individual's experience and knowledge of AF, appropriate interventions can be established to facilitate behaviors that will help individuals self-manage their AF. Investigators (Mishel, 1997; Braden, Mishel, & Longman, 1998; and Kazer, Bailey, Sanda, Colberg, & Kelly, 2011) have proposed that education-related interventions designed to improve self-management are important in managing uncertainty. This study sought to identify gaps in knowledge of individuals with AF in order to provide guidance for educational interventions.

Assumptions

The assumptions on which this study was based included:

1. Individuals with newly diagnosed AF need education about their condition.

2. The nurse must identify AF knowledge levels in order to provide sufficient care and education.

3. Research on the educational needs of persons with newly diagnosed AF will facilitate improved educational practices.

4. Education can improve health outcomes in individuals with newly diagnosed AF.

5. Individualized patient education can improve persons understanding of AF and reduce uncertaintythus improving self-management behaviors and decreasing hospital admissions and complications associated with AF.

Definitions

- Atrial fibrillation is defined as "a problem with the rate or rhythm of the heart beat" that "occurs if rapid, disorganized electrical signals cause the heart's two upper chambers—called the atria to contract very fast and irregularly" (NHLBI), 2011, para 1 and 2).

- Congestive heart failure is "a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill or eject blood" (Hunt et al., 2009, p. e7).

- Education is defined as "the action or process of formal instruction" (Merriam-Webster Online Dictionary, 2013).

- Ischemic stroke occurs as a "result of an obstruction within a blood vessel supplying blood to the brain" (AHA, 2013).

- Knowledge is defined as "the fact or condition of having information or of being learned" (Merriam-Webster Online Dictionary, 2013).

- Normal sinus rhythm (NSR) is the normal electrical pattern that creates a regular heart rate and rhythm. In NSR the average heart rate is 60-100 beats per minute (bpm) (NHLBI, 2011).

- Patient education is "information and instruction" that is "clinically acceptable in terms of proven benefit for the patient" and is "tolerated and accepted by the patient" (Hendriks, Crijns, Tieleman, & Vrijhoef, 2013, p. 1).

- Uncertainty is defined as "the inability to determine the meaning of illness-related events, occurring when the decision maker is unable to assign definite value to objects or events, or is unable to predict outcomes accurately" (Mishel, 1988, p. 225).

CHAPTER 2

REVIEW OF LITERATURE

The literature review examined previous research conducted on the topic of AF and the knowledge that individuals with AF have about their condition. Chapter 2 will contain a summary of the literature regarding the electrical conduction system of the heart, AF management, treatment guidelines; individuals' knowledge and perception of AF; knowledge of anticoagulation use for AF;   and patient education related to AF.

Electrical Conduction System of the Heart

The electrical conduction system of the heart is the controlling factor of heart rate and rhythm. Each heart beat has its own electrical conduction, starting at the top of the heart and traveling through the bottom of the heart. When the electrical current moves through the heart it causes contraction of the heart muscle which pumps the blood through the heart and into circulation (NHLBI, 2011).

The sinaoatrial (SA) node, located in the right atrium starts the electrical signal. The electrical signal travels down through the right and left atrial creating a contraction, pushing the blood forward to the ventricles. The signal moves to the atrial-ventricular (AV) node, slows down to allow the ventricles to fill with blood, and then moves to the ventricles causing them to contract. This contraction pumps blood into the circulatory system. The process repeats itself 60-100 times per minute in normal sinus rhythm (NHLBI, 2011).

AF does not have the same electrical pattern that normal sinus rhythm does. Instead of the conduction starting in the SA node it starts in the atria or in the pulmonary veins. The electrical signal does not travel in a regular pattern; it travels in a disorganized and chaotic way. This leads to the fibrillation pattern in the atria and the uncoordinated contraction of the heart muscle, often leading to rapid heart rates and ineffective pumping of the heart muscle (NHLBI, 2011).

<p style="text-align:center;">Potential Etiologies of AF</p>

AF has several potential etiologies. Etiologies can be cardiac related, non-cardiac related or can be from the physiologic process of aging. Cardiac causes that have the potential to lead to AF include: coronary artery disease, myocardial infarction, cardiac surgery (including coronary artery bypass grafting and valve replacement surgeries), heart failure, valvular heart disease, and pericarditis (inflammation of the sac that surrounds the heart) or other chest trauma. Non-cardiac etiologies that could lead to AF include alcohol use (more notably with binge drinking), hyperthyroidism, pulmonary disease, obstructive sleep apnea and certain medications (theophylline and β- adrenergic agonists). AF will often times resolve after the underlying disease process is treated. (Bashore, Granger, & Hranitzky, 2012; US National Library of Medicine, 2012; Wilson, Shannon, & Shields, 2011).

AF Management

AF can be classified in three different ways: paroxysmal, persistent, and permanent (AHA, 2012c). Classification aids providers in determining a management strategy. Paroxysmal AF spontaneously terminates on its own. People with paroxysmal AF have intermittent irregular heart rhythms that may occur frequently or infrequently. Persistent AF lasts longer than seven days. It does not terminate spontaneously and typically requires some form of therapy to induce conversion to sinus (normal) rhythm (American College of Cardiology Foundation [ACCF] & AHA, 2011, AHA 2012c). Permanent AF lasts indefinitely. Conversion to sinus rhythm has typically failed with medications and with cardioversion (AHA, 2012c).

The treatment guidelines for AF are complex, but the AHA (2011) provides a simplified explanation of the treatment of AF. Guidelines address three components: stroke prevention, anticoagulation, and rate and rhythm control.

Stroke Prevention and Anticoagulation

To evaluate the risk for stroke the health care provider should consider the individual's CHADS2 score. CHADS is a mnemonic for the major stroke risk factors in people with AF and stands for congestive heart failure (C), hypertension (H), 75 years of age or greater (A), diabetes (D), and history of stroke (S). Based on the CHADS2 score the provider will determine the risk of stroke and the type of anticoagulation necessary. Lifestyle factors, such as diet and exercise, also should be addressed in order to prevent stroke (AHA, 2011).

Depending on the determination of risk factors, aspirin or a stronger type of anticoagulation, such as warfarin or dabigatran (Wilson, Shannon, & Shields, 2011) should be used to prevent thrombus leading to ischemic stroke. Individuals prescribed anticoagulants require education on signs and symptoms of bleeding, bleeding risk associated with medical procedures, diet and lifestyle changes, medication interactions, and the importance of follow-up with their health care provider (AHA, 2012d). The type of anticoagulation used will play a role in determining the type of follow-up needed (AHA, 2011).

Rate and Rhythm Control

Multiple treatment options are available to keep the heart rate under control and in a normal sinus rhythm. Options include medications, pharmacologic cardioversion, electrical cardioversion and catheter ablation (combined with other therapy).

The management of recurrent, persistent AF is based on individual symptoms. Treatment of individuals with minimal symptoms typically includes anticoagulation and rate control. Individuals with disabling symptoms are first started on medications for rate control and anticoagulation. When rate control treatment is unsuccessful, antiarrhythmic drug therapy and electrical cardioversion are considered. Electrical cardioversion is a procedure where the individual receives an electric shock on the outside of the chest in an effort to put the heart back into a normal sinus rhythm. The procedure is done with mild anesthesia (AHA, 2012e). When electrical cardioversion fails in a person with severe symptoms, a catheter ablation could be considered in addition to other therapy (ACCF &

AHA, 2011). Catheter ablation is the intentional scarring of the area of the heart causing the irregular heart rhythm. A catheter is directed into the heart, typically from blood vessels in the leg or arm, and a laser is used to create scar tissue in the areas of the heart that have malfunctioning electrical activity. When it is successful the electrical activity returns to normal sinus rhythm. Specific rate control and antiarrhythmic strategies will be discussed below.

Rate Control of AF: Heart rate control in AF is considered <110 bpm at rest in persons with persistent AF with stable left ventricular function and "no or acceptable symptoms related to the arrhythmia" (ACCF & AHA, 2011, p. 30). Agents considered, based on individual circumstances, include beta blockers, calcium channel blockers, or antiarrythmics. Management with beta blockers could include metoprolol, propranolol or similar agents (Wilson et al., 2011). Common calcium channel blockers include diltiazem and verapamil (Wilson et al., 2011). Antiarrythmics agents used for rate control could include amiodarone or digoxin (ACCF & AHA, 2011; Wilson, et al., 2011). Rate control management for persons with AF is individualized; different pharmacologic agents can be trialed and combined to achieve positive outcomes. Management strategy is likely to vary slightly for each individual.

Rhythm Control of AF: Pharmacologic therapy is used for pharmacological cardioversion and for maintenance therapy. Pharmacological cardioversion is the use of medications to try to restore a normal sinus rhythm. Agents with proven efficacy used for pharmacological cardioversion include, dofetilide, flecainide, ibutilide, propafenone,

and amiodarone (Wilson et al., 2011). Pharmacologic therapy for maintenance of sinus rhythm includes the choice of different agents, including: dronedarone, flecainide, propafenone, sotalol, amiodarone, and dofetilide (Wilson et al., 2011). Generally, individuals with no heart disease could be managed with any of these agents. Individuals with AF and underlying hypertension with substantial left ventricular hypertrophy (LVH) need to be managed with amiodarone. Individuals with AF and concurrent heart failure should be managed with amiodarone or dofetilide (Wilson et al., 2011). Individuals with AF and coronary artery disease should be treated with dofetilide, dronedarone, sotalol, or amiodarone (ACCF & AHA, 2011; Wilson et al., 2011).

Generally, when pharmacologic therapy fails, an electrical cardioversion is performed.   Anticoagulation and antiarrhythmic therapy is typically continued after electrical cardioversion. If sinus rhythm is still not restored or maintained, the individual may be considered for catheter ablation of AF, depending on the symptoms profile (ACCF & AHA, 2011). The individual's risk factors, heart structure and comorbidities are considered when determining the use of catheter ablation. Antiarrythmics are often used for a short time after the catheter ablation to ensure a normal heart rhythm (AHA, 2012e).

Sometimes the episode of AF is paroxysmal and treatment is generally limited to monitoring, without control of heart rate and rhythm. These individuals will need close follow-up to ensure prevention of complications like heart failure and stroke (AHA, 2011).

Analysis of Research Studies

A review of the literature related to the educational needs of persons with AF,

revealed a limited number of published studies on the topic. In six studies that were

reviewed, data showed that persons with AF have a limited knowledge level of their AF

(Hendriks et al., 2013; Koponen, et al., 2007; Lane et al., 2006; McCabe et al., 2008;

McCabe, Schumacher, & Barnason, 2011; Xu, et al. 2010). A generalized review of

research design, sample selection and size, instruments and results are provided in Table

1. A discussion of the concepts identified in each of the research studies follows Table 1.

Table 1: Summary of Atrial Fibrillation Knowledge Assessment Research Articles

Summary of Atrial Fibrillation Knowledge Assessment Research Articles				
Author/ Year	Research design/Methods	Sample selection and size	Instruments used	Results
Hendriks et al./2013	Research used to develop and evaluate AF knowledge scale (tool) used to measure knowledge of person with AF. Control and intervention group used to evaluate improvement in knowledge after one year.	Persons referred for AF (documented by ECG) to specialized AF clinic and volunteer. N=210 (completing baseline and follow-up)	AF knowledge scale. Questions based on general AF, symptoms of AF, and treatment of AF. Further reliability and validity should be considered.	Overall knowledge of AF was better in the education intervention group than in the control group.
Koponen et al./2007	Quantitative research study to determine knowledge improvement of AF 3 months after discharge from ER. An AF knowledge test was given at discharge and again 3 months later.	Patient in participating ER with ECG showing AF, volunteer N=200	Knowledge of AF test (KAF). Questions based on scientific-evidence included. Deemed appropriate by panel of experts.	Persons with AF had a moderate level of knowledge regarding AF in emergency room and limited improvement shown on three month follow-up.
Lane et al./ 2006	Quantitative research study with initial interview to assess AF knowledge. Education was provided. Knowledge was reassessed by interview 8 weeks later.	Documented AF > 3 months, current or past use of warfarin, outpatient clinic in AL and volunteer. N= 93 initial participants N= 33 completion participants.	Questionnaire used to evaluate AF knowledge. Educational booklet based on booklets developed by the British Heart Foundation. No reliability or validity established by either tool.	Overall knowledge of AF and anticoagulation was poor and did not significantly improve with education after eight weeks.

Table 1 Continued

McCabe et al./2008	Quantitative research study to assess knowledge of persons with AF. Education was provided. Knowledge was assessed 2 weeks later.	Diagnosed AF within the last 3 months, patient in participating hospital, English speaking, and no sensory or cognitive impairments, volunteer N=100	Interview tool created based on the education provided at the participating hospital. Pilot testing conducted to determine validity. Reliability established for the interview tool with the primary researchers.	Knowledge of AF was not desirable despite educational intervention.
McCabe et al./2011	Qualitative research study with a descriptive design used to understand experiences of persons with AF.	Persons in participating clinic with paroxysmal AF, English speaking and volunteer. N=15	Face to face interview about experience with AF.	A few of the themes identified included: "finding the meaning of symptoms, feeling uninformed and unsupported"
Xu et al./2010	Quantitative research study used to evaluate knowledge, attitude and behavior (KAB) in AF patients undergoing radiofrequency catheter ablation (RFCA).	Documented AF (by 2 ECG's) in persons undergoing RFCA, volunteer. N=116	Questionnaire on KAB of AF in patients undergoing RFCA. Four parts including demographics, knowledge of AF, attitude, and behavior were assessed. KAB determined to have good reliability and validity.	Identified knowledge deficits in regards to AF. The study identified knowledge as a way to improve self-management of AF.

Knowledge and Perception of AF

Lack of knowledge about AF has been identified by several investigators as an

important issue that should be addressed (Koponen, et al., 2007; Lane et al., 2006;

McCabe, et al., 2008; Xu, et al., 2010). In two studies, about one-half of persons with AF

did not consider it a serious condition (Koponen et al., 2007; Lane et al., 2006).

Individuals have knowledge deficits in relation to the purpose of AF management; the

purpose of medication and medications side effects; and symptoms to report to their

health care provider. It was noted that approximately 50% of individuals with AF do

not know that AF puts them at higher risk for stroke (Lane et al., 2006; McCabe et al.,

2008; Xu, et al., 2010). Studies also showed that the signs and symptoms of AF are not

readily recognized (Koponen et al., 2007; McCabe et al., 2008; Xu et al., 2010), making

it difficult for persons with AF to know the signs and symptoms to report to their health

care provider. Knowledge deficits regarding AF are important to recognize so that

appropriate patient education can be implemented. Individuals need to be able to

understand their condition in order to optimize the self-management of their AF

(Hendriks et al., 2013; Lane et al., 2006; Koponen et al., 2007; McCabe et. al, 2008; Xu

et al., 2010).

Knowledge of Anticoagulation

Studies have shown that individuals on anticoagulation recognize the purpose for

anticoagulation but have deficient knowledge about the risks associated with taking

anticoagulants (Koponen et al., 2007; Lane et al., 2006; McCabe et al., 2008; Xu et al.,

2010). The purpose for preventing thrombus was recognized but the correlation for

prevention of strokes was lacking (Lane et al., 2006). Previous research has shown that

individuals taking anticoagulants were aware of the need for monitoring of blood levels

and over one-half of these persons (50-76%) were aware of their goal International

Normalized Ratio (INR) levels (Koponen et al., 2007; Lane et al., 2006; McCabe et al.,

2008; Xu et al., 2010). INR is the standardized laboratory value used to measure the

bloods ability to clot. If INR level is too low there is an elevated risk of thrombus

formation; if INR levels are too high there is an increased risk of bleeding (AHA, 2012d).

Even though there was awareness of INR monitoring and goal INR, individuals with AF

who were on anticoagulation demonstrated a decreased knowledge of signs of excess

anticoagulation. The study by McCabe et al. (2008) showed that only 12% of individuals were able to identify multiple signs of excess anticoagulation. Lane et al. (2006) reported that only 40% of persons on anticoagulation identified an increased risk of bleeding as a side effect. Study participants also demonstrated a lack of knowledge regarding medication drug interactions and diet concerns with anticoagulants such as warfarin (Lane et al., 2006; Koponen et al., 2007; McCabe et al., 2008; Xu et al., 2010).

Characteristics Contributing to
Knowledge Level Related to AF

Individual characteristics, including demographics (gender, level of education, and age) and condition of the individual (previous diagnosis, current health status, and obtainment of normal rhythm), were assessed by investigators to determine if a specific demographic was more likely to correlate with lower levels of knowledge regarding AF and its treatment. Investigators were not able to consistently correlate gender and knowledge of AF. McCabe et al. (2008) showed no difference between knowledge levels in men and women. However, Xu, et al. (2010) associated higher levels of knowledge of AF in women than men and Koponen et al. (2007) showed higher levels of knowledge of AF in men than women. Higher levels of education were associated with higher AF knowledge (McCabe et. al, 2008 & Xu et al., 2010). McCabe et al. (2008) also reported that younger persons with AF had higher AF knowledge levels and persons with lowest level of knowledge were persons in the oldest age group. Men and women who considered themselves to have overall good health, were more likely to have a higher knowledge level of AF (Koponen et al., 2007 & McCabe et al., 2008).

Patient Education in Relation to AF

Education about AF may help improve the management of AF (Hendriks et al.,

2013; Lane et al., 2006; McCabe et al., 2008; Xu et al., 2010). However, the literature

reviewed showed that individuals with AF who undergo educational intervention do not

always retain the information, and demonstrate a deficit in AF knowledge even after the

intervention (Lane et al, 2006; McCabe et al., 2008). Individuals with AF also reported

that they felt "uninformed and unsupported" by health care providers (McCabe et al.,

2011, p. 338). Possible explanations for poor knowledge level of AF, even with

educational intervention, were frequency and timing of education (Koponen et al., 2007;

McCabe et al., 2008; Xu et al., 2010), time spent on education, and the amount and

complexity of the information provided (Lane et al., 2006 & McCabe et al., 2008). The

possible explanations for the knowledge deficits in relation to AF support the idea that

uncertainty results from the complexity of the treatment presented in the Uncertainty in

Illness Theory (Mishel, 1988).   Investigators recommended that in order to improve

individuals' attitudes about AF and self-management behaviors, an emphasis should be

placed on patient education (Hendriks, et al., 2013, McCabe, et al., 2008; Xu, et al.,

2010). However, educational interventions for AF need to be improved due to the

observed knowledge deficits about AF that persist after educational intervention

(Hendriks, et al., 2013, Koponen et al., 2007; Lane et al., 2006, McCabe et al., 2008; Xu

et al., 2010).

Uncertainty in Illness Theory

While limited research has been done specifically on how the Uncertainty in Illness Theory relates to AF, Kang et al. (2004) applied the framework to persons with AF. Using Mishel's theory, uncertainty was explored in order to explain individuals' response to AF, including perceptions of physical, mental, and general health. The studies revealed that symptom severity and frequency were positive predictors of uncertainty and had a negative effect on mental and general health (Kang, 2004, 2005, 2011). Kang proposed that without precise expectations of AF, individuals may have a difficult time with predicting the course of AF. Difficulty predicting the course of illness can lead to higher levels of stress for individuals, thus leading to greater levels of uncertainty. Other studies in persons with different illnesses also demonstrated a relationship between level of uncertainty and seriousness of illness and stress as well (Mishel, 1984). Some individuals undergoing treatment of AF reported that providers are not informative or supportive when they were diagnosed with AF. They believed that adequate information was not given to them about AF, leading to unrealistic expectations about AF. This led to feelings of undpredicatability of illness and emotional distress (McCabe et al., 2011).

Helping individuals become more knowledgeable about their illness, to understand their symptoms, and create new perceptions of their illness in times of stress (Mishel, et al., 2002) have been used to decrease levels of uncertainty in illness. Lack of information was shown to have the strongest relationship between uncertainty and stress in persons hospitalized with illness, and led to "increased perception of unpredictability

of events" (Mishel, 1984, p.167). Thus, educational interventions would be an important step in helping persons with AF to identify, understand, and learn management strategies to control AF. Educational interventions would be able to reduce levels of uncertainty and aid persons in management of AF. Social support was also a predictor of decreased levels of uncertainty in individuals with AF, even more so than educational interventions (Kang, 2011). Social support has been shown to give individuals a chance to understand their illness through conversations and interaction with other people. Supportive others can provide resources and information about the illness and help people cope with the situation (Mishel & Braden, 1987). Therefore, education, structured support, and opportunities to discuss AF and its treatment may be valuable interventions to decrease levels of uncertainty and improve the overall health of the individual with AF (Kang et al., 2004).

<center>Identified Gaps in Literature</center>

More research needs to be conducted about individuals' knowledge and educational needs regarding AF. As researchers in the aforementioned studies have indicated, there have been very few studies conducted to evaluate the knowledge level of persons with AF (Koponen et al., 2007; Lane et al., 2006; McCabe et al., 2008; Xu, 2010), despite the fact that AF prevalence and associated health care costs are growing (NHLBI, 2010).

If educational needs for the AF population are identified, interventions can be put into place to provide appropriate and effective educational tools. Past studies with other

chronic diseases, such as chronic obstructive pulmonary disease (COPD), have shown

that structured education is needed to help individuals improve quality of life

(Efraimsson, Hillervik, & Ehrenberg, 2008). Persons with intestinal failure also showed

that, when provided with individualized patient education, there was an improvement in

knowledge level and health outcomes (Culkin, Gabe, & Madden, 2009).

Finally, limited research has been conducted on the education needs of persons

with AF using the Uncertainty of Illness Theory (Mishel, 1988) as the conceptual

framework for the study. Research has shown that there are gaps in knowledge of AF in

the AF population (Koponen et al., 2007; Lane et al., 2006; McCabe et al., 2008; Xu, et

al., 2010). As previously discussed, lack of information and lack of clarity is related to

increased levels of uncertainty (Mishel, 1984). As demonstrated by previous research,

educational interventions can improve knowledge levels and decrease levels of

uncertainty in illness (Lemaire & Lenz, 1995; Mishel, 1997; Braden, Mishel, &

Longman, 1998; Kazer, et al., 2011, Mishel et al., 2002). Kang et al. (2004) suggested

that providing education and support to the AF population may be beneficial in

decreasing levels of uncertainty in individuals with AF. However, more research needs

to be conducted on the specific education needs for individuals with AF. This study will

assess AF knowledge level in the AF population.

Summary

AF may require complex management strategies that differ between individuals.

Persons with AF have demonstrated that they have gaps in their knowledge level

regarding AF. They do not always consider AF serious; do not understand management

strategies including medications like anticoagulation; and do not always recognize the

symptoms that indicate AF or the symptoms that should prompt a call to their health care

provider. This lack of information can lead to levels of uncertainty, causing stress in

illness, and interfere with illness-self-management. Educational strategies are not always

effective in improving knowledge levels of AF. This area requires further exploration in

order to create nursing interventions that are beneficial to individuals with AF.

CHAPTER 3

METHODS

Design

This exploratory study used a descriptive, cross sectional design to identify knowledge levels of persons with AF. The AF Knowledge Scale was used to measure level of knowledge about the disease, recognition of symptoms, and understanding of therapy used in AF (Hendriks et al., 2013). Demographic variables were also collected and analyzed.

Population and Sample

A convenience sample of persons receiving treatment of AF at an outpatient cardiology clinic were asked to participate in the study. The target sample size for the study was calculated to be 123 persons based on 154 persons with AF treated in the outpatient clinic in the fourth quarter of 2012, using a 95% confidence level and a confidence interval of 4 (Creative Research Systems, 2012). Inclusion criteria were: age 21 or older; able to read, speak, and write English; diagnosis of AF; and willingness to participate in the study.

Setting

The study was conducted in an outpatient cardiology clinic which provided a comprehensive cardiac care to residents of central, south central and eastern Montana and northern Wyoming. Services included clinical cardiology consultation, noninvasive diagnostic cardiology, interventional cardiology, and vascular intervention. Clinic staff also provided cardiology consultation in a rural outreach community.

Procedures for Data Collection

Data were collected during a 14 week period of time, from October to December 2013. The cardiologist or physician assistant (PA) in the clinic where the study was conducted identified eligible persons with a diagnosis of AF. Office staff, primarily registered nurses (RN), then screened and consented participants following an orientation to the study using a written protocol provided by the primary investigator (see Appendix A). Persons who were interested in participating were given a cover letter explaining the study and the AF Knowledge Scale (see Appendix B). The cover letter included a description of the study, measures to ensure confidentiality, and contact information for the primary investigator (PI) and her faculty advisor. Willingness to complete the AF Knowledge Scale was considered consent. Completed AF Knowledge Scales were collected by office staff and placed in a designated folder in a secure location in the cardiology clinic. Completed scales were collected by the PI on a weekly basis and stored

in a locked file cabinet at the home of the PI. No identifiable data were gathered to maintain anonymity of study participants.

<div align="center">Instruments</div>

The AF Knowledge Scale was used in this study to measure AF related knowledge and detects deficits in knowledge level. The AF Knowledge Scale was developed by Hendriks et al. (2013) and was based on a questionnaire used by Lane et al. (2006) and knowledge scales that were used in studies of heart failure (Linne, Liedhom, & Israelsson, 1999, van der Wal, Jaarsma, Moster, & van Veldhuisen, 2005). The AF Knowledge Scale has established content, face, and construct validity (Hendriks et al., 2013). Content and face validity was deemed appropriate by a panel of 24 cardiology nurses and two cardiologists. Construct validity was determined by factor analysis. Reliability was considered acceptable by calculation of Cronbach's α of 0.58 in the studied population. The scale also proved to have appropriate sensitivity for identification of persons with knowledge gaps of AF.

The AF Knowledge Scale is a questionnaire consisting of eleven questions. Three items address AF in general; three items address recognition of symptoms; three items address treatment of AF; and two items address attitudes about AF. Questions are in a multiple choice format, with only one correct answer. Correct answers are worth one point; incorrect answers are worth zero points. Sum scores can range from 0-11. Higher scores correlate with higher knowledge levels of AF.   Demographic data gathered for this study included age, gender, race, ethnicity, marital status, education level, date

diagnosed with AF, pattern of AF, and CHADS2 score (Hendriks et al., 2013).

Diagnosed pattern of AF (paroxysmal, persistent, or permanent) was indicated by the

provider on the questionnaire form. On the demographic portion of the questionnaire the

participant reported the following diagnoses in addition to AF: congestive heart failure,

hypertension, diabetes, and history of a previous stroke. CHADS2 score were calculated

by the PI (See Appendix C).

<div align="center">Human Subjects Consideration</div>

This study was approved by the university and community Institutional Review

Boards (IRB) where the study took place. Permission to conduct research was also

obtained from the managers of the outpatient cardiology clinics where the collection of

data occurred.

<div align="center">Statistical Analysis</div>

Data gathered from the AF Knowledge Scale were prepared and entered into

Microsoft Excel by the PI for statistical analysis. Individual knowledge scores were then

calculated. Results were described using percentages, means, and standard deviations.

Frequency distributions were also calculated. This analysis was done for each section of

the knowledge scale and the knowledge scale as a whole. Demographic variable

information was also entered into Excel by the PI and analyzed using descriptive

statistics. Demographic variables were described using the calculated percentages, mean

and standard deviation, when appropriate.

CHAPTER 4

RESULTS

<u>Sample Demographics</u>

The study was conducted over a 14 week period of time from October 2013 through December 2013. Twenty-seven persons with AF completed surveys during the data collection period. Table 2 provides the demographic data for the sample.

The mean age of study participants was 70 years, with 51 being the youngest and 81 being the oldest. The majority of study participants were male (62.9%, n=17), white (100%, n=27), non-Latino (100%, n=27) and married (74%, n=20). There were wide variances in level of education with the largest percentage of participants having Bachelor's degrees (29.6%, n=8). This was followed by high school education (25.93%, n=7), doctoral degree (14.8%, n=4), some college but no degree (14.8%, n=4), master's degree (7.4%, n=2), less than 12th grade (7.4%, n=2), associate degree (3.7%, n=1), and trade school education (3.7%, n=1).

Table 2: Demographics

Demographics (N=27)			
Characteristic	Response	Number of Cases	% of Total Sample
Age	50-55 years	2	7.4
	56-65 years	6	22.2
	66-74 years	10	37
	75+ years	9	24.3
Gender	Male	17	63
	Female	10	37

Table 2 Continued

Race	White	27	100
Heritage	Non-Latino	25	92.6
	Not Indicated	2	7.4
Marital Status	Married	20	74.1
	Single	7	25.9
Education	Less than 12th grade	2	7.4
	High School	7	25.9
	Some College, No degree	4	14.8
	Trade School	1	3.7
	Associate Degree	1	3.7
	Bachelor's Degree	8	29.6
	Master's Degree	2	7.4
	Doctorate Degree	4	14.8
Length of AF Diagnosis	<1 year	10	37
	2-5 years	9	24.3
	>5 years	7	25.9
AF Pattern per Participant	Paroxysmal	12	44.4
	Persistent	3	11.1
	Permanent	9	24.3
	Unknown/Left Blank	3	11.1
AF Pattern per Provider	Paroxysmal	6	22.2
	Persistent	0	0
	Permanent	9	24.3
	Unknown/Left Blank	12	44.4
CHADS2 Score	0	3	11.1
	1	14	51.9
	2	5	18.5
	3	5	18.5

AF Pattern

Study participants indicated their AF pattern as paroxysmal, persistent, or

permanent. This was then compared with the provider's assessment of AF pattern. The

majority of participants reported their AF pattern was paroxysmal (44.4%, n=12). Three

participants (11.1%) indicated that they had persistent AF and nine participants (33.3%)

indicated that their AF pattern was permanent. Three participants (11.1%) either did not know their AF pattern or left the question blank.

The participant AF patterns as noted by the provider indicated six participants (22.2%) with paroxysmal AF, zero participants with persistent AF, and nine participants (33.3%) with permanent AF. One participant had an unknown AF pattern according to the provider and eleven (40.7%) had no AF pattern indicated by the provider.

Of the surveys conducted that had indicated AF patterns by both the participant and the provider, 14.81% (n=4) had matching patterns and 44.4% (n=12) did not. The majority (48.2%, n=13) did not have an AF pattern indicated or had an unknown AF pattern. Table 2 details the AF pattern for study participants, as indicated by both the provider and the participant.

<u>CHADS2 Score</u>

CHADS2 scores were calculated based on age provided by participants and by participant responses to questions about co-morbid conditions of congestive heart failure, hypertension, diabetes, and stroke. The majority of participants (51.8%, n=14) had CHADS2 scores of 1. Next were participants with CHADS2 scores of >1 (37%, n=10). Finally, three participants (11.1%) had CHADS2 scores of 0. Table 2 details CHADS2 score for each participant.

AF Knowledge Results

The AF Knowledge Scale was used to evaluate participant knowledge of their AF. Overall, the mean score for the scale was 5.8 (52.5%). This was broken down into four categories based on content of the questions. The highest mean score for one category was AF attitudes (64.8% correct) with general AF scoring next highest (60.5% correct). The lowest mean scores were questions about AF treatment (46.9% mean score) and AF symptoms (42% mean score). Table 3 contains specific results for individual questions. Table 4 and Table 5 show the frequency distribution for the entire AF knowledge scale and for the individual content categories for the AF knowledge scale.

Table 3: Result of Each Component of the AF Knowledge Scale

Result of each component of the AF Knowledge Scale (N=27)		
Category / Questions	Participants with correct answer (n)	Participants with correct answer (%)
AF General		
1. When to seek treatment	10	37
2. Rarity of AF	18	66.7
3. Risk of asymptomatic AF	6	22.2
AF Symptom Recognition		
1. Definition of AF	18	66.7
2. Preventing symptoms with treatment	22	81.5
3. Triggers for AF	9	33.3
AF Treatment/Therapy		
1. Purpose of anticoagulation	22	81.5
2. Anticoagulation and alcohol	8	29.6
3. Thrombosis Center/Coagulation Clinic	8	29.6
AF General Attitude		
1. Physical exercise and AF	26	96.3
2. Risk of AF	9	33.3

Table 4: Frequency Distribution for Individual Categories on the AF Knowledge Scale

Frequency distribution (n of total sample=27) for individual categories on the AF Knowledge Scale				
Score (%)	AF General (n)	AF Symptom Recognition (n)	AF Treatment/Therapy (n)	AF Attitude (n)
0.00%	2	6	3	1
33.34%	8	9	12	
50%				17
66.68%	10	11	10	
100%	7	1	2	9

Table 5: Frequency Distribution for the AF Knowledge Scale

Frequency distribution (n of total sample=27) for the AF Knowledge Scale		
Score	Frequency	% of Participants
3	3	11.1
4	3	11.1
5	6	22.2
6	5	18.5
7	5	18.5
8	5	18.5

AF Knowledge Scale Results
Based on Participant Age

Participants aged 50-55 (n=2) scored the highest overall with a mean score of 7. This age group scored the highest the AF general category and the AF treatment category as well (83.8%, 66.7%, respectively). Participants in the 50-55 and 56-65 age categories had the highest percentage (50%) correct in the AF symptoms category. Interestingly, the older the age of the participants, the higher the score in the AF attitude category. Participants aged 50-55 scored 50% in this category, participants aged 56-65 (n=6) scored 58.33%, 66-74 (n=10) scored 65%, and the age 75+ category (n=9), had the

highest percentage (72.2%) correct in the AF attitude category. Table 6 provides specific

means, standard deviations, and percentages for the knowledge scale.

Table 6: AF Knowledge Results for Demographics and Participant Characteristics

AF Knowledge Results for Demographics and Participant Characteristics							
Character-istic	Response and n	Mean Score /% Correct AF Knowledge Score	SD	AF General % Correct	AF Symptom % Correct	AF Treatment % Correct	AF Attitude % Correct
Age	50-55	7 (63.6)	1.4	83.3	50	66.7	50
	56-65	6 (54.5)	1.8	72.2	50	38.9	58.3
	66-74	5.4 (49.1)	1.5	63.3	30	43.3	65
	75+	5.8 (52.5)	1.8	44.4	48.2	51.9	72.2
Gender	Male	5.5 (49.7)	1.7	60.8	37.3	43.1	61.8
	Female	6.3 (57.2)	1.5	60	50	53.3	70
Marital Status	Married	5.65 (51.4)	1.6	58.3	36.7	50	65
	Single	6.1 (55.8)	1.8	66.7	57.1	38.1	64.3
Education	<12th grade	5.5 (50)	0.7	50	33.3	66.7	50
	High School	4.7 (42.9)	0.95	61.9	23.8	42.9	42.9
	Some College/No Degree	5.3 (48.5)	2.1	66.7	22.2	33.3	83.3
	Trade School	7 (63.4)		66.7	66.7	33.3	100
	Associate Degree	8 (72.7)		100	100	33.3	50
	Bachelor's Degree	6.5 (59.1)	1.8	62.5	45.8	54.2	81.3
	Master's Degree	5.5 (50)	2.1	66.7	50	33.3	50
	Doctorate Degree	6 (54.5)	2	33.3	66.7	55.6	66.7
CHADS2 Score	0	7 (63.6)	1	77.8	55.6	55.6	66.7
	1	5.4 (49.4)	1.3	54.8	35.7	42.9	71.4
	2	5.4 (49.1)	2.1	66.7	53.3	33.3	40
	3	6.4 (58.2)	2.1	60	40	66.7	70
AF Pattern Per Participant	Paroxysmal	6.3 (57.6)	1.6	66.7	55.6	44.4	66.7
	Persistent	5 (45.5)	1	66.7	44.4	33.3	33.3
	Permanent	5.4 (49.5)	1.7	51.9	33.3	55.6	50
	Unknown/Not indicated	5.3 (48.5)	1.1	55.6	11.1	44.4	100
AF Pattern Per Provider	Paroxysmal Persistent	6 (54.5)	1.1	55.6	50	55.6	58.3
	Permanent	4.4 (40.4)	1.4	44.4	29.6	37	55.6
	Unknown/Not indicated	6.7 (60.1)	1.4	75	47.2	50	75

AF Knowledge Scale Results
<u>Based on Participant Gender</u>

        Women (n=10) scored higher on the overall AF knowledge scale with a mean

score of 6.3. Men (n=17) had a mean score of 5.5. Women also had a higher percentage

correct in each category, with the exception of the AF general category where the

percentages for men and women was very similar (60.8%, 60% respectively). Table 4-5

provides specific means, standard deviations, and percentages for the knowledge scale.

AF Knowledge Scale Results
Based on Marital Status

Single participants (n=7) had a mean score of 6.1 on the overall AF knowledge

scale. Married participants (n=20) had a mean score of 5.7 on the overall AF knowledge

scale. When broken down into categories the single participants scored higher (66.7%) in

the AF general category and scored higher (57.1%) in the AF symptoms category.

Married participants scored higher (50%) in the AF treatment category and scored higher

(65%) in the AF attitude category. Table 6 provides specific means, standard deviations,

and percentages for the knowledge scale.

AF Knowledge Scale Results
Based on Education Level

The highest score on the AF knowledge scale was a score of 8. The participant

with that score had an associate degree level of education. The second highest score on

the AF knowledge scale was a score of 7. The participant with that score had some

college with no degree and trade school level of education. Following the two highest

overall scores, in order, from highest to lowest, bachelor's degree (n=8, mean score 6.5),

doctoral degree (n=4, mean score 6), master's degree (n=2, mean score 5.5) and less than

12th grade education (n=2, mean score 5.5), some college and no degree (n=4, mean

score 5.3), and high school education (n=7, mean score 4.7). Table 6 provides specific

means, standard deviations, and percentages for the knowledge scale.

AF Knowledge Scale Results
Based on CHADS2 Score

CHADS2 scores were calculated based on participant responses to questions about co-morbid conditions of congestive heart failure, hypertension, diabetes, and history of stroke. Age of participant was also used to calculate a CHADS2 score. Two participants did not provide information on whether they had congestive heart failure (CHF). Participants who did not report if they had CHF were given a score of zero for the CHF category. Participants with a CHADS2 score of zero (n=3) had a mean score of seven (63.6%) for the overall AF knowledge scale. They scored 77.8% in the AF general category, 55.6% in the AF symptoms category, 55.6% in the AF treatment category, and 66.7% in the AF attitude category. Participants with a CHADS2 score of one (n=14) had a mean score of 5.4 (49.3%) for the overall AF knowledge scale. They scored 54.8% in the AF general category, 35.7% in the AF symptoms category, 42.9% in the AF treatment category, and 71.4% in the AF attitude category. Participants with a CHADS2 score of two (n=5) had a mean score of 5.4 (49%) for the overall AF knowledge scale. They scored 66.7% in the AF general category, 53.3% in the AF symptoms category, 33.4% in the AF treatment category, and 40% in the AF attitude category. Participants with a CHADS2 score of three (n=5) had a mean score of 6.4 (58.2%) for the overall AF knowledge scale. They scored 63.3% in the AF general category, 46.7% in the AF symptoms category, 50% in the AF treatment category, and 55% in the AF attitude category. Table 6 provides specific means, standard deviations, and percentages for the knowledge scale.

AF Knowledge Scale Results
Based on AF Pattern

Participants indicated whether their AF pattern was paroxysmal, persistent or permanent. Participants who indicated a paroxysmal AF pattern (n=12) had a mean score of 6.3 (57.6%) for the overall AF knowledge scale. They scored 66.7% in the AF general category, 55.6% in the AF symptoms category, 44.4% in the AF treatment category, and 66.7% in the AF attitude category. Participants who indicated a persistent AF pattern (n=3) had a mean score of 5 (45.5%) for the overall AF knowledge scale. They scored 66.7% in the AF general category, 44.4% in the AF symptoms category, 33.3% in the AF treatment category, and 33.3% in the AF attitude category. Participants who indicated a permanent AF pattern (n=9) had a mean score of 5.4 (49.5%) for the overall AF knowledge scale. They scored 51.8% in the AF general category, 33.3% in the AF symptoms category, 55.6% in the AF treatment category, and 50% in the AF attitude category. Participants who indicated that the AF pattern was unknown (n=2) or did not indicate an AF pattern (n=1) had a mean score of 5.3 (48.5%) for the overall AF knowledge scale. They scored 55.6% in the AF general category, 11.1% in the AF symptoms category, 44.4% in the AF treatment category, and 100% in the AF attitude category.

The provider also indicated the pattern of AF for each participant. Participants who had paroxysmal AF (n=6), as indicated by the provider, had a mean score of 6 (54.5%) for the overall AF knowledge scale. They scored 55.6% in the AF general category, 50% in the AF symptoms category, 55.6% in the AF treatment category, and

58.3% in the AF attitude category. Participants who had permanent AF (n=9), as indicated by the provider, had a mean score of 4.4 (40.4%) for the overall AF knowledge scale. They scored 44.4% in the AF general category, 29.6% in the AF symptoms category, 37% in the AF treatment category, and 55.6% in the AF attitude category. Participants who either had an unknown pattern of AF (n=1), as indicated by the provider, or did not have an AF pattern indicated by the provider (n=11), had a mean score of 6.7 (60.1%) for the overall AF knowledge scale. They scored 75% in the AF general category, 47.2% in the AF symptoms category, 50% in the AF treatment category, and 75% in the AF attitude category.

Participant and provider AF pattern congruence was not determined for several participants (n=13) due to an unknown AF pattern or an AF pattern that was not indicated. Mean score for this group of participants was 6.4 (58%) for the overall AF knowledge scale. They scored 69.2% in the AF general category, 46.2% in the AF symptoms category, 46.2% in the AF treatment category, and 76.9% in the AF attitude category. Participants who did not have a matching AF pattern to the pattern indicated by the provider (n=4) had a mean score of 4.7 (43.2%) for the overall AF knowledge scale. They scored 58.3% in the AF general category, 33.3% in the AF symptoms category, 41.7% in the AF treatment category, and 37.5% in the AF attitude category. Participants who did have a matching AF pattern to the pattern indicated by the provider (n=10) had a mean score of 5.4 (49.1%) for the overall AF knowledge scale. They scored 50% in the AF general category, 40% in the AF symptoms category, 50% in the AF treatment

category, and 60% in the AF attitude category. Table 6 provides specific means, standard deviations, and percentages for the knowledge scale.

AF Knowledge Scale Results
Based on Length of AF Diagnosis

Participants were asked when they were first diagnosed with AF. Participants who have had a diagnosis of AF for less than one year (n=10) had a mean score of 6.4 (58.2%) for the overall AF knowledge scale. They scored 70% in the AF general category, 43.3% in the AF symptoms category, 56.7% in the AF treatment category, and 65% in the AF attitude category. Participants who have had a diagnosis of AF for two to five years (n=9) had a mean score of 4.9 (44.4%) for the overall AF knowledge scale. They scored 48.1% in the AF general category, 37% in the AF symptoms category, 37% in the AF treatment category, and 61.1% in the AF attitude category. Participants who have had a diagnosis of AF for six of more years (n=7) had a mean score of 6.3 (57.1%) for the overall AF knowledge scale. They scored 66.7% in the AF general category, 42.9% in the AF symptoms category, 52.4% in the AF treatment category, and 71.4% in the AF attitude category. One participant did not indicate the date of AF diagnosis. Table 6 provides specific means, standard deviations, and percentages for the knowledge scale.

Questions Left Blank on the AF Knowledge Scale

There were eleven total questions on the AF Knowledge Scale. Over one half of participants left at least one question blank. Question number one regarding AF triggers

was most frequently left blank (55.6%; n=15) by participants. Questions six, ten, and

eleven were also frequently left blank by participants (22.2%, n=6; 14.8%, n=4; and

22.2%, n=6, respectively). Question number seven, asking if AF is a rare condition ,,

was the only question answered by all participants. See Table 7 for complete data

regarding questions that were not answered by participants.

Table 7: Questions Left Blank on the AF Knowledge Scale

Questions left blank on the AF Knowledge Scale (n=27)		
Question Number	Number of Participants who left the Question Blank	% Total Sample who left the Question Blank
1	15	55.6
2	1	3.7
3	2	7.4
4	2	7.4
5	1	3.7
6	6	22.2
7	0	0
8	2	7.4
9	1	3.7
10	4	14.8
11	6	22.2

Participant Helped with Wording of AF Knowledge Scale

Only one participant asked for RN assistance to explain wording of the AF

knowledge scale. The participant asked for an explanation of what "thrombosis center"

meant in question number eleven. The RN explained "thrombosis center" and the

participant was able to correctly answer the question.

CHAPTER 5

DISCUSSION

The purpose of this study was to identify AF patients' knowledge of the AF

disease process, symptoms, and treatment options. The research question addressed in

this study was: What are the educational needs of persons with AF?   The Uncertainty in

Illness Theory provided the framework for this study. This framework proposes that if

individuals are more knowledgeable about their illness they can create new perceptions of

the illness and decrease levels of uncertainty (Mishel, et al., 2002). This study

specifically focused on individual knowledge level of AF and factors that may influence

level of knowledge about AF. Factors that were evaluated in this study included

demographics, CHADS2 score, AF pattern, and length of AF diagnosis. With better

understanding of individual knowledge of AF, interventions can be designed to help

individuals manage their AF.The findings of this study support previous literature

indicating that individuals with AF lack knowledge about AF (Hendriks, et al., 2013;

Koponen, et al., 2007; Lane et al., 2006; McCabe, et al., 2008; Xu, et al., 2010).   The

only study that used the same tool to evaluate knowledge of AF was Hendriks et al.

(2013). When compared to the study by Hendriks et al. the overall knowledge if AF for

the population in this study was lower at 5.78 +/- 1.63, compared with 7.08+/- 2.41 and

7.98 +/- 2.14 at follow-up. The study by Hendriks et al. did not display results for the

individual AF categories tested, including 1) AF in general, 2) AF symptom recognition,

3) treatment of AF, and 4) general attitudes towards of AF. Results for individual

category results are discussed below.

AF in General

The study identified that when divided into categories, AF in general was the

second highest scoring category with a mean percentage of 60.49%. Questions in this

category were about when to seek care for AF and the seriousness and rarity of the AF

condition (Hendriks et al., 2013). The study by Lane et al. (2006) showed that on half of

individuals felt their AF was serious and just over half understood the potential

complications that could arise from AF. Koponen et al. (2007) demonstrated slightly

higher results with 73% of study participants understanding the rarity of AF and 84%

understanding when to seek treatment.

Atrial Fibrillation Symptom Recognition

The study identified that AF symptom recognition was the lowest scoring

category overall, with a mean percentage of 41.98%. Questions in this category were

about AF triggers, importance of medication, and definition of AF (Hendriks et al.,

2013). The study by McCabe et al. (2008) found that only 25% of individuals with AF

were able to list three or more symptoms of AF and only 32% were able to recognize

signs and symptoms of stroke.

Treatment of Atrial Fibrillation

The study identified that the AF treatment category also had a fairly low score with a mean percentage of 46.91%. Questions in this category were primarily about anticoagulation purpose, side effects, and monitoring (Hendriks et al., 2013). These finding corroborated the findings in the studies by Lane et al. (2006), McCabe et al. (2008) and Xu et al. (2010). Lane et al. reported that only 21% of persons with AF understood the benefit of stroke prevention from anticoagulants. Xu et al. reported that only 22% of persons with AF knew the purpose of monitoring their INR. McCabe et al. showed that 96% of persons with AF knew the purpose of anticoagulation, but only 12% were able to recognize signs and symptoms of anticoagulation.

General Attitudes Toward Atrial Fibrillation

The study identified that when divided into categories, general attitudes about atrial fibrillation was highest scoring category with a mean percentage of 64.81%. Questions in this category were about exercise and severity of AF (Hendriks et al., 2013). As mentioned previously the study by Lane et al. (2006) showed that only one half of individuals felt their AF was serious and just over half understood the potential complications that could arise from AF.

Factors Affecting Knowledge About AF

Many factors were considered when evaluating the results of the AF Knowledge Scale. Factors analyzed included age, gender, race and heritage, marital status, education level, AF pattern, length of diagnosis and CHADS2 score. Below will be a discussion about the factors that were found to affect individual knowledge of AF.

Age

This study showed that younger individuals scored higher on the AF Knowledge Scale overall and in most categories. Studies by Koponen et al. (2007) and McCabe et al. (2008) also demonstrated lower levels of AF knowledge (about AF in general and anticoagulation) in older individuals diagnosed with AF. Although the oldest participants showed lower overall scores they had the highest scores in the category about attitude about AF. General attitudes included information about physical exercise and level of danger associated with AF (Hendriks et al., 2013).

AF Pattern

Of the participants who indicated an AF pattern, those with paroxysmal AF had the highest level of knowledge. This is also true for those who the provider indicated that the AF pattern was paroxysmal. Only half of participants who indicated a pattern of paroxysmal AF had the same pattern indicated by the provider.   The participants who indicated the same AF pattern as the provider were compared. Participants with paroxysmal AF score had a higher mean score and higher scores in each of the AF

categories analyzed than participants with permanent AF. This could be because

participants who know they have paroxysmal AF can feel the symptoms and can

recognize the initiation and termination of episodes. This may make them more aware of

their AF and more in tune with symptoms and treatments to control episodes.

Interestingly, this differs from results reported by Xu et al. (2010) who found that

individuals who had persistent or permanent AF had better AF attitudes which correlated

with higher levels of AF knowledge.

Length of Diagnosis

Participants with a diagnosis of AF for one year or less scored the highest on the

AF knowledge scale overall and in each of the categories with the exception of the

category regarding AF general attitudes. Participants with a recent diagnosis could have

received education recently, contributing to higher scores. Although some of the

literature has shown that individuals with AF do not always retain information about their

AF after educational intervention (Koponen et al., 2007; Lane et al, 2006; McCabe et al.,

2008) other studies have shown improvement of AF knowledge after education

(Hendricks et al., 2013 & Koponen et al., 2007). Data about type and timing of AF

education was not collected for this study.

CHADS2 Score

This study showed that participants with a CHADS2 score of zero scored the

highest (mean 7, 63.6%) on the AF Knowledge Scale. They scored the highest in the

general AF and the AF symptoms category. However, 2/3 of the participants with

CHADS2 scores of zero were also in the youngest age category (50-55 years). This again shows that age may influence AF knowledge. Participants with the highest CHADS2 score of three showed the highest level of knowledge in the AF treatment and AF attitude category. Most (4/5) participants with CHADS2 scores of three were in the highest age category (75+), which again showed the highest scores in regards to AF general attitude.

It is important to understand the factors that influence individual's level of AF knowledge. Higher levels of knowledge about AF should correlate with lower levels of uncertainty, giving individuals a new perception about AF, helping them to manage their condition. Within the study it is important to look at all of the factors that influence knowledge level in order to best design tools and educational interventions. Education can help individuals manage their AF, decrease levels of uncertainty and improve health and quality of life (Kang et al., 2004).

<u>Study Limitations</u>

The first limitation to the study is that it was conducted in one outpatient cardiology clinic, in one state in the U.S. over a short period of time. Individuals who were part of this study were from a limited population and may not be representative of the entire population of individuals with AF.

The second limitation to this study was the small sample size (n=27). Again, this small sample size may not be representative of the entire population of individuals with AF. The small sample size also may influence the importance of the findings found in this study.

The third limitation to this study was the tool utilized. The AF Knowledge Scale is newly developed and has not been tested and utilized with large sample sizes (Hendriks et al., 2013). Furthermore, the tool was translated from the Netherlands and some of the question concepts may have been lost with translation.

The fourth limitation to this study is that data regarding education received about AF was not provided. Evaluation of knowledge levels based on what type and when education was received was therefore not done. This would have been useful because it would be helpful to evaluate timing and different types of education to help deliver patient centered education (McCabe et al., 2008). Furthermore, it may have been useful to provide an education intervention after administering the AF Knowledge Scale and then reevaluating scores after education. This would have helped guide management of individuals with AF in that it could help identify specific gaps in certain educational tools, helping to improve interventions (Hendriks et al., 2013).

Lastly, the Mishel Uncertainty in Illness Scale (MUIS) was not administered in the study. The MUIS can help to understand "perception of uncertainty in the areas of symptomatology, diagnosis, treatment, relationship with care-givers, and prognosis" (Mishel, 1984, p. 165). Use of Mishel's Uncertainty in Illness Scale would aid understanding of uncertainty and AF.

Implications

AF Knowledge Scale

The AF Knowledge Scale was determined to be a valid measure of knowledge levels in individuals with AF, however further reliability and validity testing in larger and more diverse groups should be considered (Hendriks et al., 2013). The scale was translated into English from Dutch (Hendriks et al., 2013) and some of the intended meaning may have been lost in translation. For example, question number eleven, "what is the function of the thrombosis center?" was left blank by six participants (22.22%) and one participant asked the RN conducting the survey for help understanding the terminology. After explanation of the term "thrombosis center" the participant was able to answer the question correctly. Several questions (13%) on the survey were left blank and it is unclear whether participants did not understand the terminology due to the language translation or if participants simply did not know the answers to questions. Furthermore, some of the questions were worded poorly. Question number one asked "what are the trigger factors for atrial fibrillation?" Fifteen participants (55.56%) left this question blank. Perhaps participants did not recognize that they had a trigger to their AF. Two participants noted on their survey that "none" are triggers for their own AF. Alternatively participants with permanent AF may believe it would not be important to recognize triggers.

Research

Previous research has shown that individual knowledge of AF is lacking in all areas, including general AF, AF symptoms, and AF treatment (including anticoagulation) (Hendriks et al., 2013; Koponen, et al., 2007; Lane et al., 2006; McCabe et al., 2008; McCabe, Schumacher, & Barnason, 2011; Xu, et al. 2010). Studies by Hendriks et al. (2013), Lane et al. (2006) and McCabe et al. (2008) all assessed specific educational interventions however none of the interventions were standardized. It would be beneficial to see the development of a standardized education protocol that was tested for individual improvement in AF knowledge. Furthermore, a study utilizing the Uncertainty in Illness Scale would help to understand the connection between knowledge and the illness experience (Mishel, 1984; 1988).

Education

This study supported previous research findings that there is a gap in knowledge about AF. Education interventions should be designed to address knowledge gaps, with a goal to improve management of AF and improve health of individuals with AF. Appropriate education may help support individuals with AF and improve knowledge of their condition and understanding of treatment (Lane et al., 2006). Furthermore, individuals who are more knowledgeable about their AF may develop better attitudes about AF and improve self-management behaviors (Hendriks et al., 2013; Xu et al., 2010).

It is also important for healthcare providers to understand factors that may limit knowledge of AF. The results of this study support previous findings that older age may be a limiting factor to knowledge of AF. This should be considered in education of individuals with AF. Other factors to consider when designing educational interventions would be learning styles, support systems, and timing of education (McCabe et al., 2008).

Conclusion

The results from this study are consistent with literature that indicates a less than desirable knowledge of AF in individuals who carry the diagnosis. Specific factors that most likely contribute to lack of knowledge are age and length of diagnosis. Past research has shown that patient-centered education programs can improve knowledge level of illness, thus improving perception and self-management skills. Higher levels of self-management and lower levels of uncertainty can improve outcomes and quality of life. AF is a serious condition that carries potential life-threatening consequences with it. It will be important to improve education practices in order to improve patient care and see better outcomes.

REFERENCES

American College of Cardiology. (2013). *Afib toolkit*. Retrieved from American College of Cardiology: http://www.cardiosource.org/Home/Science%20And%20Quality/Clinical%20Tools/Atrial%20Fibrillation%20Toolkit.aspx#TreatmentAndManagement

American College of Cardiology Foundation and American Heart Association. (2011). ACCF/AHA Pocket Guideline: Management of patients with atrial fibrillation. American College of Cardiology Foundation and American Heart Association, Inc.

American Heart Association. (2011). *Simplified AHA atrial fibrillation treatment guidelines*. Retrieved from American Heart Association: www.heart.org

American Heart Association. (2012a). *Why atrial fibrillation matters*. Retrieved October 16, 2012, from American Heart Association: http://www.heart.org/HEARTORG/Conditions/Arrhythmia/AboutArrhythmia/Why-Atrial-Fibrillation-AF-or-AFib-Matters_UCM_423776_Article.jsp

American Heart Association. (2012b). *What is atrial fibrillation*. Retrieved from American Heart Association: http://www.heart.org/HEARTORG/Conditions/Arrhythmia/AboutArrhythmia/What-is-Atrial-Fibrillation-AFib-or-AF_UCM_423748_Article.jsp

American Heart Association. (2012c). *What are the symptoms of atrial fibrillation (afib or af)?* Retrieved from American Heart Association: http://www.heart.org/HEARTORG/Conditions/Arrhythmia/AboutArrhythmia/Why-Atrial-Fibrillation-AF-or-AFib-Matters_UCM_423776_Article.jsp

American Heart Association. (2012). Patient's guide to taking warfarin. Retrieved from www.heart.org

American Heart Association. (2012e). Non-surgical procedures for atrial fibrillation. Retrieved from www.heart.org

American Heart Association. (2013). *Ischemic Strokes*. Retrieved from American Heart Association: www.stroke association.org

Bashore, T., Granger, C., & Hranitzky, P. P. (2012). Heart disease. In S. McPhee, & M. Papadakis, Current *Medical Diagnosis and Treatment 2012* (pp. 317-419). McGraw-Hill.

Braden, C. J., Mishel, M., & Longman, A. (1998). Self-help intervention project: women receiving breast cancer treatment. *Cancer practice*, 6(2), 87-98.

Creative Research Systems. (2012). *The Survey System*. Retrieved from Creative Research Systems: http://www.surveysystem.com/sscalc.htm#one

Coyne, K., Paramore, C., Grandy, S., Mercader, M., Reynolds, M., & Zimetbaum, P. (2006). Assessing the direct costs of treating nonvavular atrial fibrillation in the United States. *Value in Health*, 9(5), 348-356.

Culkin, A., Gabe, S. M., & Madden, A. M. (2009). Improving clinical outcome in patients with intestinal failure using individualized nutritional advice. *Journal of Human Nutrition and Dietetics*, 22, 290-298.

Efraimsson, E., Hillervik, C., & Ehrenberg, A. (2008). Effects pf COPD self-care management education at a nurse-led primary health care clinic. *Scandinavian Journal of Caring Sciences*, 22, 178-185.

Hendriks, J., Crijns, H., Tieleman, R., & Vrijhoef, H. (2013). The atrial fibrillation knowledge scale: development, validation, and results. *Internation Journal of Cardiology*.

Hunt et al. (2009). Focused Update Incorporated Into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults. *Journal of American College of Cardiology*, 53(15), e1-e90.

Kang, Y. (2005). Effects of uncertainty on perceived health status in patients with atrial fibrillation. *British Association of Critical Care Nurses, Nursing in Critical Care*, 10(4), 184-191.

Kang, Y. (2011). The relationships between uncertainty and its antecedents in Korean patients with atrial fibrillation. *Journal of Clinical Nursing*, 20, 1880-1886.

Kang, Y., Daly, B., & Kim, J. (2004). Uncertainty and its antecendents in patients with atrial fibrillation. *Western Journal of Nursing Research*, 26(7), 770-783.

Kazer, M., Bailey Jr., D., Sanda, M., Colberg, J., & Kelly, W. (2011). An internet intervention for management of uncertainty during active surveillance for prostate cancer. *Oncology Nursing Forum*, 38(5), 561-568.

Kim, M. H., Hussein, M., Kreilick, C., & Battleman, D. (2009, September 1). Cost of atrial fibrillation in United States managed care organizations. *Advances in Therapy*, 26(9), 847-857.

Kim, M., Johnston, S., Bong-Chul, C., Dalal, M., & Schulman, K. (2011). Estimation of total incremental health care costs in patients with AF in the United States. *Circulation: Cardiovascular Quality and Outcomes*, 4, 313-320.

Koponen, L., Rekola, L., Ruotsalainen, T., Lehto, M., Leino-Kilpi, H., & Voipio-Pulkki, L.-M. (2007, July). Patient knowledge of atrial fibrillation: 3-month follow-up after an emergency room visit. *Journal of Advanced Nursing*, 61(1), 51-61.

Lane, D. A., Ponsford, J., Shelley, A., Sirpal, A., & Lip, G. Y. (2006). Patient knowledge and perceptions of atrial fibrillation and anticoagulatn therapy: Effects of an educational intervention programme The West Birmingham Atrial Fibrillation Project. *International Journal of Cardiology*, 110, 354-358.

Linne, A., Liedhom, H., & Israelsson, B. (1999). Effects of systematic education on heart failure patients' knowledge after 6 months. A randomised, controlled trial. *European Journal of Heart Failure*, 1, 219-227.

McCabe, P. J., Schad, S., Hampton, A., & Holland, D. E. (2008, March/April). Knowledge and self-management behaviors of patients with recently detected atrial fibrillation. *Heart and Lung*, 37(2), 79-90.

McCabe, P. J., Schumacher, K., & Barnason, S. (2011). Living with atrial fibrillation: a qualitative study. *The Journal of Cardiovascular Nursing*, 26(4), 336-344.

Merriam-Webster Online Dictionary. (2013). *education*. Retrieved from merriam-webster.com

Merriam-Webster Online Dictionary. (2013). *knowledge*. Retrieved from merriam-webster.com

Mishel, M. (1984). Perceived uncertainty and stress in illness. *Research in Nursing and Health*, 7, 163-171.

Mishel, M. (1988). Uncertainty in illness. *Image: The Journal of Nursing Scholarship*, 20, 225--231.

Mishel, M. (1997). Uncertainty in acute illness. *Odyssey*, 15, 57-80.

Mishel, M., & Braden, C. J. (1987). Uncertainty: a mediator between support and adjustment. *Western Journal of Nursing Research*, 9, 43-57.

Mishel, M., Belyea, M., Germino, B., Stewart, J., Bailey, D., Robertson, C., & Mohler, J. (2002). Helping patinets with localized prostate carcinoman manage uncertainty and treatment side effects: Nurse dleviered psychoeducational intervention over the telephone. *Cancer*, 94, 1854-1866.

Naccarelli, G. V., Varker, H., Lin, J., & Schulman, K. (2009). Increasing prevalence of atrial fibrillation and flutter in the United States. *American Journal of Cardiology*. Retrieved 10 13, 2012, from AJConline.org

National Heart Lung and Blood Institute. (2008). *Division of Cardiovascular Diseases Strategic Plan*. Retrieved from National Heart Lung and Blood Institute: http://www.nhlbi.nih.gov/about/dcvd/sp/dcvd-sp-goal-2.3b.htm

National Heart Lung and Blood Institute. (2010). *Recovery act investments in atrial fibrillation*. Retrieved from http://www.nhlbi.nih.gov/recovery/media/afib.htm

National Heart Lung and Blood Institute. (2011). *What is atrial fibrillation*. Retrieved from National Heart Lung and Blood Institute: www.nhlbi.nih.gov/health/health-topics/topics/af/

National Institute of Neurological Disorders and Stroke. (2011). *Atrial fibrillation and stroke information page*. Retrieved from National Institute of Neurological Disorders and Stroke: http://www.

Sanofi-Aventis. (2009). Out of Sync: The State of AFib in America Survery. Yankelovich: Part of the Futures Company.

Shea, J. B., & Sears, S. F. (2008). A patient's guide to living with atrial fibrillation. *Circulation*, 117, e340-e343.

US National Library of Medicine. (2012). *Atrial fibrillation or flutter*. Retrieved from Medline Plus: http://www.nlm.nih.gov/medlineplus/ency/article/000184.htm

Van der Wal, H., Jaarsma, T., Moster, D., & van Veldhuisen, D. (2005). Development and testing of the Dutch heart failure knowledge scale. *European Journal of Cardiovascular Nursing*, 4, 273-277.

Wilson, B., Shannon, M., & Shields, K. (2011). *Pearson Nurse's Drug Guide 2011*. Upper Saddle River, NJ: Pearson.

Xu, W., Sun, G., Lin, Z., Chen, M., Yang, B., Chen, H., & Cao, K. (2010). Knowledge, attitude, and behavior in patients with atrial fibrillation undergoing radiofrequency catheter ablation. *Journal of Interventional Cardiology and Electrophysiology*, 28, 199-207.

APPENDICES

<u>APPENDIX A</u>

STAFF PROTOCOL

Danielle Martin, RN, BSN, Primary Investigator
FNP Graduate Student, Montana State University
Charlene Winters, PhD, APRN, ACNS-BC, Faculty Advisor

Evaluation of the Educational Needs of Persons with Atrial Fibrillation
Staff Instructions

I am conducting a study to investigate what persons diagnosed with atrial fibrillation know about atrial fibrillation. The questionnaire used will address atrial fibrillation in general, symptoms of atrial fibrillation, and treatment of atrial fibrillation. The study has been approved by Dr. Apostol and the Institutional Review Boards of Billings and Montana State University.

Your help is needed to distribute and collect the questionnaires. Patient participation in the study is voluntary and anonymous. **No names, medical record/account numbers, birthdates, or other identifying information should be written on questionnaires.** As many eligible patients as possible should be given the opportunity to complete the questionnaire. Eligible patients will be identified by the provider (MD or PA) based on the following criteria:

- Current diagnosis of atrial fibrillation (eligible patients will be identified by the MD or PA)
- Age 21 years or older
- Able to read and comprehend English

I am asking you to do the following:

1. Each day, confirm the eligibility of patients with appointments by checking with the MD or PA.
2. At the end of the patient's appointment, approach the patient and invite him/her to participate in the study.

    a. Provide a brief explanation of the study and purpose of the questionnaire (see Participant Explanation Letter)

3. If the patient expresses interest in participating, give him/her the following (located in a folder at the nurses' station at Cardiovascular Consultants of Montana):

    a. Participant Explanation Letter explaining the study.
    b. Questionnaire.
    c. Pencil.

4. Ask the patient to return the completed questionnaire to the desk.

5. After the survey is completed by the patient, please indicate the classification of atrial fibrillation (paroxysmal, persistent, or permanent) on the top of the survey. This information should be provided by the MD or PA.

6. Store completed questionnaires in the *Completed Questionnaire* study folder at the nurses' station at Cardiovascular Consultants of Montana.
7. Completed questionnaires will be picked up on a weekly basis.
      If you have any question or concerns you may contact me by phone or email. My contact information is:
- Cell: 861-3864
- Email: Danielle.fischer@msu.montana.edu

You may also contact my faculty advisor, Dr. Charlene Winters at: (406) 243-4608 or winters@montana.edu. Thank you for your willingness to help me with this research endeavor! I appreciate it!

Danielle Martin, RN, BSN

APPENDIX B

PARTICIPANT EXPLANATION FORM

**EVALUATION OF THE EDUCATIONAL NEEDS
OF PERSONS WITH ATRIAL FIBRILLATION**

Danielle Martin, RN, BSN
Participant Explanation Form

I am a graduate nursing student interested in learning more about the educational needs of persons with atrial fibrillation. I would like to learn what you know about atrial fibrillation in general, symptoms of atrial fibrillation, and treatment for atrial fibrillation. Please take a few minutes to complete the attached survey. Please return the survey to the person who gave it to you when finished.

If you decide to complete the survey, you will help nurses and providers better understand what persons with atrial fibrillation know about atrial fibrillation and areas where education on the topic needs to be improved. Your participation is voluntary and anonymous. Your answers will be analyzed with other peoples' answers as part of the research that I am doing. If you do not wish to complete the survey, tell the person who gave you the survey that you do not want to participate. Choosing or not choosing to complete the survey will not affect the care you receive from Cardiovascular Consultants of Montana.

You can contact me, Danielle Martin, at any time with any questions or concerns about the survey or my research. I can be reached at (406) 861-3864. You may also contact my advisor, Dr. Charlene Winters at (406) 243-4608. If you have concerns about your rights as a research participant, please contact Dr. Mark Quinn, the Chairman of the Institutional Review Board at Montana State University at (406) 994-6783

Thank you for your time.

Sincerely,

Danielle Martin, RN, BSN

Danielle.fischer@msu.montana.edu

APPENDIX C

STUDY QUESTIONNAIRE

EDUCATION NEEDS OF PERSONS WITH ATRIAL FIBRILLATION
Study Questionnaire

Answer the following questions to the best of your ability by entering the information requested in the blank provided or by checking the appropriate box. PLEASE PROVIDE ONLY ONE ANSWER PER QUESTION

---

1. **Year of birth?** _____

2. **What is your gender?**

   □ Male

   □ Female

3. **Which of the following best represents your race?**

   □ White

   □ Black or African American

   □ Asian

   □ Native American or Alaskan Native

   □ Hawaiian or Pacific Islander

   □ Other

   4. **Which of the following best represents your ethnicity or heritage?**

   □ Latino or Hispanic

   □ Non-Latino or Hispanic

4. **What is your marital status?**

   □ Single

   □ Married

Answer the following questions to the best of your ability by entering the information requested in the blank provided or by checking the appropriate box. PLEASE PROVIDE ONLY ONE ANSWER PER QUESTION.

5. **What is your <u>highest</u> level of education?**

   □Less than 12th grade

   □High school graduate

   □Some college, no degree

   □Trade/technical/vocational training Certificate

   □Associate degree

   □Bachelor's degree

   □Master's degree

   □Doctorate degree

6. **When were you diagnosed with atrial fibrillation?**

   Month/Year_____

7. **What is your pattern of atrial fibrillation?**

   □Paroxysmal (goes back and forth between a normal rhythm and an irregular/abnormal

   rhythm; episodes can occur frequently or infrequently)

   □Persistent (have episodes of irregular/abnormal rhythm lasting longer than 7 days;

   occasionally, have a normal/regular rhythm)

   □Permanent (always have an irregular rhythm)

   □Unknown

8. **Do you have congestive heart failure?**

   □ Yes

   □No

Answer the following questions to the best of your ability by entering the information requested in the blank provided or by checking the appropriate box. PLEASE PROVIDE ONLY ONE ANSWER PER QUESTION.

9. **Do you have high blood pressure?**

    □ Yes

    □No

10. **Do you have diabetes?**

    □ Yes

    □No

11. **Have you ever had a stroke?**

    □ Yes

    □No

Atrial Fibrillation Knowledge Scale

1. **What are the trigger factors for atrial fibrillation?**

    □Allergy to grass, animals or house dust

    □Alcohol, coffee, or spicy food

    □Noise or loud sounds

2. **Why is it important to take my medication for atrial fibrillation properly?**

    □Because the doctor wants me to

    □To prevent severe consequences of the arrhythmia

    □To prevent the possibility of a heart attack or sudden death

Answer the following questions to the best of your ability by checking the box next to the correct answer. PLEASE PROVIDE ONLY ONE ANSWER PER QUESTION.

3. **If atrial fibrillation is identified without the patient experiencing any complaints, the patient should immediately visit the hospital.**

    □True

    □False

    □Don't know

4. **What is atrial fibrillation?**

    □A heart disease in which the heart is not able to pump a sufficient amount of blood through the body

    □A blood disorder causing blood clots in the heart

    □An electrical disorder in the atria of the heart which results in the heart contracting too fast and irregularly

5. **Why is oral anticoagulation medication prescribed in certain patients with atrial fibrillation?**

    □To prevent the risk of blood clots which can cause a stroke

    □To make the blood flow more easily through the body

    □To prevent fluid retention in the body

6. **Why should a person using anticoagulation medication be careful with the use of alcohol?**

    □Alcohol increase the retention of fluid in the body resulting in the blood becoming too thin

□Alcohol causes a blockage of the blood vessels which in turn, slows blood flow to the

heart

□Alcohol influences the effect of the medication and this effects the clotting ability of

the blood

Answer the following questions to the best of your ability by checking the box next to the correct answer. PLEASE PROVIDE ONLY ONE ANSWER PER QUESTION.

---

7. **Atrial fibrillation is a rare condition.**

   □True

   □False

   □Don't know

8. **It is particularly risky if a person does not feel his/her atrial fibrillation.**

   □True

   □False

   □Don't know

9. **Which statement with regard to physical exercise is true of patients with atrial fibrillation?**

   □It is important for patients to rest in order to maintain normal heart activity

   □Patient with chronic atrial fibrillation cannot work fulltime

   □It is important to exercise normally within personal limitations

10. **Which statement is true?**

    □Atrial fibrillation is life endangering because it can result in a heart attack

    □Atrial fibrillation is completely harmless

□Atrial fibrillation is harmless if the right medication is taken

11. What is the function of the thrombosis center?

□To monitor blood clotting and the number of tablets taken each day

□To determine if the arrhythmia is present

□To determine if the patient needs to continue taking oral anticoagulation