

Older Adults at Risk for Atrial Fibrillation Lack Knowledge and Confidence to Seek Treatment for Signs and Symptoms

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Abstract

Early detection of atrial fibrillation (AF) is crucial for averting AF-related stroke and heart failure, but treatment is delayed when AF is not recognized. The critical need for early detection and treatment requires education to promote AF awareness. Knowledge deficits, attitudes, and beliefs about AF that should be addressed to improve awareness and reduce treatment-seeking delay in older adults at risk for developing AF have not been well documented. The purpose of this study was to describe knowledge, treatment-seeking attitudes, and beliefs about AF in adults ≥ 65 years old and identify demographic characteristics associated with knowledge, attitudes, and beliefs. Patients with no history of AF recruited from an academic medical center were interviewed using the Knowledge, Attitudes, and Beliefs about Atrial Fibrillation Survey. Data were analyzed using descriptive statistics and independent *t* tests. Participants ($N = 180$) were 63% male with a mean age of 73.7 ± 6.0 years, and 52% held ≥ 4 -year college degree. About one third could not identify common symptoms of AF including palpitations (31%), chest pain (36%), dyspnea (30%), and fatigue (35%). A majority (84%) lacked confidence to recognize AF, and 58% were not sure when they should seek care for AF symptoms. Nearly a third (32%) believed palpitations are always present with AF, and 74% believed that low energy would not be their only symptom of AF. Higher scores for AF Symptom Knowledge ($p = .02$) were observed in females, and General Knowledge about AF was greater for younger participants ($p < .001$). Participants lacked knowledge and confidence to aid decision-making for treatment-seeking for symptoms of AF and held inaccurate beliefs about AF that could hinder early treatment-seeking. Programs to promote AF awareness should explain the spectrum of symptoms that may be manifested by AF and include action plans for responding to symptoms.

Keywords

atrial fibrillation, early detection, treatment-seeking, knowledge, patient education

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Introduction

Early detection of atrial fibrillation (AF) is an international health care priority. Untreated AF is associated with a fivefold risk for thromboembolic stroke and is known to contribute to heart failure (HF; Kirchhof et al., 2016). Failure to detect AF represents a missed opportunity for individuals to receive critical treatment to reduce AF-related stroke and HF. The longer AF remains untreated, the more difficult it becomes to restore and maintain sinus rhythm (Kirchhof, 2009). As the population ages and more people are afflicted with comorbid conditions such as diabetes and obesity that promote development of AF, a

greater number of individuals will be at risk for living with undetected AF and AF-related complications (Ball, Carrington, McMurray, & Stewart, 2013).

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The critical need to detect AF early and the magnitude of individuals at risk for complications of undetected AF has recently led to interest in developing educational programs to foster awareness of AF and promote treatment-seeking for signs and symptoms of AF (American Heart Association, 2017a; Atrial Fibrillation Association, 2017; Heart Rhythm Society, 2011). However, the evidence to guide educational interventions is lacking. Knowledge deficits, attitudes, and beliefs about AF that might be modified to promote treatment-seeking in older adults at risk have not been well documented.

Review of Literature

What is known is that lack of knowledge about AF is widespread (Aliot et al., 2010). Early detection and treatment for AF is hindered when people do not recognize symptoms as requiring medical attention or do not experience symptoms when the condition is present. McCabe, Rhudy, Chamberlain, and DeVon (2016) documented that treatment-seeking delay is common in those experiencing symptoms of AF, discovering that 69% of participants delayed seeking treatment for weeks to months after symptom onset. Patients with AF reported that prior to diagnosis they had never heard of AF; did not recognize their symptoms such as fatigue, dyspnea, or transient palpitations as important; and did not seek evaluation until symptoms became severe enough to interfere with daily activities (McCabe, Rhudy, & DeVon, 2015).

Lane, Ponsford, Shelley, Sirpal, and Lip (2006) reported that 49% of participants diagnosed with AF could not identify their condition, and 46% were not aware that AF was a risk factor for stroke. Others reported that 29% (Desteghe et al., 2016) and 38% (Frewen et al., 2013) of participants who were diagnosed with AF were unaware of their diagnosis. Unrecognized AF is associated with increased morbidity and mortality (Dilaveris & Kennedy, 2017; Siontis et al., 2016). Compared to patients who were aware of their diagnosis, O'Neal et al. (2016) reported that patients who were not aware they had AF had a 94% increased risk for death. These findings spotlight the need for strategies to improve awareness of AF. Yet, there is a paucity of published literature about specific knowledge deficits, attitudes, and beliefs about AF in those at risk that need to be addressed in educational programs to promote AF awareness. The purpose of this cross-sectional descriptive study was to identify knowledge, attitudes, and beliefs about AF and treatment-seeking in older adults (≥ 65 years of age) who were diagnosed with ≥ 1 medical risk factor for developing AF and to determine if knowledge, attitudes, or beliefs about AF differ by age, sex, or level of educational attainment.

Methods

Study Design

A descriptive cross-sectional design was used.

Setting and Participants

This study was conducted at an academic medical center in the Midwestern United States. The convenience sample included patients who were recruited from a primary care clinic. Patients who were at least 65 years of age; had ≥ 1 documented medical risk factor for developing AF (e.g., hypertension, coronary artery disease [CAD], HF, obstructive sleep apnea, diabetes, or obesity [body mass index >30]); and had access to and ability to communicate by telephone were eligible to participate. Risk factors were validated in the medical record. Patients who had been diagnosed with AF (no matter how transient), those who had a cognitive deficit documented in the medical record, lived with someone diagnosed with AF, or reported having training or education that would expose them to knowledge about AF (health-care professional or paraprofessional) were excluded.

Instrument

The Knowledge, Attitudes, and Beliefs about Atrial Fibrillation Survey (KABAFS) was used to measure knowledge, attitudes, and beliefs about AF. This instrument was developed by the authors because no published instrument was available to measure these concepts. Leventhal's common sense model was the guiding framework for development of items for the KABAFS. Leventhal et al. (2012) proposed that when symptoms or an illness occur, individuals respond based on their beliefs about the symptom/s' or illness's cause, seriousness, timeline (chronic or transient), controllability (ability to self-manage vs. requiring professional management), and ability to identify the symptom/s as associated with a known condition. Thus, beliefs about the symptoms or illness influence treatment-seeking decisions and behaviors (Leventhal et al., 2012).

Items on the KABAFS were designed to assess knowledge deficits and inaccurate beliefs about AF and were based on findings from previous studies where participants reported treatment-seeking delay for symptoms of AF. Items for the Attitudes about Recognizing and Seeking Treatment for AF subscale were modifications (with permission) of items from an instrument to measure knowledge, attitudes, and beliefs about acute coronary syndrome (ACS; Riegel et al., 2007). The KABAFS is a 33-item survey that measures knowledge about symptoms related and not related to AF, general facts about AF, attitudes about recognizing AF and seeking

treatment, and beliefs about AF and responding to its' symptoms. The KABAFS was evaluated for content validity by nine experts (content validity index of .87) and cognitive interviews with six patients ≥ 65 years old who had ≥ 1 medical risk factor for developing AF. Features of the KABAFS are displayed in Table 1.

Procedures

This study was approved as a minimal risk study by the institutional review board (IRB) of the medical center. Records of primary care patients who had consented to review of their records for research purposes were screened for eligibility. Eligible patients were sent IRB-approved invitation letters explaining the purpose of the study and participant requirements. A form indicating interest in participating or declining participation was included with the invitation. Interested participants were asked to return the form and were contacted by telephone to arrange for face-to-face or telephone interview. Informed consent was obtained prior to the interview. Data collection interviews were conducted by one RN interviewer who was trained and supervised by the primary investigator.

Statistical Analysis

Descriptive statistics were used to describe mean scores and individual items on the KABAFS. Independent *t* tests were used to identify differences in mean KABAFS scores by age and sex, and one-way analysis of variance was used to identify differences by educational attainment grouped as graduate degree, 2- or 4-year college degree, and high school or less. Data were examined to assure that assumptions for the parametric tests

were met. In the absence of published studies describing knowledge, attitudes, and beliefs about AF in older adults *at risk* for developing AF, the sample size was based on previous studies that evaluated knowledge in patients with *diagnosed* AF where sample sizes ranged from 93 (Lane et al., 2006) to 200 (Koponen et al., 2007). The sample size of 180 provided .80 power to detect that differences in mean KABAFS scores for age, sex, and level of educational attainment were >0 . Level of significance was set at .05 for all statistical tests.

Results

Characteristics of the Sample

The sample was 63% male, 98% Caucasian with a mean age of 73.7 ± 6.0 years and range of 65 to 91 years. Participants were well educated with 52% holding a bachelor's or graduate degree.

Knowledge of Symptoms

A high proportion of participants were able to identify arrhythmia-related AF symptoms such as fast heartbeat (84%) and skipping beats (73%). About one third of participants did not recognize common symptoms of AF such as shortness of breath (30%) and decreased energy (35%). A majority of participants identified symptoms such as arm pain (71%) and arm numbness (67%) as symptoms of AF (Table 2).

General Knowledge About AF

Over one third of participants did not know that AF could occur in the absence of preexisting heart disease

Table 1. Features of the Knowledge, Attitudes, and Beliefs About Atrial Fibrillation Survey.

Subscale	Number of items	Example of item	Response	Possible score range	α
Knowledge of AF symptoms	8	Skipping heartbeats	Yes/no/unsure	0–8	.78
		Shortness of breath			
Knowledge of non-AF symptoms	6	Arm pain	Yes/no/unsure	0–6	.70
		Indigestion			
General knowledge about AF	5	People without heart disease are unlikely to get AF	Yes/no/unsure	0–5	.42
Attitudes about seeking treatment	5	How sure are you that you would know when to get help for symptoms of AF?	Not at all sure– Very sure	5–20	.72
Beliefs about AF and seeking treatment	9	I would be able to tell if I have AF only if I feel my heart beating fast and hard	Strongly disagree– Strongly agree	9–36	.62

Note. AF = Atrial fibrillation.

Table 2. Knowledge of AF and Non-AF Symptoms ($N = 180$).

Symptom of AF	Number (%) correct	Not a symptom of AF	Number (%) correct
Fast heartbeats	151 (84)	Indigestion	73 (41)
Skipping beats	132 (73)	Arm pain	52 (29)
Pounding heartbeat	124 (69)	Nausea	75 (42)
Shortness of breath	126 (70)	Arm numbness	60 (33)
Activity intolerance	120 (67)	Wheezing	91 (51)
Decreased energy	117 (65)	Coughing	93 (52)
Chest discomfort	116 (64)		
Lightheadedness	108 (60)		

Note. AF = atrial fibrillation.

(37%) and that hypertension was a risk factor for AF (37%). One quarter of participants did not know that untreated AF with symptoms that are not bothersome could lead to other serious health problems. Nearly a third (30%) did not know that even in the absence of diagnosed heart disease, episodes of rapid heartbeats and lightheadedness should be evaluated.

Attitudes About Recognizing AF and Seeking Treatment

A majority of participants lacked confidence that they could recognize symptoms of AF in themselves (74%) and could tell the difference between symptoms of AF and another medical condition (90%). More than half of the participants were not confident that they would know when to get help for symptoms of AF (59%) or would know which symptoms of AF require emergency care (75%).

Beliefs About AF and Seeking Treatment

A majority of participants agreed that it was important to seek evaluation for new shortness of breath, would be concerned about transient skipping or fast heartbeats, and would not delay seeking evaluation if they thought they were experiencing symptoms of AF. Nearly a third believed that if they were experiencing AF, it would be accompanied by feeling a rapid heartbeat and 74% doubted that low energy would be the only symptom they would experience if they had AF (Table 3).

Knowledge, Attitudes, and Beliefs About AF Survey Scores by Demographic Characteristics

We observed a higher mean General Knowledge about AF score in younger participants ($M, 3.36 \pm 1.0$ vs. $M, 2.48 \pm 1.5$, $t = 3.94$, $p = <.001$). Age was stratified as younger (65–74 years) and older (≥ 75 years). The AF

Table 3. Beliefs About Atrial Fibrillation and Symptoms ($N = 180$).

Item	Level of agreement	N (%)
If I have new shortness of breath, I would see my health-care provider	Strongly disagree	1 (0.6)
	Disagree	14 (8)
	Agree	108 (60)
	Strongly agree	57 (32)
I would be able to tell if I have AF only if I feel my heart beating fast and hard	Strongly disagree	11 (6)
	Disagree	112 (62)
	Agree	49 (27)
	Strongly agree	8 (4)
If I were to develop AF, I doubt that low energy would be my only symptom	Strongly disagree	1 (0.6)
	Disagree	46 (26)
	Agree	114 (63)
	Strongly agree	19 (11)
I would not be concerned if I had skipping heartbeats that would come and go	Strongly disagree	29 (16)
	Disagree	112 (62)
	Agree	36 (20)
	Strongly agree	3 (2)
I would not be concerned if I had a fast heartbeat that would go away when I rest	Strongly disagree	20 (11)
	Disagree	108 (60)
	Agree	51 (28)
	Strongly agree	1 (0.6)
If I thought I was having symptoms that could be from AF I would:		
• Wait until I was pretty sure they were really symptoms of AF before I went to see my health-care provider	Strongly disagree	30 (17)
	Disagree	110 (61)
	Agree	36 (20)
	Strongly agree	3 (2)
• Wait to see my provider until symptoms kept me from doing my normal activities	Strongly disagree	48 (27)
	Disagree	106 (59)
	Agree	25 (14)
	Strongly agree	1 (0.6)
• Talk first with a family member to help me decide if I should see my health-care provider	Strongly disagree	23 (13)
	Disagree	98 (54)
	Agree	50 (28)
	Strongly agree	9 (5)

Note. AF = atrial fibrillation.

Symptom Knowledge score was higher in females than males ($M, 5.34 \pm 1.6$ vs. $M, 4.52 \pm 2.2$, $t = 2.39$, $p = .02$). There were no other differences in AF Symptom Knowledge, Non-AF Symptom Knowledge, Attitudes, and Belief scores by age, sex, and educational attainment. See Table 4 for KABAFS scores for the total sample.

There were differences by age, sex, and educational attainment on single items in the scale. When compared with younger participants, older participants reported

Table 4. Knowledge, Attitude, and Beliefs About Atrial Fibrillation Scores ($N = 180$).

Subscale	<i>M</i>	<i>SD</i>	95% CI	Range	
				Potential	Actual
Knowledge of AF symptoms	4.88	2.1	[4.57, 5.18]	0–8	0–7.0
Knowledge of non-AF symptoms	2.47	1.9	[2.2, 2.75]	0–6	0–6.0
General knowledge about AF	3.06	1.3	[2.87, 3.25]	0–5	0–5.0
Attitudes toward treatment-seeking	10.36	3.2	[9.9, 10.83]	5–20	5–20.0
Beliefs about AF and treatment-seeking	24.95	2.8	[24.54, 25.37]	9–36	16–33.0

Note. AF = atrial fibrillation; CI = confidence interval.

they would be more concerned about the symptom of a skipping heart beat that comes and goes (M , 3.0 ± 0.63 vs. M , 2.8 ± 0.71 , $t = 2.3$, $p = .02$). A greater percentage of females compared to males correctly identified a rapid heartbeat (94.5% vs. 75%, $\chi^2 = 8.87$, $p = .003$) and pounding heartbeats (80% vs. 60%, $\chi^2 = 6.17$, $p = .01$) as symptoms of AF. Compared to females, males' mean score (lower score equals more agreement) reflected more agreement that they would wait to seek evaluation for AF symptoms until symptoms interfered with daily activities (M , 3.27 ± 0.62 vs. M , 3.0 ± 0.67 , $t = 2.06$, $p = .04$). In addition, if they thought they were having symptoms of AF, they would talk first with a family or friend to help them decide whether to see their health-care provider about the symptoms (M , 2.91 ± 0.80 vs. M , 2.63 ± 0.76 , $t = 2.08$, $p = .04$). A higher percentage of participants with a graduate education (87%) compared to associate or bachelor's degree holders (77%) and \leq high school education (56%) correctly identified that untreated AF, even when symptoms were not bothersome, can lead to other serious health problems ($\chi^2 = 9.82$, $p = .007$).

Discussion

Our study identified knowledge deficits and misperceptions about AF held by older adults who are at risk for developing AF. We found that a substantial portion of older adults lacked knowledge about AF and AF symptoms, were not confident they could recognize AF, and were unsure of when to seek treatment if they believed they had the condition. These data provide evidence to support the need to develop educational interventions to increase awareness of AF and equip individuals with the knowledge and skills to aid prompt treatment-seeking for signs and symptoms of AF.

Knowledge of Symptoms

Arrhythmia symptoms such as rapid heartbeats and skipping heartbeats were recognized by most participants as symptoms of AF. About one third of

participants did not recognize shortness of breath and fatigue as symptoms of AF; symptoms that in the professional literature are commonly attributed to AF (Rienstra et al., 2012). Findings from the current study are similar to reports from previous studies of participants with recently diagnosed AF who delayed treatment-seeking because they attributed gradually progressing shortness of breath and fatigue to factors such as deconditioning, inadequate sleep, or normal aging that they did not believe warranted medical attention (McCabe, Chamberlain, Rhudy, & DeVon, 2016; McCabe et al., 2015). These data reflect lack of knowledge about the range of AF symptoms including those that might be considered noncardiac. Investigations of treatment-seeking delay for symptoms of myocardial infarction (MI) or ACS revealed similar responses to symptoms perceived as noncardiac. Individuals delayed when they did not experience the typical chest pain they expected would occur with an MI (Burnett, Blumenthal, Mark, Leimberger, & Califf, 1995; Dracup & Moser, 1997; Moser et al., 2007). In a study of knowledge, attitudes and beliefs about ACS in participants with a prior ACS event, O'Brien, O'Donnell, McKee, Mooney, and Moser (2013) reported that more than half were unable to recognize less common symptoms (jaw pain, indigestion, neck pain) as symptoms of ACS. These findings spurred efforts to increase recognition of the breadth of symptoms that could be experienced with MI or ACS (American Heart Association, 2014; Caldwell & Miaskowski, 2002). Likewise, educational interventions to increase recognition of AF must convey that AF may manifest with vague symptoms such as shortness of breath or fatigue, without arrhythmia symptoms, or may not produce any symptoms at all.

General Knowledge About AF

Responses to true-false items revealed that 25% to 37% of participants lacked knowledge that is important for identifying personal risks for developing AF. Hypertension is the most common medical risk factor for AF and increases the risk of developing AF 7-fold

in persons age 65 to 74 years and 15-fold in those ≥ 75 years old (Chyou, Hunter, Mollenkopf, Turakia, & Reynolds, 2015). The importance of educating people to recognize hypertension as a risk factor for stroke or CAD is promoted by the American Heart Association (2017b); yet, guidelines for the treatment of AF do not address the practice of discussing this risk with hypertensive patients (January et al., 2014). Considering that globally, 502 million individuals over 60 years of age have been diagnosed with hypertension (Mills et al., 2016), it is critical to convey the message that older age and hypertension substantially increase the risk for developing AF.

Over one third (37%) of participants did not know that AF could occur in the absence of other preexisting cardiac disease. This knowledge deficit was also present in participants with recently detected AF who delayed treatment-seeking. Participants reported that because they believed they had a healthy heart they were not vulnerable to developing a heart rhythm disorder and therefore did not seek evaluation for transient episodes of fast heart beats or lightheadedness (McCabe et al., 2015). This knowledge deficit is important to address in programs to promote awareness of AF because older age, even in the absence of other cardiovascular conditions, increases the risk of developing AF by 1.3% for those 65 to 74 years of age. This age-related risk more than doubles (3.2%) for or those ≥ 75 years making age ≥ 75 years the most potent single risk factor for developing AF (Chyou et al., 2015).

Of particular concern is that 25% of the total sample and 44% of those with a high school education or less did not know that untreated AF even if symptoms are not bothersome can lead to complications. This finding has implications for education because about one third of patients do not experience symptoms prior to their AF diagnosis (Dilaveris & Kennedy, 2017). People should be informed that symptoms perceived as tolerable and not bothersome or the absence of symptoms do not portend a lower risk for AF-related stroke (Kirchhof et al., 2016). After adjustment for age and stroke risk, compared to those with new onset AF who experience palpitations, those who have nonpalpitation symptoms and those who are asymptomatic have 3.5 and 2.7-fold higher risk for cerebrovascular events, respectively (Siontis et al., 2016). Asymptomatic untreated AF is discovered incidentally in about one-quarter of patients admitted for stroke and is associated with HF induced by the persistent rapid ventricular response to AF (Savelieva & Camm, 2000).

Attitudes Toward Recognizing AF and Treatment-Seeking

The majority of participants were not confident that they would be able to recognize symptoms of AF in themselves and were not sure they would know when to

seek help for AF. This lack of confidence was associated with lack of knowledge about AF symptoms ($r = .31$, $p < .001$). This finding is consistent with Leventhal's common sense model that proposes that treatment-seeking for symptoms is influenced by the schema or meaning attached to the symptom/s and the presence of and action plan to manage the symptom/s (Leventhal et al., 2012). The low level of confidence regarding knowing when to seek help for AF symptoms demonstrates the importance of including both recognition of signs and symptoms of AF and action planning in response to signs and symptoms as important elements of educational programs to improve treatment-seeking.

Beliefs About AF and Seeking Treatment

It is encouraging that participants' scores reflected recognition of the need for evaluation of new shortness of breath, concern for skipping heartbeats that come and go, transient fast heartbeats, and the belief that they would not wait to seek medical attention until AF symptoms interfered with daily activities. These findings may reflect the characteristics of participants in this particular setting who have an assigned primary care provider, were able to access care, and whose high level of educational attainment may not be representative of the population of older adults who are at risk for developing AF. Nevertheless, a substantial portion of participants held inaccurate beliefs about AF that could hinder treatment-seeking. The expectation that AF is usually accompanied by a fast and hard heartbeat and the belief that fatigue would not be the only symptom experienced with AF indicates a need to inform individuals about the manner in which AF may present and the fact that it may occur without obvious cardiac-related symptoms.

About one third of participants reported that they would consult with family members before seeking evaluation if they thought they might have AF. There is little data to determine the influence of consultation from others on treatment-seeking delay for symptoms of AF. Although in studies of treatment-seeking delay for MI, consulting family members was associated with delayed treatment (Moser et al., 2007), one study conducted to examine factors associated with delay in seeking treatment for AF symptoms documented that consulting family members was not associated with delay (McCabe et al., 2016). Additional studies are needed to elucidate the influence of consulting with others on treatment-seeking for AF.

Association of Demographic Characteristics With Knowledge, Attitudes, and Beliefs

There is little to no information about the associations of demographic characteristics and knowledge, beliefs, and

attitudes about AF in older adults at risk for developing AF. Frewen et al. (2013) reported that those with a lower level of educational attainment were less likely to be aware of their AF diagnosis. Our findings that knowledge of AF symptoms was greater in females compared to males and general knowledge of AF was higher in participants under 75 years old provide preliminary findings that should be compared to knowledge generated in future studies. It is too early to draw conclusions that would influence how educational programs can be designed to target particular demographic groups. More research is needed to determine if demographic characteristics related to knowledge in patients at risk for AF are the same as those in patients already diagnosed with the condition, namely younger age (Koponen et al., 2007; McCabe, Schad, Hampton, & Holland, 2008), higher education (McCabe et al., 2008), and male sex (Koponen et al., 2007).

Limitations

The generalizability of our findings is limited by data collection at a single site with a homogeneous population lacking diversity. The high level of educational attainment of our sample may have influenced responses. The KABAFS was determined to have content validity, and three of the five subscales demonstrated acceptable internal consistency reliability for a new instrument. However, the low internal consistency reliability of the General Knowledge about AF and Beliefs subscales that were observed in this sample should be considered when interpreting the results.

Implications for Practice

Our findings raise important implications for practice. Even in this well-educated sample, in about one third of the sample, we documented knowledge deficits and inaccurate beliefs that could hinder treatment-seeking. Given the magnitude of people who are at risk for developing AF and AF-related complications, adults ≥ 65 years should receive counseling about their risk for AF when they are counseled about their risk for CAD and stroke. Patient education to improve AF awareness can occur in multiple venues (inpatient, primary care, sleep disorder clinics, cardiac rehabilitation programs, Welcome to Medicare preventive visits). Information about AF should contain information about (a) risk factors for developing AF with emphasis that older age alone is a potent risk factor, (b) how to recognize signs (irregular pulse) and symptoms of AF, and (c) action planning for how to respond to symptoms or an irregular pulse. Health fairs and community events that feature screening and information about high blood and lipid status could include information to improve awareness and

recognition of AF. The value of public service announcements such as those used to address delays in treatment-seeking for MI and stroke needs to be evaluated.

Summary

This is the first study to describe knowledge, attitudes, and beliefs about AF in older adults at risk for developing AF. The findings are encouraging in that participants' knowledge of arrhythmia symptoms of AF was high, the majority recognized that untreated AF could lead to serious health problems, and beliefs reflected agreement that they would seek treatment if AF was suspected. Yet, even in this highly educated sample, participants lacked knowledge about the range of AF symptoms, were unable to recognize symptoms not related to AF, were unaware that older age alone increases the risk for AF, and lacked confidence for being able to recognize and seek help for AF. Educational programs to improve AF awareness should include content that alerts people to the common risks for AF, explains the range of AF symptoms, and provides direction for recognizing and responding to signs and symptoms of AF.

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References

- Aliot, E., Breithart, G., Brugada, J., Camm, J., Lip, G. Y., Vardas, P.E., Wagner, M., ... World Heart Federation. (2010) An international survey of physician and patient understanding, perception, and attitudes to atrial fibrillation and its contribution to cardiovascular disease morbidity, and mortality. *Europace*, 12(12), 626–633.
- American Heart Association. (2014). *Symptoms and diagnosis of a heart attack*. Retrieved from http://www.heart.org/HEARTORG/Conditions/HeartAttack/Symptoms-Diagnosis-of-Heart-Attack_UCM_002041_Article.jsp

- American Heart Association. (2017a). *Afib-awareness*. Retrieved from http://www.heart.org/HEARTORG/Conditions/Arrhythmia/AFib-Awareness_UCM_476637_SubHomePage.jsp
- American Heart Association. (2017b). *Learn how high blood pressure can harm your health*. Retrieved from http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/LearnHowHBPHarmsYourHealth/Health-Threats-From-High-Blood-Pressure_UCM_002051_Article.jsp#.WMLcytgzXIU
- Atrial Fibrillation Association. (2017). *Know your pulse campaign*. Retrieved from <http://www.heartrhythmalliance.org/afa/uk/about-the-know-your-pulse-campaign>
- Ball, J., Carrington, M. J., McMurray, J. J., & Stewart, S. (2013). Atrial fibrillation: Profile and burden of an evolving epidemic in the 21st century. *International Journal of Cardiology*, 167(5), 1807–1824. doi:10.1016/j.ijcard.2012.12.093.
- Burnett, R. E., Blumenthal, J. A., Mark, D. B., Leimberger, J. D., & Califf, R. M. (1995). Distinguishing between early and late responders to symptoms of acute myocardial infarction. *American Journal of Cardiology*, 75, 1019–1022.
- Caldwell, M. A., & Miaskowski, C. (2002). Mass media interventions to reduce help-seeking delay in people with symptoms of acute myocardial infarction: Time for a new approach? *Patient Education and Counseling*, 46, 1–9.
- Chyou, J. Y., Hunter, T. D., Mollenkopf, S. A., Turakhia, M. P., & Reynolds, M. R. (2015). Individual and combined risk factors for incident atrial fibrillation and incident stroke: An analysis of 3 million at-risk US patients. *Journal of the American Heart Association*, 4, e001723. doi:10.1161/JAHA.114.001723.
- Desteghe, L., Engelhard, L., Raymaekers, Z., Kluts, K., Vijgen, J., Dilling-Boer, D., . . . , Heidbuchel, H. (2016). Knowledge gaps in patients with atrial fibrillation revealed by a new validated knowledge questionnaire. *International Journal of Cardiology*, 223, 906–914. doi:10.1016/j.ijcard.2016.08.303.
- Dilaveris, P. E., & Kennedy, H. L. (2017). Silent atrial fibrillation: Epidemiology, diagnosis, and clinical impact. *Clinical Cardiology*. Advance online publication. doi:10.1002/clc.22667.
- Dracup, K., & Moser, D. K. (1997). Beyond sociodemographics: Factors influencing decision to seek treatment for symptoms of acute myocardial infarction. *Heart and Lung*, 26, 253–262.
- Frewen, J., Finucane, C., Cronin, H., Rice, C., Kearney, P. M., Harbison, J., & Kenny, R. A. (2013). Factors that influence awareness and treatment of atrial fibrillation in older adults. *QJM*, 106(5), 415–424. doi:10.1093/qjmed/hct060.
- Heart Rhythm Society. (2011). *AFib feels like*. Retrieved from <http://www.hrsonline.org/News/Atrial-Fibrillation-AFib-Awareness/AFib-PSA#axzz2LHdBhyxn>
- January, C. T., Wann, L. S., Alpert, J. S., Calkins, H., Cleveland, J. C. Jr., Cigarroa, J. E., . . . , Yancy, C. W. (2014). 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: Executive summary: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the Heart Rhythm Society. *Circulation*, 130(23), 2071–2104. doi:10.1161/cir.0000000000000040.
- Kirchhof, P. (2009). Can we improve outcomes in AF patients by early therapy? *BMC Medicine*, 7, 72. doi:10.1186/1741-7015-7-72.
- Kirchhof, P., Benussi, S., Kotecha, D., Ahlsson, A., Atar, D., Casadei, B., . . . , Vardas, P. (2016). 2016 ESC guidelines for the management of atrial fibrillation developed in collaboration with EACTS: The Task Force for the management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC Endorsed by the European Stroke Organisation (ESO). *Europace*, 18(11), 1609–1678. doi:10.1093/europace/euw295
- Koponen, L., Rekola, L., Ruotsalainen, T., Lehto, M., Lein-Kilpi, H., & Voipio-Pulkki, L. M. (2007). 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. (2006). Patient knowledge and perceptions of atrial fibrillation and anticoagulant therapy: Effects of an educational intervention programme. The West Birmingham Atrial Fibrillation Project. *International Journal of Cardiology*, 110, 354–358.
- Leventhal, H., Bodnar-Deren, S., Breland, J. Y., Hash-Converse, J., Phillips, L. A., & Leventhal, E. A. (2012). Modeling health and illness behavior. The approach of the common sense model. In A. Baum, T. A. Revenson & J. Singer (Eds.), *Handbook of health psychology* (2nd ed., pp. 3–25). New York, NY: Psychology Press.
- McCabe, P. J., Chamberlain, A., Rhudy, L., & DeVon, H. A. (2016). Symptom representation and treatment-seeking prior to diagnosis of atrial fibrillation. *Western Journal of Nursing Research*, 38, 200–215. doi:10.1177/0193945915570368.
- McCabe, P. J., Rhudy, L., & DeVon, H. A. (2015). Patients' experiences from symptom onset to initial treatment for atrial fibrillation. *Journal of Clinical Nursing*, 5–6, 786–796. doi:10.1111/jocn.12708.
- McCabe, P. J., Rhudy, L. M., Chamberlain, A. M., & DeVon, H. A. (2016). Fatigue, dyspnea, and intermittent symptoms are associated with treatment-seeking delay for symptoms of atrial fibrillation before diagnosis. *European Journal of Cardiovascular Nursing*, 15(6), 459–468. doi:10.1177/1474515115603901.
- McCabe, P. J., Schad, S., Hampton, A., & Holland, D. E. (2008). Knowledge and self-management behaviors of patients with recently detected atrial fibrillation. *Heart Lung*, 37(2), 79–90. doi:10.1016/j.hrtlng.2007.02.006.
- Mills, K. T., Bundy, J. D., Kelly, T. N., Reed, J. E., Kearney, P. M., Reynolds, K., . . . , He, J. (2016). Global disparities of hypertension prevalence and control: A systematic analysis of population-based studies from 90 countries. *Circulation*, 134(6), 441–450. doi:10.1161/CIRCULATIONAHA.115.018912.
- Moser, D. K., Kimble, L. P., Alberts, M. J., Alonzo, A., Croft, J. B., Dracup, K., . . . American Heart Association Council on Cardiovascular Nursing and Stroke Council. (2007). Reducing delay in seeking treatment by patients with acute coronary syndrome and stroke: A scientific statement

- from the American Heart Association Council on Cardiovascular Nursing and Stroke Council. *Journal of Cardiovascular Nursing*, 22(4), 326–343. doi:10.1097/01.JCN.0000278963.28619.4a.
- O'Brien, F., O'Donnell, S., McKee, G., Mooney, M., & Moser, D. (2013). Knowledge, attitudes, and beliefs about acute coronary syndrome in patients diagnosed with ACS: An Irish cross-sectional study. *European Journal of Cardiovascular Nursing*, 12(2), 201–208.
- O'Neal, W. T., Efird, J. T., Judd, S. E., McClure, L. A., Howard, V. J., Howard, G., & Soliman, E. Z. (2016). Impact of awareness and patterns of nonhospitalized atrial fibrillation on the risk of mortality: The reasons for geographic and racial differences in stroke (REGARDS) study. *Clinical Cardiology*, 39(2), 103–110. doi:10.1002/clc.22501.
- Riegel, B., McKinley, S., Moser, D. K., Meischke, H., Doering, L., & Dracup, K. (2007). Psychometric testing of the Acute Coronary Syndrome (ACS) Response Index. *Research in Nursing and Health*, 30(6), 584–594.
- Rienstra, M., Lubitz, S., Mahida, S., Magnani, J. W., Fonte, J., Sinner, M., . . . Benjamin, E. J. (2012). Symptoms and functional status of patients with atrial fibrillation. *Circulation*, 125, 2933–2943. doi:10.1161/circulationaha.111.069450.
- Savelieva, I., & Camm, A. J. (2000). Clinical relevance of silent atrial fibrillation: Prevalence, prognosis, quality of life, and management. *Journal of Interventional Cardiac Electrophysiology*, 4(2), 369–382.
- Siontis, K. C., Gersh, B. J., Killian, J. M., Noseworthy, P. A., McCabe, P. J., Weston, S. A., . . . Chamberlain, A. M. (2016). Typical, atypical, and asymptomatic presentations of new-onset atrial fibrillation in the community: Characteristics and prognostic implications. *Heart Rhythm*, 13(7), 1418–1424.