

To explore Nurses' Knowledge of Patient's Stroke Risk in relation to Atrial Fibrillation and Anticoagulation use in Preventing Stroke.

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Declaration

I hereby declare this work is entirely my own and that I have acknowledged the writings, ideas and work of others. Furthermore, I have not knowingly allowed another to copy my work.

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Abstract

This study uses a qualitative descriptive methodology to explore nurses' knowledge of stroke risk in the setting of atrial fibrillation diagnosis and anticoagulation use. The study explored nurses' current knowledge of atrial fibrillation, their awareness of the stroke risk associated with atrial fibrillation, the use of risk assessment tools, and the use of anticoagulant medication.

Purposeful sampling was employed (N=5), data was collected via semi-structured interviews with nurses working in the Acute Medical Assessment Unit (AMAU), data was analysed using thematic analysis. Findings from the study showed that the nurses had a basic knowledge of atrial fibrillation and the stroke risk associated with it, they also recognised the need for anticoagulant therapy to reduce the risk of a person having an ischaemic stroke in the setting of atrial fibrillation. However, this study also highlighted the differences in both nursing practice when carrying out nursing assessment of patients presenting to AMAU, in relation to manual pulse checks as a method of opportunistic screening, and also a deficit in ability to interpret ECG recordings with an overreliance on electronic devices.

All nurses were keen to seek further education and training in relation to the use of stroke risk assessment tools in the setting of atrial fibrillation, ECG interpretation and increase awareness of the new direct oral anticoagulants. This study has implications for nurses to incorporate opportunistic screening for atrial fibrillation into their daily nursing practice and become efficient in ECG interpretation.

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Chapter 1 - Introduction

Atrial Fibrillation (AF) is the most common cardiac arrhythmia and, if left untreated is a significant risk factor for stroke and heart failure (Howlett, 2015). AF is an age related condition, the highest percentage of those diagnosed are over the age of 65 years (National Collaborating Centre for Chronic Conditions, 2006). This chapter provides details on: atrial fibrillation pathophysiology, the incidence and prevalence of AF, the stroke risk associated with AF, the nurse's role in the assessment of AF, the nursing process and the rationale for this study.

Atrial Fibrillation – Pathophysiology

Cardiac cells are capable of self-stimulation which is protective if the hearts conduction system fails, but it can also cause ectopic activity in the cardiac cells resulting in AF. In AF, multiple atrial cells self-stimulate acting like individual pacemakers, often sending out three to five hundred signals per minute. At these rates normal atrial contractions are replaced by rapid quivering movements resulting in ineffective atrial contractions. This lack of coordinated atrial contraction leads to two of the most common complications of AF, thrombus formation and heart failure (Cutungo, 2015).

Thromboembolism is one of the most important complications of AF, thrombi formation occurs on the atrial walls and within the left atrial appendage. Blood stasis, particularly in the atrial appendage occurs when blood pools due to ineffective emptying of the atria leading to thrombus formation, thrombi dislodge and enter the circulation system causing strokes and other systemic thromboemboli (Cutungo, 2015; Iwasaki et al. 2011).

Incidence and Prevalence of AF

In 2014, it was estimated that the prevalence of AF in the general population of Europe ranged from 1.9% to almost 3%, more than double than what was reported ten years earlier. However, despite the reported increase, the real prevalence of AF is probably underestimated as many cases of AF remain undetected due to the absence of symptoms (Zoni-Berisso et al., 2014).

One in four middle-aged adults in Europe and the US will develop AF (Heeringa et al., 2006; Llyod-Jones et al., 2004). It is anticipated by 2030, there will be 14–17 million AF patients in the European Union, with 120 000–215 000 newly diagnosed patients per year (Colilla et al., 2013; Krijthe et al., 2013; Zoni-Berisso et al., 2014).

Data from the Irish Longitudinal Study on Ageing (TILDA) estimate the prevalence of AF in 3.2% of the total population aged over 50, 5.3% in the over 65's and almost 11% in those aged over 80 years of age (Finucane et al., 2011).

In a study conducted by Smyth et al., in 2015 (Atrial fibrillation screening in General Practice in rural Ireland). This was a multi-site prospective study a partnership between primary and secondary care based in three counties in the West of Ireland. All GP's in the Galway and Sligo/Leitrim were invited to participate in the study, to carry out a pulse check as opportunistic screening for AF in patients aged over 65 years who presented to the practice over a six-month period. Forty-five GP practices were involved which saw 7,262 patients over 65 years were screened for AF in the six months from the 1st January to 30th June 2014. The prevalence of AF in the study population during the study was 10.9% or 220/1,000 over 65 years. This is a higher prevalence than what was found in the TILDA study which reported a prevalence rate of 5.3% (Smyth et al., 2015).

AF in an ageing population.

The number of patients with AF is predicted to rise steeply in the coming years. Health care providers will need to be prepared to meet the growing demand for effective care of patients with AF, with a need for comprehensive AF prevention and management strategies (Lane et al., 2017).

In Ireland, the population aged 65 years and over is increasing at the rate of 4% annually (CSO, 2013). The increase in the number of people over the age of 65 is approaching 20,000 persons a year and those aged over 65 will almost double over the next 20 years (DOH, 2016). While there is currently minimal growth in the overall population, the numbers, as well as the proportion of the population in the older age groups, is increasing rapidly. An ageing population clearly has major implications for the planning and provision of health services (DOH, 2016).

Recognition of AF

Although AF can occur asymptotically, two-thirds of people experience symptoms and can be affected to varying degrees. The most common symptoms of AF are fatigue and palpitations. AF can also be manifested in patients in various ways: palpitations, hypotension, dyspnoea, syncope or heart failure (Nabauer et al., 2009).

It is also important to recognise that AF occurs in people with underlying heart conditions associated with hypertension, coronary heart disease, cardiomyopathies, valvular heart disease and heart failure which all can increase left atrium size (January et al., 2014).

Other risk factors for AF include hyperthyroidism, diabetes mellitus, obesity, obstructive sleep apnoea, and tobacco, alcohol and drug use (January et al., 2014).

Recognising people who are at risk and screening for AF is vitally important, as people who have asymptomatic AF remain undetected, leaving them exposed to severe complications,

as stroke risk remains the same whether or not the person is symptomatic (Holding et al., 2013).

Complication of AF - Stroke

It is estimated that 20% of all strokes occur in the setting of AF and, in those aged over 80 years, this rate increases to 25%. In Ireland, of the 8000 people hospitalised following a stroke each year, AF is responsible for a third of these strokes (McElwaine et al., 2016).

Data from various countries has shown that both untreated and unknown or under treated AF is responsible for approximately one third of all ischaemic strokes recorded (Freedman et al., 2016).

If AF is left untreated, it can lead to heart failure and it is associated with a fivefold increase risk of stroke (Wolf et al., 1991; Kannel et al., 1998; Holding et al., 2013). A stroke resulting from AF is likely to be more severe than non-AF related stroke (Miller et al., 2005). Ischaemic strokes related to AF are associated with higher death rates, greater disability and increased health service costs (Freedman et al., 2016; Stewart et al., 2004)

Cardioembolism due to AF accounts for approximately one in six strokes. With improved detection rates and increased use of anticoagulant therapy many of these strokes are preventable (Marini et al., 2005; Yaghi & Hooman 2017).

Yet despite high risk of stroke associated with AF, anticoagulation is still underused in the prevention of stroke (Cowan et al., 2013; Ogilvie et al., 2010; Frankel et al., 2015).

Freedman et al. (2016) suggest that in order to reduce the burden of stroke associated with AF, several steps need to be introduced. The first step is to recognise the risk of stroke in patients diagnosed with AF and carry out a risk assessment using recognised scoring tools. Secondly, rather than waiting for stroke to be the first clinical manifestation, a system needs to be put in place to recognise those at risk of developing AF. Thirdly, optimum treatment

measures are required ensuring that anticoagulant medication is prescribed and that patients understand the need to adhere to and persist with long-term, life-long treatment.

AF – The Nurses Role

As AF is associated with increased risk of death, stroke, heart failure, hospitalisations and reduced quality of life (Camm et al., 2010), there is a need for an increase in the detection rates and to improve the management of AF related complications.

It is important that nurses are aware of the signs and symptoms of AF. Nurses should be involved in the screening and know the importance of onward referral for timely assessment and treatment (Shorten, 2014; Holding et al., 2013).

The recently published NICE guidelines on AF management 2014, highlights that one of the main aims of treatment is to prevent complications in AF, particularly stroke, with drug treatments including anticoagulants to reduce the risk of stroke (NICE, 2014).

The NICE guidelines on AF also highlighted the need to improve detection and management of AF and also the need to educate and support patients to understand the condition, the treatment options and ongoing monitoring needs.

Patients lack of knowledge of the risks associated with AF, their understanding of the disease, the drug treatments used to prevent complications and not being aware that they had a medical condition named 'Atrial Fibrillation' has been highlighted in research, (Desteghe et al., 2017; Aliot et al., 2010; Frankel et al., 2015 and Dearborn et al., 2009).

Kaufman et al., (2017) in their study, found that patients' perceived understanding of AF and the therapeutic options were suboptimal when AF was first diagnosed and remained so at a 6six month follow up.

Nurses can play a vital role in this area of patient care, but they need to be equipped with the knowledge, education and ability to provide appropriate education, support and intervention when required (Shorten, 2014).

Assessment and diagnosis Nurses role

The diagnosis of AF remains a challenge, however, the introduction of simple screening methods may help to improve detection rates of AF and help those at risk. Nurses are well placed to provide screening to patients. One way to improve the detection of AF is to identify opportunities during clinical practice where screening can occur. Simply adding a manual pulse check when carrying out vital sign measurements is one such measure.

Identifying 'at risk' patients and providing both opportunistic manual pulse checks and ECG recording for those deemed high risk – people aged 65 and over and also to those that have identified comorbidities for AF (Cottrell, 2011).

Opportunistic screening has been demonstrated to be an effective approach (Fitzmaurice et al., 2007; Smyth et al., 2015). The European Society of Cardiology Guidelines for the management of atrial fibrillation has recommended opportunistic screening to detect AF in all people aged 65 years and over by taking their pulse and carrying out an ECG (Camm et al., 2012). The nurses role in this area is paramount to improving outcomes for patients with AF.

Nursing Process for AF

The nursing process is an essential component of nursing practice that unites different types of nurses who work in varied areas of nursing enabling them to provide holistic patient-focused care. The nursing process has been described as 'a systematic, problem-solving approach to care' (Chalmers, 1989), and can be broken down into five separate steps – assessment, diagnosing, planning, implementation and evaluation (Capers & Kelly 1987).

If the current emphasis of AF is the prevention of stroke, it is essential that nurses are proficient in the identification of AF. The nurse's ability to make an early and accurate nursing diagnosis of AF allows for early treatment and intervention. It allows the nurse to incorporate strategies when spending intensive contact time with the patient, to introduce risk factor profiling and opportunistic screening for AF into the nursing care plan.

The nursing process involves the problem-solving processes of data collection to assess, plan, intervene and evaluate in a systematic way for the purpose of reducing and preventing health related problems and promoting the patient's adaption to those problems (Aspinall & Tanner 1981). In addition, when nurses use theory and evidence-based medicine to structure their practice, Younas & Sommer (2015) suggest it improves the quality of nursing care provided to the patients.

Rationale of the Study

AF has significant implications for our health care system, for health care providers and for patients. AF poses a major public health burden due to its increased morbidity and mortality associated with stroke. The cost of caring for patients with stroke associated with AF is significantly higher than for those whose stroke was not AF related (Bajpai et al., 2007), the direct costs per patients with a stroke associated with AF are 33% greater than the costs for stroke not associated with AF (Santos et al., 2017).

The lifetime risk of developing AF from the age of forty onwards is approximately one in four (Llyod-Jones et al., 2004), by 2030 there will be 14–17 million AF patients in the European Union (Zoni-Berisso et al., 2014). More efficient ways of dealing with AF and improving the delivery of care for patients with AF is needed.

Nurses require an increased understanding and knowledge of AF in order to correctly identify those at risk and prompt referral. This knowledge is required to educate patients

about AF, the risk factors associated with it, the various treatment options available and adherence to prescribed treatments.

Aims of the study

To explore Nurses knowledge of patients, stroke risk in relation to atrial fibrillation and anticoagulation use in preventing stroke.

Study Objectives

- To explore nurses' current knowledge level of AF.
- To assess nurses' awareness and knowledge in relation to;
 - the use of stroke risk assessment tools in the setting of AF
 - anticoagulation use in preventing stroke in the setting of AF
- To identify what nurses may see as potential barriers or facilitators to the implementation of opportunistic screening for AF in their working processes/practices.

Chapter 2 - Literature review

Introduction

A literature review involves the systematic identification, location, and analysis of documents containing information related to the research problem, the main purpose of reviewing the literature is to determine what has already been done that relates to your topic (Gay et al., 2006).

For the purpose of this study a literature review was conducted to give the author the understanding and insight needed in order to explore nurses' knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulation use in preventing stroke. It allowed the researcher to place the topic within a logical frame and provided the rationale for my research approach and design.

A qualitative research approach was chosen to explore this area of nurses' knowledge this approach will be discussed in detail in chapter 3. Disagreement exists among qualitative researchers about the role of the literature review in the research process, some qualitative researchers have argued that reviewing the literature curtails inductive analysis and should be avoided at the early stages of the research process, some qualitative researchers will not delve deeply into their literature until their topic has emerged over time (Gay et al., 2006).

Others suggest that the review of related literature is important early in the qualitative research process because it allows the researcher to be aware of the underlying assumptions behind the research questions that are central to the research proposal, it provides the researcher with an opportunity to identify any gaps that may exist and it allows the researcher to refine the research questions (Gay et al., 2006).

Literature search method

The researcher carried out a review of the literature regarding nurses' knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulation use in preventing stroke, at the start of the research process in preparation for the research study and carried out an ongoing review of the literature throughout the study.

A thorough literature search was performed using the following electronic databases: CINAHL (Cumulative Index to Nursing and Allied Health Literature), EBSCO Nursing, the Cochrane Library, Pubmed, Medline, Scopus and Google. Searches were limited to previous 15 years 2005-2018 and to the English language. Combinations of the following search terms: nurse's knowledge or understanding or views or barriers; atrial fibrillation or A fib or AF; stroke or ischaemic stroke or cerebral vascular accident or CVA or stroke risk; anticoagulation. A hand search of the reference list from full text articles was also undertaken. Suitable studies identified were research based, published in peer reviewed journals and had a specific focus on atrial fibrillation and stroke prevention.

A large number of research papers were found in the original searches, which was narrowed down using Boolean operator AND and OR, to yield a final number of thirty-four studies which were deemed relevant to this study. However, review of the literature related specifically to the nurses' knowledge of patients with AF and stroke risk revealed only three published studies on the topic, highlighting a gap in the knowledge and a lack of research looking specifically at nurses' knowledge in relation to AF, stroke and anticoagulation, it also highlights the importance of this current study.

These studies that were reviewed using the critical appraisal skills programme tools for assessing and appraising research studies and the findings from these studies and others

that were not specifically related to nurses' knowledge will be presented under the themes of;

- nurses' knowledge of AF and anticoagulation
- educational needs of patients with AF
- knowledge of and adherence to anticoagulation
- opportunistic screening

Nurses knowledge of AF and Anticoagulation

AF is highly prevalent in our ageing population, so it is encountered in many healthcare settings. The early detection, diagnosis and treatment of AF is extremely important to reduce the risk of stroke associated with it. It is paramount that nurses, who are the frontline of many health care services, have a sound understanding of AF and its management in order to be able to diagnose and manage a patient appropriately. However, research indicates that nurses need to improve their knowledge and practice in relation to AF and anticoagulation (Ferguson et al., 2016; Oterhals et al., 2014).

Ferguson et al., (2016) carried out a quantitative paper based survey on current practices and knowledge of AF and anticoagulation of cardiovascular nurses in Australia and New Zealand. The aims of the study were to explore the nurse's role in clinical decision making in anticoagulation the setting of AF, describe the perceived barriers to anticoagulation in AF the practice patterns in the management of AF and assess cardiovascular nurses' knowledge of AF. A validated paper-based self-report questionnaire/ survey was distributed to attendees at a conference, it was also electronically distributed to nursing members of the Cardiac Society of Australia and New Zealand and via a state-wide cardiovascular research nurse email distribution list, nurses working in a CCU unit close to where the researchers

were based were also invited to participate in the survey. A total number of 55 responses were included in the analysis out of 458 surveys distributed, giving a response rate of 12%, a limitation of this study, the demographic of the respondents showed that they were typically older and a more experienced cardiovascular nursing population working in a more specialised positions, therefore may not be representative of the general cardiovascular nursing population who have more hands on and bedside time with patients.

The findings of this study were consistent with international research; underuse of the risk stratification tools CHADS-Vasc and HASBLED, barriers to anticoagulation use included fears of patients falling, poor adherence to medication and routine monitoring in relation to warfarin use. The results also demonstrated that of the nurses surveyed in Australia and New Zealand, most had inadequate knowledge of oral anticoagulation and highlighted a lack of knowledge on topics of lifestyle, medication and food interactions to oral anticoagulation, it showed that there is scope for improvement in the practice of shared decision-making and patient-centred care and that nurses maintain an active role in the decision-making process and act as an advocate for both patients and caregivers.

It is vitally important that nurses are knowledgeable and keep up to date with new information related to AF and anticoagulation as nurses are best placed to provide ongoing education, counselling and to ensure a high quality of care for patients throughout the spectrum of care from hospitalisation to discharge and within the primary care setting. The research highlighted the need for future research to address modes of delivery of AF and anticoagulation education for clinicians, individuals and their caregivers

Oterhals et al., (2014) carried out quantitative research study using a validated questionnaire to investigate European cardiovascular nurses' knowledge on the overall

management of anticoagulation and if knowledge was influenced by level of education and years in clinical practice. This study examined the nurses' knowledge on the use of anticoagulation and the education of patients around their medication use. It did not focus specifically on anticoagulation use in the setting of AF, but it did list it as one of the indications for anticoagulation use.

A forty-seven item questionnaire on the practice patterns and knowledge on warfarin (drug and food interactions) or new oral anticoagulants use, nurses' knowledge in relation to these was assessed and if the level of knowledge was influenced by the level of education or years in clinical practice. The questionnaire was distributed to nursing delegates attending a European Society of Cardiology Council on Cardiovascular Nursing and Allied Professional meeting.

Six-hundred and forty-six nursing delegates attended the meeting with a response received from two-hundred and six nurses giving a response rate of 32%. Of those nurses that responded 84% had direct patient contact, seventy-seven had basic nurse training fifty-seven had a Bachelor Degree, thirty had a Master's Degree and three had a PhD.

A limitation of the study was the low response rate which may be attributed to the fact that the survey was carried out during a busy conference, also the authors note that the questionnaire was on a highly specific area of clinical practice where information and knowledge on the topic might be low among delegates. The results showed that European cardiac nurses have some improvements to make in the knowledge of oral anticoagulation in order to ensure that a high-quality of care is delivered to their patients. Also findings showed that there were no significant differences in total knowledge on oral anticoagulation found between nurses who were practising nursing less or more than 10

years. However, it did show that there was a consistent decrease in the level of knowledge with increasing levels of education. It is the responsibility of the nurses to keep themselves up to date with recent developments in oral anticoagulation and be properly educated about their use, the risks and benefits and side effects as a lack of knowledge may lead to inappropriate patient education and counselling and adverse medical outcomes.

A similar study was carried out by Newall et al., (2005) this study aimed to determine how much paediatric cardiology nurses understood about warfarin therapy, given their role as patient educators. A questionnaire was distributed to paediatric cardiology nurses working in four Australian hospitals that provided pediatric cardiology services, a highly specialised area of clinical practice. The questionnaire was specifically designed for this study with the authors stating that the face validity was assessed independently, the authors fail to say that a pilot or test was carried out, face validity is often said to be weak and very casual, and many researchers do not consider it an active measure of validity (Engel & Schutt, 2013, cited in Akeem, 2015).

A response rate of 43.6% was achieved with forty-one out of ninety-four nurses responding, the majority of nurses held an undergraduate degree and were classified as senior nurses in a highly specialised area. One centre did not return any of the questionnaires. Although 30% of nurses felt they had the knowledge to provide patients and families with education regarding medication regimes, however the effectiveness of this education was rarely evaluated, the findings suggest that paediatric nurses caring for children frequently prescribed warfarin therapy are not sufficiently prepared to provide patient/parental education regarding warfarin. The lack of understanding was not limited to any one aspect of warfarin therapy, respondents demonstrated knowledge deficits in the areas of pharmacodynamics, principles of management, and adverse events.

A review of these studies highlight a lack of in-depth knowledge among nurses working in specialised areas where anticoagulation is frequently prescribed for patients with AF and other cardiac conditions. The provision of education to patient and their caregivers/families requiring anticoagulation is likely to increase compliance, nurses' involvement in providing this education on the medical condition and treatment options available is both necessary and vital to achieve better outcomes and quality of care for patients.

The literature review, also revealed common themes relevant to this study: the educational needs of patients diagnosed with AF in relation to the perception and knowledge of AF, knowledge of anticoagulants in AF, the under use of anticoagulation by clinician's and the lack of knowledge around the use of stroke risk stratification tools in the setting of AF, which will be explored below.

Educational needs of patients with AF

Literature related to the educational needs of patients with AF, six studies were reviewed, and the findings showed that patients with AF and their caregivers have a limited level of knowledge about their condition AF, and also a limited knowledge about stroke risk associated with and AF (Frankel et al., 2015; Koponen, et al., 2007; Lane et al., 2006). In two studies, Koponen et al., (2007) and Lane et al., (2006) found that about one-half of people with AF did not consider it a serious condition or that it put them at a risk of stroke, they were unaware of asymptomatic AF, the detection and treatment of AF.

Koponen et al., (2007) carried out a quantitative research study to determine knowledge improvement of AF three months after discharge from emergency room visit, it was part of a larger prospective and observational study on the quality of acute care of AF in three Emergency Room's (ER'S) in Helsinki, Finland. An AF knowledge test/questionnaire was

given to patients at discharge and again three months later, participants could complete the questionnaire before leaving the hospital or complete it at home. The questionnaire to assess the knowledge level of patients of AF was developed specifically for this study, a pilot test was carried out amongst medical and nursing experts, clinical nurses and thirty patients, minor adjustments were made prior to starting the study.

Two-hundred patients gave informed consent and all completed both sets of questionnaires. The study ran over a seven-month period and during this time 1089 patients presented to the ER's, giving a total of 18% (N=200) representation of this population in the data results.

The findings of the study highlight significant gaps in patient's knowledge of AF, those with a previous diagnosis of AF had a moderate level of knowledge AF when assessed in the emergency room but only showed limited improvement shown on three month follow up, for one-third of the respondents this was their first presentation with AF.

At the three month follow up the greatest improvement in knowledge was found in relation to the use of anticoagulation and in the area of AF symptoms and its effects on everyday life, however, half of the patients still had an unsatisfactory level of knowledge about detecting AF, and seeking treatment with those who were first time presentations, older people and women faring the worst among the respondents.

This study highlights the missed opportunities for medical staff to provide education and improve patients' knowledge on AF and anticoagulation use during their hospital consultation, and highlights the need for follow up education and support after a hospital visit.

Lane et al., (2006) undertook a mixed methods pilot study using both interview and questionnaires to assess patients' knowledge and perceptions of AF and anticoagulation. Ninety-three patients participated in the study where initially an interview and education session was delivered to patients by researchers, a questionnaire was completed and a booklet explaining all about the condition was given to patients to take home. Patients knowledge was reassessed by interview and repeat questionnaire eight weeks later.

Only thirty-three (36.5%) participants out of the original ninety-three completed the second set of interviews and questionnaire. At baseline only 49% of patients could name their condition, although the majority were aware that AF was an arrhythmia 80% baseline versus 91% at follow-up, about half the patients perceived AF as a serious condition or were aware that AF predisposes to thromboembolism at baseline. Following the educational intervention there was a non-significant increase in patient knowledge of the risks associated with AF. Of those who completed both questionnaires, 52% were aware that anticoagulants prevented blood clots, which increased to 70% post-intervention. However, few patients were aware of the benefit of stroke prevention associated with anticoagulants at baseline (21%) or after the educational intervention (27%). Overall knowledge of AF and anticoagulation was poor and did not significantly improve with education after eight weeks.

Potential limitations of the study were the loss of sixty patients to follow up, the level of information in the written booklet may have been above the comprehension level of some of the participants, this was not assessed in the study, and that the study took place in a busy out-patients department where time constraints were a factor.

This study highlights the lack of knowledge of AF and anticoagulant therapy that's exists among AF patients, however it demonstrates the potential benefits of education patient information and appropriate written materials in improving AF patients' knowledge about their condition.

Frankel et al., (2015) in their quantitative study used a survey to characterise the impact of stroke on AF patients and their caregivers and identify gaps in the knowledge and perspective of both physicians and patients in relation to anticoagulation use. The surveys were conducted online or by telephone over a three-month period, with both patients and physicians taking part. Four hundred and ninety-nine patients and five hundred and seven physician took part in the study.

Again their findings were consistent with previous research with just more than half of AF patients could identify having a stroke as a consequence of AF, with 37% of the respondents indicating that they were not informed by their doctors of the increased risk of stroke in AF. They found that most of the patients surveyed were interested in learning all the could about AF and reducing the risk of stroke, but only half reported that they had received written educational material on AF related stroke. The majority of caregivers who responded wished that they had learned more about the increased risk of stroke in AF before the stroke happened.

These studies highlight the dearth of knowledge of AF and its consequences among the AF population following contact with medical personnel and highlight a gap in service provision that needs to be addressed in order to improve patients understanding of their serious medical condition.

Knowledge and adherence of Anticoagulation

Anticoagulation medication is an effective treatment option for people with AF to reduce the risk of stroke and death, however there is suboptimal adherence and knowledge of the benefits and risks of oral anticoagulation (Rolls et al., 2017; Obamiro et al., 2017).

Koponen et al., (2007); Lane et al., (2006) in their research studies outlined in the previous section found that individuals on anticoagulation recognised the purpose for anticoagulation but have deficient knowledge about the risks associated with taking anticoagulants. They were aware of the purpose of taking anticoagulation that it was for preventing thrombus formation but the correlation for prevention of strokes was lacking (Lane et al., 2006).

Frankel et al., (2015) found that although there was a high use of medication and compliance in their population oral anticoagulants were only used in 72% and 88% stated that they only took their medication with regularity.

Rolls et al., (2017) utilised a cross-sectional quantitative survey examining the relationship between knowledge, health literacy and adherence in patients taking oral anticoagulants for AF. Forty-eight patients took part in the study, a sample size of above forty was predetermined before the start of the study. Participants in the study were given a financial reward as a recruitment incentive which may bias recruitment. The study found that almost half of the respondents reported adequate adherence to their prescribed medication, however participants who self-reported adherence to their anticoagulant medication had significantly higher knowledge scores in health literacy testing than those who did not.

Correlations between health literacy, knowledge, and adherence scores were observed, suggesting that these are interlinked and should be considered when managing patients taking oral anticoagulation for stroke prevention in AF.

Similar findings were found in a study by Davis et al., (2005) when their study a cross-sectional survey of 52 patients was conducted. A survey was used to assess self-reported adherence, patient knowledge about warfarin therapy and the impact of warfarin therapy on quality of life were determined by self-administered questionnaires. The study found that 50% of the participants reported adherence to their medication regime, however only 14% had good anticoagulation control, where their INR was in therapeutic range.

Similar results were found in others studies where adherence to oral anticoagulation use was reported as low, Obamiro et al., (2018) in their quantitative study a questionnaire was used to measure the level of anticoagulation knowledge in patients with AF taking oral anticoagulants and investigate the association between patient-related factors and anticoagulation knowledge, and compare these results in patients taking two different types of anticoagulation - warfarin and direct-acting oral anticoagulant adherence to oral anticoagulation therapy in AF found that self-reported suboptimal

Participants were recruited using a Facebook campaign, an estimated that a sample size of at least 384 was required to ensure that the results were generalisable to the Australian population, where the estimated prevalence of AF is 1%-2%. The recruitment period was open until a minimum of 384 eligible responses were obtained a chance to enter into a draw for an Apple iPad mini was used as an incentive to encourage participation. Participants who did not have a diagnosis of AF or were not taking an OAC were considered ineligible.

The results of the study showed that adherence to oral anticoagulation was sub-optimal, with only 54.9% reported a high level of adherence, predictors for non-adherence included, male gender, younger patients, lower satisfaction with therapy, higher burden of health information, and more concerns about making mistakes and cost. These findings suggest that identifying and resolving modifiable patient related, factors has the potential to improve adherence and thus prevent a stroke.

Mazoor et al., (2017) utilised a retrospective observational cohort study using databases, the objective of the study was to evaluate patterns of medication adherence and persistence in a real-world setting among anticoagulant -naive and anticoagulant-experienced patients with AF who were treated with direct oral anticoagulants. A total of 66,090 patients met study criteria, and their results showed that overall adherence and persistence are suboptimal and both decrease over time, and those patients with previous experience of anticoagulant use fare better in terms of adherence and persistence with DOAC therapy than those who are newly initiated on DOAC therapy.

Literature in relation to knowledge of anticoagulation therapy and adherence to medication regimes is poor amongst patients with AF, this can be attributed to poor health literacy, lack of understanding of the serious consequences of non-compliance with oral anticoagulation and poor education and information delivery and long term follow up by medical personnel.

Opportunistic Screening

AF is an emergent health concern, however a person's stroke risk can be reduced through timely detection and diagnosis of AF and application of evidence based treatments as under treatment exposes people to a significant risk of fatal or disabling stroke (Ferguson et al., 2016; Freedman et al., 2017).

The European Society of Cardiology Guidelines for the management of atrial fibrillation has recommended opportunistic screening to detect AF in all people aged 65 years and over by taking their pulse and carrying out an ECG (Camm et al., 2012).

Freedman et al., (2017) in their report of the AF-Screen international collaboration state that irregularity of the pulse is a simple way to screen for AF, but that pulse palpation is seldom carried out in routine practice. They recognise that a screening programme is highly dependent on the health system for each country as screening needs to be linked to a pathway for diagnosis and management.

As examined earlier in this chapter, in their quantitative study, Smyth et al., (2015) Atrial Fibrillation screening in Ireland, worryingly findings indicate that prior to the commencement of the study 6.2 % of respondents (doctors and nurses) reported that they did not regularly check the pulse of a patient over 65 years of age.

Mairesse et al., (2017) in the European Heart Rhythm Association consensus document, screening for atrial fibrillation state that early detection of AF, even if its asymptomatic, incidentally found at routine physical examination, during a blood pressure measurement, a pre op ECG or as a result prevention of a fatal or disabling stroke is achievable by commencing anticoagulation. During their systematic review of the literature they found that the prevalence of AF across all studies was 2.3% increasing to 4.4% for those aged over 65 years and the overall incidence of previously unknown AF was 1.4%.

They reviewed the various methods of providing opportunistic screening stating that the simplest method of screening in AF is taking a pulse, if an irregularity is detected a follow up ECG should be carried out. If an automated BP machine is being used it should be used on the basis that it has the ability to detect an irregular heart beat – oscillometric analysis.

They recommend that opportunistic screening should be done whenever a patient is being assessed, routine GP visit, hospitalisations etc. and systematic targeted screening be used for those at high risk populations.

Conclusion

Most patients with AF possess very limited knowledge about their cardiac condition, its consequences, and how anticoagulant treatment can benefit them. Patients 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 recognise the symptoms that indicate AF or the symptoms that should prompt a call to seek help.

Nurses are often the first line of defence, patients come to nurses first, therefore nurses are well positioned to carry out opportunistic screening – take a pulse while asking the patient how they are feeling. However, this alone will not be sufficient as nurses need to become more knowledgeable about all aspects of atrial fibrillation and anticoagulation use in stroke prevention if they are in turn going to educate patients.

Data on the knowledge of AF, stroke risk, anticoagulation and opportunistic screening is scant in Ireland, this small study seeks to redress the situation by assessing the knowledge of nurses working in a AMAU in a level four hospital in relation to AF, its treatment and consequences. A qualitative descriptive design is utilised in the study as detailed in the next section.

Chapter 3 – Methodology

Introduction

This chapter will outline the methodology employed in this study. In order to illustrate how the chosen methodology was deemed appropriate to explore the study question, a discussion of research approaches will be presented. In addition, details regarding sample selection, data collection, data analysis, rigour and ethical considerations are discussed.

In order to answer the research question, to explore nurses' knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulant use, the researcher choose a qualitative descriptive approach. Qualitative description is amenable to getting straightforward answers to questions of special relevance to practitioners (Sandlelowski, 2000).

Research Approaches/ Methods in Nursing

The main reason research is carried out is to provide an evidence base to inform best practice (Polit et al., 2001). The research design selected for research should be the one most suited to achieve an answer to the proposed research question, it is the plan of how the research is structured and organised. Research methods are the techniques used by

researchers to structure a study, gather and analyse information relevant to the research question (Polit et al., 2001). The most common methodology distinction focuses on differences between quantitative and qualitative research. Quantitative research is more closely associated with the positivist paradigm, to predict events and examine cause-effect relationships, while qualitative research is most often associated with naturalistic, relativistic inquiry to gain a deeper understanding of events or the phenomenon being explored (Krauss, 2005; Van Manen, 1997).

Quantitative Research

Quantitative research is a traditional scientific method of carrying out research, it involves formal scientific, objective examination and systematic approach of numerical data to obtain information using statistical methods (Burns & Grove, 2009; Wright & Schmelzar, 1997). Researcher's adopting this method, approach potential research to find out the 'truth' that they view as absolute, the ontological position of the quantitative paradigm is that there is only one reality and this can be defined by careful measurement (Carter, 2000).

As stated previously quantitative research is associated with the positivist paradigm, a core belief of positivism is determinism – effects have a determinable cause and that actions have predictable outcomes (Gidding & Grant, 2007) positivism offers an assurance of unambiguous and accurate knowledge of the world (Burns & Grove, 2011). Empirical evidence is gathered by using formal instruments to collect the data, which is later analysed to identify emerging patterns and trends (Polit & Beck, 2011).

The use of quantitative research approach in nursing can be useful for selected questions relevant to nursing, generating evidence essential for theory guided and evidence-based nursing practice, addressing questions of effectiveness, that is, whether or not an

intervention actually works. The recognition in nursing of the need for evidence-based practice, the valuable role of systematic reviews and the setting up of initiatives such as NICE all demonstrate the importance of quantitative research in healthcare (Seers & Critelton, 2001; Ailinger, 2003).

However, the inability of quantitative research to identify phenomena such as thoughts and feelings has led to the researcher to use a qualitative approach to their study.

Qualitative Research

Qualitative research involves a systematic, interactive and subjective approach (Burns & Grove, 2011) and is utilised to describe human experiences and meaning to those living the experience. Qualitative research is associated with the naturalistic interpretivism paradigm as an alternative to positivism (Parahoo, 1997; Nicholls, 2009), it strives to understand what it is meant to be human and to understand the experiences through the people experiencing them, it allows researchers to explore feelings, behaviours, experiences and perspectives of a situation through a holistic framework (Holloway & Wheeler, 2002).

Qualitative research arose due to the fact that previously favoured quantitative methods were unable to portray the essence of human behaviour, it is a tool that can help nurses to answer questions about the human experience of health, sickness, well-being, healing and dying, and it can also assist in the development of supportive, effective care delivery systems (Magilvy & Thomas, 2009). Qualitative research focuses on understanding the whole that is in keeping with the holistic philosophy of nursing (Munhall, 2001).

Qualitative research in nursing has descended from numerous other disciplines, it has its methodological roots in history, anthropology, philosophy and sociology (Hall, 2006). In

nursing research, it is traditionally divided into three common methodologies ethnography (social issues – individuals studied in context), phenomenology (looks at individuals' perceptions and lived experience) and grounded theory (develops theory) (Brown, 2009; Hall, 2006). Each one of the methodologies are guided by an explicit set of philosophical assumptions which in turn guides the research (Polit & Beck, 2008). Within the paradigm of qualitative research other approaches such as qualitative descriptive, action research and case study research have emerged.

Design approach

A qualitative descriptive approach was employed in this research study, it differs from the afore mentioned methodologies, as it is neither thick description (ethnography), interpretative meaning of an experience (phenomenology), nor theory development (grounded theory) but a straight description of an experience or an event (Neergard et al., 2009). Qualitative description is grounded in the general principles of naturalistic inquiry (Jiggins Colorafi and Evans, 2016; Sandelowski, 2000). Naturalistic inquiry deals with the concept of truth, whereby truth is a systematic set of beliefs, together with their accompanying methods, where something is studied in its natural state (Lincoln and Gubba, 1985; Sandelowski, 2000).

Qualitative description is an approach used in qualitative research studies that are descriptive in nature, and has been identified as 'important and appropriate for research questions focused on discovering the who, what, and where of events or experiences and on gaining insights from informants' (Kim et al., 2017).

Sandelowski (2000) promotes the use of qualitative description as a well-developed but unacknowledged method of qualitative research, 'it is especially amenable to obtaining

straight and unadorned answers to questions of special relevance to practitioners and policy makers'. It has been argued that proper use of the method can provide useful data, tailoring clinical interventions, scales and needs assessments (Neergard et al., 2009).

A qualitative descriptive study can stimulate inter-professional dialogue and research among staff nurses, clinical nurse specialists and graduate nurses, the results can provide depth to knowledge of the clinical situation and provide useful information to develop new interventions of enhance practice (Magilvy & Thomas, 2009). It is an approach that is well suited to junior health science researchers as it can be used with a variety of theoretical approaches, sampling techniques and data collection strategies (Jiggins Colorafi & Evans, 2016).

The use of qualitative description has been criticised for being neither clear or theory-based, having no clearly defined approach and viewed as a poor cousin to more developed qualitative methods (Milne & Oberle, 2005), Neegard et al., (2009) argue if 'pure description' is possible, even though description is the aim, interpretation is always present, so descriptions depend on the perceptions, inclinations and sensitivities of the researcher.

The design features of qualitative descriptive research were proposed by Sandelowski (2000) in her work 'What ever happened to qualitative description' outlining the theoretical framework, sampling, data collection, data analysis and reporting strategies to be adopted when using qualitative description approach.

In terms of the analytical process and presentation of data, researchers using qualitative descriptive approach stay closer to the data, findings are presented in straightforward language that clearly describes the phenomena being studied, drawing from a naturalistic

enquiry framework (Jiggins Colorafi & Evans, 2016), and will be discussed in detail in this chapter.

Where other qualitative approaches aim to develop concepts and analyse data in a reflective or interpretive interplay with existing knowledge and theories, the final product of a qualitative descriptive study is a description of informants' experiences in a language similar to the informants' own language (Neergard et al., 2009).

Researchers adopt a person-centred holistic and humanistic perspective to understand human lived experiences (Field & Morse, 1996). In order to achieve the emic perspective, the researcher became involved and immersed in the study and focused on the experiences, knowledge and opinions from the participants' perspective, and added to the uniqueness of data collection and analysis. Complete objectivity is impossible and research bias is frequently an issue in qualitative research, it is very important that the researcher was aware of their own perceptions and opinions as they may taint the research findings. Reflexivity and bracketing techniques were employed by the researcher throughout the study, this allowed the researcher to become more self-aware of preconceived opinions, beliefs and biases. These beliefs and preconceptions were set aside, and allowed the researcher to focus on the participants' knowledge and opinions and shape the data collection and analysis processes according to them.

Sampling Strategy

One of the most crucial tasks in designing a research study is deciding the number and characteristics of the participants invited to take part in the study (Parhoo, 1997). Sampling is defined as the process of selecting representative units of the population for study in a research study (Lo Bindo-Wood and Harper, 2002).

Magilvy & Thomas (2009) suggest that for a qualitative descriptive study the sample is often smaller than in other qualitative designs and is conveniently and purposively selected, with a typical sample size maybe as few as three to five people, ranging up to about 20 participants. A small sample size allows for the novice researcher to develop interviewing skills, become a good listener and generate a manageable amount of data (Magilvy & Thomas, 2009).

Qualitative research studies use small purposive or selective samples, because of the in-depth nature of the study and analysis of the data required (Cormack, 2000), purposive sampling participants are selected on their unique experience of a particular phenomenon under study (Polit & Beck, 2008).

The focus in qualitative research is on the depth and quality of the data, to discover meaning and to uncover a multiple of realities. In any qualitative study the ultimate goal of purposeful sampling is to identify and select cases deemed information-rich for the purpose of the study and for the most effective use of limited resources (Sandelowski, 2000; Patton, 2002).

Purposeful sampling involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with the subject of interest (Cresswell & Plano Clark, 2011). In addition to knowledge and experience, the importance of availability and willingness to participate, and the ability to communicate experiences and opinions (Bernard, 2002).

For this study purposeful sampling was used and participants were selected on the basis that they were nurses working in the acute medical assessment unit, in a level four teaching hospital. All nurses working in the unit were invited to take part in the study, a total of six

nurses responded, however one nurse was unable to participate on the arranged date as the unit was extremely busy that day and was unavailable after that to take part in the study. A total of five nurses were interviewed.

It has been noted that small sample sizes employed in qualitative research have received some criticism (Parahoo, 1997; Polit et al., 2001) due to the lack of generalisability of findings in qualitative research and has led to questioning of its usefulness in health care research (Patton, 1990; Giacomini, 2001). However, in qualitative research the type of sampling employed is determined by the methodology selected and the topic under investigation, not by the need to create generalisable findings.

Gaining Access and Informed Consent

A letter of permission was sought from the Director of Nursing to carry out the study (Appendix I) permission was granted. In consultation with the AMAU nurse manager an information session was carried out all nursing staff were invited to attend. Information detailing the objectives of the study, the design of the study - using interviews as the data collection tool and information leaflets/consent forms (Appendix II) were distributed to staff and more were left for nurses who could not attend the information session. An opportunity for nurses to ask questions and clarify any queries raised was given by the researcher to the attendees.

Informed consent means that participants have adequate information regarding the research and that they comprehend the information and have the power and free choice, enabling them to consent voluntarily to participate in the research or decline the invitation (Polit et al., 2001). Informed consent was achieved through the issuing of the information leaflet/consent form before the study, participants could contact the researcher should they

wish to know more about the study and/or wish to arrange to attend for interview. A sealed box was also made available for participants to return their forms. Two weeks was allowed between the information session and undertaking the interviews.

Data Collection

The purpose of the research interview is to explore experiences, beliefs, views and motivations of individuals on a particular topic or subject, the use of interviews is one of the common methods of data collection in qualitative research, it allows for a deeper understanding of the persons' views on and experiences in specific matters (Silverman, 2000; Gill et al., 2008).

There are three common types of interviews are employed in research to collect data; structured, semi-structured and unstructured. Structured interviews are essentially verbally administered questionnaires when information is required on a specific topic, with no variation, no scope for follow up questions to responses, they are of little use if in-depth responses are required. However, they are quick and simple to use and helpful if participants have literacy problems (Gill et al., 2008). Conversely, unstructured interviews do not have any pre-determined questions, pre-conceived theories or ideas (May, 1991), they are used when significant 'depth' is required or where there is virtually nothing known on a topic or a different view or perspective is required on a subject or topic (Gill et al., 2008).

Semi-structured interviews consist of key questions that help to explore and define the topic being examined they allow the interviewer and the interviewee to diverge to pursue an idea or reply in more detail (Britten, 1999) they provide flexibility when compared to structured

interviews and allow for the discovery of information that is important to the participants, this interview format is the most frequently used in healthcare research (Gill et al., 2008).

For the purpose of this study data was collected through the use of audio-recorded semi-structured interviews. Open ended questions were used as an interview guide (Appendix III). Qualitative methods such as interview provide deeper understanding of a phenomena than would be obtained from a questionnaire, and are most appropriate where detailed insights are needed from individuals, or where little is known about the topic (Gill et al., 2008).

The interview guide used in qualitative description is a little more structured than in other qualitative methods, it is typically based on expert knowledge to focus on areas in healthcare that are either poorly understood or amenable to change (Neegard et al., 2009).

Interviews were arranged at a time and place that suited the participants. Three of the participants chose a quiet office in their place of work, early in the morning before their work day began, that was quiet and free from distraction, a do not disturb sign was placed on the door, refreshments were provided. Carrying out interviews in a familiar environment allows the participant to relax and it may result in a more detailed and productive interview (Gill et al., 2008). Two interviews were carried out in the researchers' office again at a time convenient to the participants, the office was quiet and free from interruption and distraction.

The first interview was used as a pilot, to examine the researcher use of the interview guide, to try to reduce the number of closed questions asked, and allow for more probing of certain responses and themes generated by the participant.

Before the interviews took place the participants were informed about the study and were given assurance about ethical principles such as confidentiality and anonymity, it also allowed the participants to have an idea of what to expect from the interview and help to put them at ease after some informal conversation the interview commenced once the participant felt comfortable and relaxed.

One to one interviews were carried out with the average length of interview lasting 15 minutes, throughout the interview the interviewer noted non – verbal actions, behaviours and facial expressions, which was documented in field notes once the interview was completed. Semi-structured interviews consist of several key questions that help to define the topic that is being explored, it also allows the interviewee to digress and explore a response in more detail (Britten, 1999).

All the interviews were transcribed verbatim by the researcher. ‘Field notes’ that were made during the interviews about observations, thoughts and ideas about the interview were added to each of the transcripts once typed.

Data Analysis

Data collection and data analysis took place concurrently, which allows for revision and identifying emergent themes. Thematic analysis (Braun & Clarke, 2006) was the approach used to analyse the interview transcripts, to identify themes within the data and group together into patterns and subthemes. Thematic analysis as described by Braun and Clarke 2006, was the framework applied to the data generated in the interview using the six steps to guide the analysis, allowing data from each of the interviews to be coded and themes identified which reflected patterns within the data.

The first step in the process of data analysis was to familiarise myself with the data, this was done by transcribing the data, the interactions noted in the field notes and then reading and re-reading the transcripts. During this stage initial thoughts about emerging codes and themes were written down.

The second stage involved generating preliminary codes from the data which appeared meaningful and interesting, the researcher was conscious of their own knowledge and perspectives and was conscious to bracket these during the analysis and allow the codes to emerge without bias.

The third stage of the six stage process is searching for themes within the codes generated, at first it was difficult to split the themes into overarching main themes but re-reading and analysing the data and codes allowed for a more focused analysis and emergence of the themes and subthemes and the relationship between them.

The fourth stage in the process concentrates on reviewing each theme and how to combine, refine, separate, or discard initial themes. A thematic map was generated which allowed the researcher to identify clearly the themes that emerged.

The fifth stage involved naming of the themes and the subthemes from the data, a clear and distinct logic for the grouping of the subthemes into the main theme was evident.

The sixth stage of the process is producing the report that transforms the initial data analysis, coding, generating of themes that relates to the research question and the literature reviewed on the area of AF, and this report will be presented in the findings chapter.

Rigor/ Trustworthiness in Qualitative Research

Rigor and truth are always a concern for qualitative research, and appropriate measures must be conducted from the preliminary steps of conceptualisation of the research topic and question, planning the research design, gaining access to the research site and participants', data collection and analysis right through to reporting the research findings and conclusions, the qualitative researcher must be concerned with rigor. To ensure rigor appropriate steps must be conducted during the research process rather than only adhering to set criteria for rigor after the completion of the study (Cypress, 2017). Morse et al., 2002 state the rigor must be built into the qualitative research process per se not to be proclaimed at the end of the inquiry, focusing on strategies to establish rigor at the end of the study rather than during the inquiry, exposes the investigators to the risk of missing and addressing serious threats to establishing rigor.

Rigor is defined as the quality or state of being very exact, careful, of the quality of being thorough and accurate ((Oxford Dictionary).

In qualitative research rigor has been referred to as the trustworthiness and authenticity of the study, and are similar to the terms of reliability and validity in quantitative research (Jiggins Colorafi & Evans, 2016). Lincoln and Guba's work in the 1980's reliability and validity were replaced with the concept of trustworthiness of qualitative research (Cypress, 2017).

Trustworthiness is a goal of the study, something to be judged during the study and after the research is complete, Lincoln and Guba refer to trustworthiness as something that evolved from 4 major questions about truth value, applicability, consistency and neutrality. From these they propose 4 terms of credibility, transferability, dependability and confirmability that the researcher should engage in to able to satisfy the criteria and attain trustworthiness (Cypress, 2017). Streubert and Carpenter (1999) add that trustworthiness of

the research depends on the extent to which it delves into the participants' experience apart from their theoretical knowledge.

The four criteria outlined by Lincoln and Guba (1985) was used in this study to ensure that the study findings reflected a valid and true description of the participants' views and free from bias.

Credibility

Polit et al., (2001), state that credibility refers to the confidence of the data. Credibility is similar to internal validity in quantitative research. Credibility exists when the research findings reflect the perceptions of the people under study, the truth or believability of the findings (Sandelowski, 2000).

Credibility in qualitative work promotes descriptive and evaluative understating (Jiggins Colorafi & Evans, 2016) was achieved by addressing the following the steps

- *Prolonged involvement*: This refers to “investment of sufficient time to learn culture test for misinformation, build trust and generally repeating the procedure central to the case study” (Robson, 1997). The researcher has worked in this environment in their current role for the past six years and has knowledge of the day to day nursing activities within the unit.
- *Triangulation*: This refers to the use of multiple referents to draw conclusions. It involves evidence from different sources; different methods of collecting data and different investigators (Robson, 1997). The use of triangulation enables the researcher to

strive to distinguish true information. The researcher conducted a literature review to familiarise themselves with the content of the phenomenon under investigation, collected data by means of one to one semi-structured interviews to get in-depth data regarding the nurses' perceptions and knowledge of the research topic. The interviews were transcribed verbatim to ensure accuracy and enhance credibility. The data and interpretations in each category were cross checked with the researcher's supervisor.

- *Peer debriefing*: This refers to exposing the researcher's analysis and conclusion to a colleague or other peers on a continuous basis for the development of both design and analysis of the study, to review the audit trail, coding scheme and emergent findings and compare outcomes (Robson 1997; Koch, 2006). The researcher liaised with college supervisors regarding interview transcripts, data analysis of initial codes and emergent themes, thus ensuring the themes reflected the participants' views.

- *Reflexivity*: In qualitative research the researcher is both the researcher and the participant and can therefore not be divorced from the phenomenon under study. According to Parahoo (2006), reflexivity is a continuous process whereby researchers reflect on their preconceived values and those of the participants, such as reflecting on how data collected will be influenced by how the participants perceive the researcher. Cypress (2017) states that through reflexivity researchers become more self-aware and monitor and control their biases and should reflect on their own actions, feelings and conflicts experienced during research. To achieve credibility of the study, the researcher adopted a self-critical stance to the study, the participants, their role, relationships and assumptions.

- *Bracketing*: Qualitative researchers use bracketing to improve rigour and to reduce bias. Parahoo (2006) defines bracketing as "suspension of the researcher's preconceptions, prejudices, and beliefs so that they do not interfere with or influence the participants'

experience". Streubert and Carpenter (1999) affirm that bracketing means not making judgment about what was observed or heard and remaining open to data as it is revealed. Burns and Grove (2003) add that bracketing means that the researcher lays aside what they know about the experience or topic being studied. Bracketing was therefore done throughout and made it possible for the researcher to focus on the participants' views and shape the data collection process according to it.

In order to reduce bias in this study the researcher adopted all of the principles detailed above, ensuring that the participants were aware that the information provided was for the purpose of the study, as the researcher worked in the hospital where the interview took place trust was already established.

Transferability

Transferability refers to the probability that the study findings have meaning to others in similar situation. Transferability has also been labelled "fittingness". The expectation for determining whether the findings fit or are transferable rests with potential users of the findings and not with the writers (Guba and Lincoln, 1985; Sandelowski, 1986). According to Holloway and Wheeler (2002), transferability means that findings of the research project can be applicable to similar situations or participants. However, sample to population generalisability is important to quantitative researchers and less helpful to qualitative researchers who seek more of a case to case transfer (Jiggins Colorafi and Evans, (2016). Lincoln and Guba (1985) state that as the naturalist cannot specify the external validity of an enquiry, they can only provide a tick description necessary to enable someone interested in making transfer to reach a conclusion about whether a transfer can be contemplated as a possibility.

Jiggins Colorafi and Evans (2016) state that transferability in qualitative research can be aided by;

- *describing characteristics of participants*
- *describing sample and setting*
- *providing thick descriptions of findings and that they are congruent with theory*
- *suggesting ways your findings could be tested by other researchers.*

In this research study transferability was enhanced by using purposeful sampling methods and providing thick description about setting, data collection and analysis.

Dependability and Confirmability

Dependability in qualitative research closely corresponds to the concept of 'reliability' in quantitative research (Cypress, 2017), in which there can be no validity without reliability the same holds true for dependability – there can be no dependability without creditability.

Lincoln and Guba (1985) suggest that in any research study if the findings are to be dependable they should be accurate and consistent.

Confirmability refers to the neutrality or objectivity of the data (Polit, 2001) the research findings are a result of the research and not the researcher's preconceptions or assumptions

Miles et al., (2014) outline some controls for ensuring dependability and confirmability;

- *deriving study procedures from clearly outlined research questions and conceptual theory linking data analysis back to theoretical constructs.*
- *describing the investigators role*
- *triangulation through use of interviews, observations*

- *demonstrating consistency in data collection for all participants'*
- *developing interview questions and observations based on theory, revised and tested*
- *developing a coding manual prior to guide data analysis*
- *developing a monitoring plan to ensure the junior researcher does not go ' beyond the data' (Sandelowski, 2000). Data analysis and collection should occur at the same time.*
- *developing an audit trail*

Sandelowski (2000) notes that research findings are auditable when another researcher can follow the decision trail. An audit provides raw data, data analysis techniques, process notes such as rationales and interview guides (Lincoln and Guba, 1985). The researcher used an audit trail from the beginning to the end of the study to show how constructs, themes and their interpretation could be followed. Comprehensive field notes during and after every interview were recorded, and reflectivity was used to reduce bias and record the researchers' thoughts. The author was the data-gathering instrument, allowing for data collection and analysis to occur simultaneously.

In conclusion rigor in qualitative research is demonstrated through the writer's attention to and confirmation of information discovery. The goal of rigor in qualitative research is to accurately represent study participants' experiences (Streubert and Carpenter, 1999). Rigor is a process that commences at the very conception of a study and considered and adhered to throughout the entire study process, as detailed above.

Ethical Issues

The inclusion of ethical consideration is vital in any piece of research undertaken, regardless of the methodological underpinning of the research design. When carrying out the researcher has to be cognisant of the following in relation to ethical considerations, these

include gaining ethical approval, respect for autonomy including the right to self-determination, the right of full disclosure, the right to withdraw at any time without consequence, participant confidentiality and pseudonymity, obtaining written informed consent and adherence to the ethical principles of beneficence, non-maleficence, autonomy, justice and veracity. The Nursing and Midwifery Board Ireland (2015) issued ethical principles to be used as a framework to guide nurses and midwives involved in all areas of research. These principles address issues of nursing research by informing nurses of their obligation to ascertain that the research is sanctioned by the appropriate body and to ensure the rights of the participants are protected at all times, and ensure the highest possible standards in every aspect of research and must be adhered to by nurses and midwives. Ethical approval was sought and granted from the researchers' Hospital Research Ethics Committee, the local ethics committee prior to the commencement of the study (Appendix IV). The function of the ethics committee is to maintain high standards of research and to ensure the preservation of subject's rights within studies, (Brennan, 1995). Ethical principles that have been identified by many in the literature and include respect for persons, autonomy, beneficence, veracity, fidelity, non-maleficence, justice, fairness, and confidentiality (Beauchamp and Childress, 2009; Polit and Beck, 2004; Storch et al., 2004).

Principles of Autonomy

The principle of autonomy is referred to as the principle of self-determination this means that prospective participants have the right to decide voluntarily whether to participate in a study, without the risk of incurring any penalty treatment, (Polit et al., 2001). Participant's were made aware that the interview could be abandoned at any time should they feel distressed. Also, on completion of the interview they still had the right to withdraw from the

study at any time with no recourse. Involvement in a study should not place participants at a disadvantage or expose them to situations for which they have not been explicitly prepared (Polit et al., 2001).

It is impossible to discuss autonomy for the individual without addressing the area of full disclosure. This is directly linked to the principle of full disclosure in which the writer provides full information, on areas related to the nature of the study also on the subjects right and free choice to participate in the study or not. Therefore, full disclosure is concerned with the provision of information prior to the commencement of the study. In this study all potential participants received an information leaflet outlining the aim, structure and voluntary nature of the study.

Informed consent means that participants have adequate information regarding the research and that they comprehend the information and have the power and free choice, enabling them to consent voluntarily to participate in the research or decline the invitation (Polit et al., 2001). Informed consent was achieved through sending the information sheet and consent

form before the study and requesting participants to contact the researcher should they wish to know more about the study and/or wish to arrange to attend for interview.

Two weeks was allowed between sending out the information leaflets and undertaking the interviews.

Principles of Beneficence and Non Maleficence

Beneficence is the requirement to benefit the participants/patient and is the underlying principle of healthcare research while non-maleficence assumes that no harm should come

to the research participants as a result of taking part in the study, (Beauchamp and Childress, 2009). The principles of beneficence and non-maleficence are therefore of significant importance as the writer aims to strike a balance between 'doing good' and 'first do no harm', (Beauchamp and Childress, 2009). As participants in this study were nurses not patients the issue of causing harm to patients was not an issue, however it's important to ensure that no harm was caused to participants as well. Confidentiality and anonymity was discussed at length with each participant prior to interview, with a guarantee that both issues would be upheld, and not knowingly breeched throughout the study. Participants were assured that any personal details or identifying information of a participant would be anonymised in the coding process and individual participant personal details did not become part of write up.

Justice, Veracity and Fidelity

The principle of justice is synonymous with fairness, the researcher ensured that all participants were treated fairly and equally throughout the research process.

Veracity involves the concepts of truth and absence of deception, and is linked with respect for autonomy (NMBI, 2015). The researcher was truthful with the participants at all times of the research study and explanations were given by the researcher to ensure the participants understand the implications throughout the study.

Fidelity, trust was built between the researchers and participants through the sharing of information, in an open and honest manner during the interview process a trusting relationship was developed and fostered.

Data storage

With regard to data entry and storage there are also ethical considerations. The researcher stored all data on a laptop (secure server and password protected). Data from recorded interviews was transcribed as quickly as possible and once themes had been identified these recordings were deleted. Information gathered from the interview process was gathered into themes and presented in a form that would make a direct link to individuals in the study impossible. The information that is gathered and presented as a result of the interviews would be a true reflection of the data collected and would be used for this research study only.

The material and data used for the study will be stored in a secure locked cabinet for five years and then destroyed.

Conclusion

As the researcher is a novice a qualitative approach to the study was chosen. For the purpose of the proposed research question, the researcher has chosen a qualitative descriptive design to explore nurses' knowledge of stroke risk in the setting of AF diagnosis and anticoagulant. The researcher did not aim to generate new theories or interpret the findings within a theoretical framework, but instead endeavours to present the findings as a complete descriptive summary of the findings. These are presented in the following chapter.

Chapter 4 - Findings

Introduction

In this chapter the researcher endeavours to portray the main findings from the interviews with nurses working in an AMAU setting. The aim of this study is to explore nurses' knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulant use in preventing stroke. Using the six thematic analysis steps described by Braun & Clarke (2006) four main themes emerged from the data; '*Understanding of AF*', '*Nursing Assessment*', '*Prevention*', '*Work Environment*'. Within each of the main themes subthemes emerged each of which will be described and explained in greater detail.

Theme	Subtheme
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Understanding Atrial Fibrillation	Definition of Atrial Fibrillation Symptoms of Atrial Fibrillation Stroke risk
Nursing Assessment	Manual pulse check Electro Cardio Graph (ECG's)
Prevention	Anticoagulation Assessment tools Barriers to anticoagulation/falls
Work environment	Team work Educational needs

Theme one – Understanding of AF

The term understanding was chosen to describe the varying definitions used by the participants when explaining their knowledge of what AF, the symptoms at presentation and stroke risk’.

Definition of AF

All participants had a basic knowledge of AF and felt they had enough knowledge to be able to explain the condition to patients.

‘I would say I would have basic knowledge, I would be able to talk to them (patients) in layman’s terms but I would appreciate more information’ P4: line 114-115.

The majority of the participants defined AF as ‘quivering’

'how I was taught, in my head it was like a quivering I suppose of the atria not sufficiently pumping the blood through into the ventricles, it doesn't have to be particularly fast rate but can be' P2: line 7-10.

'what it means to me is the quivering of the heart when the blood is not going nicely through the chambers and instead of it flapping through nicely and closing it quivers so it's in and out'. P3: line 9-11.

Another participant views the definition in another way

'Atrial fibrillation is where the valve in the atrium begins to flutter and isn't working sufficiently and doesn't allow for the blood to flow correctly down to the ventricle' P4: line 8-9.

With another participant just describing it as an arrhythmia,

'Atrial fibrillation is one of the arrhythmias which can cause an irregular fast heart rate' P5: line 7.

In relation to linking AF with stroke risk again participants had a varying knowledge of how AF causes stroke, with three participants specifically linking AF to the risk of clotting and potential risk of stroke

'going into their irregular heartbeats so I suppose skipping beat and that maybe clot formation' P1: line 57-58.

'atrial fibrillation is causing backflow of blood there is a chance of clotting which can be a further push down the circulatory system and into the brain eventually' P4; line 44-46.

However, one participant could only identify a link between AF and stroke

'All I know is that it does cause ischemic strokes' P3: line 50.

Overall the participants did seem to have a basic knowledge of AF and were able to identify the stroke risk attached to the condition although they did seem to link it with a fast heart rate.

Symptoms of AF

Participants were aware of the symptoms of AF, all mentioned the symptoms that are common to AF. A patient experiencing these symptoms maybe the reason for their presentation to the AMAU or AF may have been detected as an incidental finding at GP, in relation to patients with asymptomatic AF there was less discussion and awareness of this population among the participants.

When this participant was explaining about the symptoms and detection of they recognised the fact that clot formation can happen in both symptomatic and asymptomatic patients as they were talking:

'well sometimes people don't even know they have it, from our experience they have gone to the GP for another reason they might do an ECG and they might only pick it up in the ECG whereas other people might have symptoms feel an irregular heartbeat palpations'. 'If someone is very symptomatic if their heart rate is really, really high so

the risk factor then would be that they would throw off a clot and then have a stroke, I suppose that could happen as well if you weren't symptomatic' P5: line 9-13.

Another participant, P1, identified

'shortness of breath, pallor maybe dizziness collapse syncope that kind of thing' P1: line 17-18.

Two participants were hesitant when asked about asymptomatic patients, one of them had come across a few patients who were asymptomatic they seemed to be linking it with having a fast pulse rate;

'if you are in fast a fib you are going to have a fast pulse, it's going to be irregular you could have chest tightness, chest pain with it, shortness of breath you see a lot. Some people just have a funny sensation in their chest' P2: line 12-14.

'Asymptomatic patients, I don't see to many of them, I have met a few, recently on Friday I met a man in his 40's incidental finding of a fib he was at a medical he was at for a new job, he was running at 140 but never felt a thing. So yeah we do meet patients like that but it's not very often' P2: line 17-20.

However, one participant did not have much knowledge in relation to the asymptomatic population:

'asymptomatic population – I wouldn't really know exactly how much the population would be' P3: line 19.

Stroke risk

In relation to linking stroke risk with AF, three participants could link a diagnosis of AF with an increased stroke risk, one understood the role of anticoagulation in reducing the risk of stroke occurrence.

'I was doing my masters in preventative cardiology so we would have touched on the afib part of it but not too much into it because it was more to do with stroke, so that's when I would have been a little exposed to that with the older population' P3: line 42.

'it is higher especially when you are not anticoagulated' P3: line 47.

'I just know there is a greater risk of stroke with a fib, I think it's usually an infarct as opposed to haemorrhagic but would be kinda the main knowledge I would have really' P2: line 45-47.

In contrast one participant acknowledged that it was the presence of certain medical consultants to review particular patients highlighted to them the association of stroke and AF.

'from different consultants coming down and that there would be a risk of stroke' P1:line 42.

The first thematic area of understanding AF highlights different levels of knowledge amongst the nurses working in the AMU with regard to defining the condition, although they did recognise it as a heart quivering or arrhythmia, they all knew of the association of stroke risk with a diagnosis of AF but again varying levels of knowledge was apparent. The nurses were able to recognise the symptoms of AF but did not have much knowledge about asymptomatic patients, this will be explored further in the second theme.

Theme 2 - Nursing Assessment

The first assessment carried out on patients being admitted to the AMAU is usually done so by the nurse, as part of the comprehensive nursing assessment the participants were asked do they incorporate opportunistic screening for AF into their assessment by taking a manual pulse.

The participants' responses to this question varied but an emerging theme of the use of electronic equipment as a first line measurement instead of hands on approach to care became apparent.

Manual pulse check

Three participants indicated that a manual pulse check was not part of their usual nursing practice one participants stating that nurses are relying on equipment to detect a problem:

'To be honest, no except if there was an indication for it' P3: line 22.

'So if I am checking their blood pressure because that is the initial thing you would do when they come in here using the automatic blood pressure machine and you find sometimes the heart rate would be higher and sometimes it's lower so I would then palpate but other than that I wouldn't be palpating on everyone and at the same time as well I would be most suspicious with the older population' P3: line 26-30.

'I have to say with the use of the equipment and how advanced they are at the moment with the dinamaps and telemetries we have been steered away from manually checking everyone. There would be something that would trigger with us to check it manually as in a very brady tachy pulse, we wouldn't rely on the machine

reading we would check it then but initially they would have to be something there to alarm us'' P4: line 17-21.

This participant in particular emphasised that manual pulse checks are not routinely carried out as part of a nursing assessment:

'Manual pulse checks aren't routinely done. I think we rely a lot on the dinamaps but obviously if somebody if you are not quite sure that it is not making sense you would check manually or obviously if it is reading very high or very low sometimes you don't trust in the dinamaps you would check it and obviously if your ECG was showing an afib as well you would want to check it manually just for your own' P5: line30-34.

'I think we rely on technology a lot and especially in the medical unit the minute they come in and they have cardiac symptoms we pop them on a monitor straight away so kinda technology takes over and we kinda take a step back. So we are relying on the ECG, we are relying on the cardiac monitors and we are relying on echoes and everything, more so we should be checking it ourselves' P5: line 36-40.

The issues of triage or nursing assessment of patients was raised by two participants, one emphasised that she does not do a manual pulse check but again goes first for electronic equipment in form of ECG.

'We triage everyone that comes in through A&E first of all. The nurse in charge triages all of them and every patient if they come in with a headache or it doesn't matter what they come in with we do an ECG on everyone coming in so that would be our screening method. If they come in with something different we can pick up stuff on ECGs' P1: line 22-25.

When this was explored further with the participant when asked,

'So if something flagged to you during your assessment then you might do it but you wouldn't routinely check somebody's pulse manually?' (line 30).

'No' P1: line 31.

In contrast to above, one participant described manual pulse check as part of her normal nursing assessment and routine, this highlights that individual nursing practices coexist in the AMAU.

'I suppose in my head it's not particularly afib but as I do a lot of triage and stuff down in AMU everyone's pulse I palpate just because it's just something I have got into to a habit of and I always remember being trained to palpate their pulse at the start of the shift so you always know if anything has happened so then you have baseline. So I would always palpate and try and teach the students to do that to but it doesn't always happen' P2: line 24-28.

Electro Cardio Graph (ECG's)

All the participants described how if an irregularity in pulse was detected during their nursing assessment that they would go on to carry out an ECG, the ability to recognise AF on an ECG varied among the participants

'I would do ECG' P3: line 36.

'An obvious one I would (recognise) mostly a fast one as well I would but other than that I normally have a doctor have a look at it because you can miss a fast one' P3: line 39-40.

'Yes we would do a 12 lead ECG and connect them up to cardiac monitoring because sometimes patients skip in and out of these irregularities so to try and catch them as well we would try and leave them on a monitor' P4: line 30-32.

Although this participant would carry out the ECG recording they did highlight their lack of ability to interpret the ECG.

'Yeah we definitely need to be more on the ball with that. I think we do need further training in it (ECG rhythm recognition) to be honest but I definitely do think that it would be our duty to be able to recognise that' P4: line 39-41.

With regard to interpreting ECG's there was a vast difference between the participant's ability to read an ECG and when to seek medical advice to have the patient reviewed,

'Obviously if I was looking after the patient I probably run off an ECG there and then and I probably pop him on a cardiac monitor if we have one and alert one of the doctors. Now if they were fast afib that's a whole different ballgame, you would have to get them seen as possible but if they were rate control, obviously I would alert one of the doctors but it is not as much as an emergency as fast a fib' P2: line 30-34.

'Yeah, I would be fairly comfortable that I would be able to recognise a fib' P2: line37.

This was in contrast to one participant who stated that she would not know how to read the ECG, she justified this by stating that other nurses and doctors would be present to read it.

In addition, she acknowledged that training in this area is important:

'Personally I wouldn't know how to recognise it. I wouldn't be very good at ECG interpretation but there is other nurses who are very well equipped who would understand but we always show our ECGs to a doctor anyway so I wouldn't be

concerned in that sense but yes definitely it would be great if we did have more knowledge about ECG interpretation because we kinda only fly over it during training and that's a long time ago for me but definitely it is something we need to know P5: line 43-48.

One participant stating again the reliance on machines to highlight a problem or issue, but she expressed confidence in her ability to recognise AF and alert medical staff:

'I would, yeah I would, you know it would tell you on the top anyway and we have everyone's cardiology on our monitors as well, so it alarms as well to tell you but I would know P1: line 37-38.

Overall the data from this thematic area indicates that different nursing practices in relation to the nursing assessment of patients and carrying out manual pulse checks exists in the AMU abilities an over reliance on electronic equipment seem to be prevalent to detect an irregularity instead of a detailed nursing assessment on risk factors. In relation to ECG's although nurses were able to carry out the task of recording one there was a failure among some of the participants to be able to interpret the findings.

Theme three - Prevention

In relation to stroke prevention in the setting of AF, the use of medications and risk assessment tools and barriers to anticoagulation was explored.

Anticoagulation.

All participants recognised that anticoagulant use was indicated in the setting of AF to reduce the risk of stroke:

'They would be on long term anticoagulants and depending on their comorbidities it might be dual therapy as well. There was Warfarin but that seems to be varying away from that now it's more the newer ones the Xarelto ones P4: line 76-78.

'I just find that a lot of people are been diagnosed with afib so you can't leave them untreated so it's under used if the people are not been detected and it wouldn't be necessarily over used, if they are found to have afib you have to treat it' P4: line 109-111.

'I definitely would be confident that I know most patients should go on anticoagulation for afib P2: line 65.

One participant recognised the need to assess patients and co morbidities when commencing anticoagulation therapy;

'I would but at the same time I would have to look at the whole medical issues of the patient, it might not be possible for them to go on anticoagulation depending on what their medical background is but sometimes the doctors have to weigh the risk of putting them on anticoagulate or not but in most cases that I have dealt with they would try and put them on anticoagulants unless otherwise indicated' P3: line 59-63.

However, one participant was unsure about the role of antiplatelets (aspirin) in stroke prevention

'I am aware of the anticoagulants that are out there as in specifically to prevent a stroke' P1:line 76. 'Well I suppose it (aspirin) would be thinning blood anyway but I don't know whether it would be a good one to use' P1: line 80-81

Assessment tools.

Three of the participants were aware of risk assessment tools, however they were not something used in their nursing practice (CHADS-Vasc and HASBLEED tools).

'Well I know there is the Chads Vasc and Chads Vasc 2, I don't know a whole load about them but I certainly know they do use them to see if someone is a candidate for coagulation and what type of coagulation they should be on. They are the main two I would know off' P2: line 50-52.

One participant stated that the CHADS-Vasc was not used by nurses, but that if ANP's were appointed this practice might change, they differentiated between the role of the nurse versus Advanced Nurse Practitioner versus doctor instead of empowering herself with the knowledge:

'I've heard the doctors talking about the chads vasc but for nursing practice we don't use it. Now that might change now that we are getting our ANPs candidates they might try and bring something in the unit but I am familiar with the term now that you say it that the doctors use but the nursing staff do not use that' P5: line 76-79.

'I have heard of it' P3: line 87. 'So those are tools we can use?' P3: line 95.

All of the participants felt empowered to advocate for patients if the situation arose for anticoagulation use:

'in our unit someone seems to automatically be put on anticoagulation so I don't seem to really need to advocate, I've never really had to advocate for someone to go on anticoagulation' P2: line 68-70.

'Yeah I have no problem confronting a doctor and questioning "do you think they need to go on anticoagulation" P4: line 91-92.

'100%. When they come to MAU it's for a full assessment so you are not giving them a full assessment if you don't highlight these things. So if I find it in the notes I would highlight it straight away and obviously if an ECG had been done already then they might want another one and you are going to check their pulse, manual as well P5: line 139-140.

Barriers to anticoagulation/ falls.

When the question of barriers to anticoagulation was discussed the subtheme of falls emerged among the participants as a reason not to commence anticoagulation.

'if I don't think they should as in I think that they are very high fall risks or they have had GI bleeds. They would be the things that it would be very risky to go on' P2: line 67-68.

'when I do see people coming on afib and they are not on anticoagulation but they are on Aspirin, I wonder why and usually there is a reason, they've been on that before and they have reacted to it or they have had a fall before and it was just too high risk or other than that usually there is some reason why they are not most of the time' P2: line 111-115.

As this participant had mentioned falls more than one time, this was explored more to gain an insight to their level of knowledge of falls and risk as a reason not to anticoagulate a person with a diagnosis of AF where anticoagulation is recommended;

'In relation to falls and it does come up over again, would you have any idea what the number of falls in a patient would need or a person would need to have in a year to make them not eligible for anticoagulation' Interviewer: line 116-118.

'Ballpark maybe 3 or 4' P2: line 119.

When they were informed of the actual number of falls that would need to occur in a year which is one a day every day their response was

'its not as much as a risk as you would think' P2: line 126.

One participant indicating the risk of a haemorrhage associated with falls as a potential barrier to anticoagulation

'Well if they're a falls risk that they would have a haemorrhage' P1: line 86.

This participant recognised that the use of warfarin maybe more prudent in an older adult due to the fact of having a reversal agent, weighing up the risk versus benefits;

'Especially in care of the elderly, I think sometimes they may try Warfarin v the newer agents sometimes because you can reverse the Warfarin. Obviously if somebody was at risk of falls it puts a huge caution in giving somebody risk v benefits' P5: line 108-110.

'if they had one (fall) that would be enough to reassess everything' line 115.

Again when this participant was informed of the number of falls per year their response was

'that's huge, I'm very shocked about that' P5: line 119.

Overall the data from this thematic area highlighted that participants recognised the need for anticoagulation therapy to reduce the risk of stroke in AF, although their knowledge about the specific oral coagulants was lacking especially in the area of the new direct oral

anticoagulants. The use of stroke and bleeding risk tools was something not carried out by the nurses and they seemed to be surprised that they could use them. One of the surprising subthemes that emerged was to do with the lack of knowledge in relation to falls and its use as a barrier to commence a person on oral anticoagulation.

Theme four - Work environment

The positive work environment and a strong sense of team work was evident from the participants' response to questions, with all participants saying that the medical team were always present to review patients or interpret findings if they were unsure or unable to read ECG's, and also where they are eager to learn more.

Teamwork

'We would be quite inclusive in that we all have quite relationship with the doctors and the consultants that way so we would encouraged' P2: line147-149.

'well the environment we are coming from as well, because there is doctors on, so anything that is flagged or anything that shows up or if there is anything showing up on the monitors we know there is a doctor there on site' P1: line 104-106.

'I would go to the medics to discuss my findings I would not want to jump the gun and go in and say you need something in case that they have something else and the patients ends up confused P3: line 118-120.

Educational needs

All the participants acknowledged that their unit is very progressive but acknowledged that there is a need for education in relation to the recognition of AF and assessment tools

'It wouldn't do any harm to know a bit more about the CHADS- Vasc and the HASBLED and all that goes around that as well but just to be able to tie it in with AF while profiling the patient as well and been able to read ECG' P4: line128-130.

'I think it would great if you could come back maybe tell us more about CHADS and HASBLED Score' P3: line123-124.

One participant eluded to the use of automation to develop auto sets that would again raise an alarm if something was wrong;

'auto sets that we do, they have very specific pointers on different things, so something like that would be very handy that you could then say right, like we have the ones for the headaches and they break it down into when the alarm bells have to be ringing for different settings. Something like that in relation to afib would be very helpful' P1: line126-129.

One participant was eager to increase her own knowledge and enhance her own practice;

'it's come up a few times in the acute medical unit where we would like to have a better knowledge of ECG interpretation. I know we have a doctor with us all the time but it would be nice for us to know for our own practice what the rhythms look like are and maybe some more up to date training on the newer anticoagulants' P5: line 147-150.

Another participant was able to recognise knowledge gap and training deficit among her more junior colleagues, while confident in her own abilities;

'I suppose for me I would be pretty confident when I palpate a pulse to know whether it's afib or not. I would be pretty confident whether it's afib or not on an ECG. I say for some colleagues, maybe my junior colleagues maybe a little general training on what afib looks like on an ECG, definitely more training on palpating of pulse, definitely more education on the anticoagulation and why it is so important' P2: line 131-135.

'I have diagnosed a few new afibs myself, just palpating their pulse, it feels like afib and I would be confident in that and I am a total believer of why wouldn't we be confident enough to do that' P2: line 143-145.

The overall finding from this thematic area was that when nurses reflected on their own practice they were able to recognise the gaps in their knowledge and were eager to address them and learn new skills such as ECG training, the use of risk assessment tools etc. the MAU is a proactive environment where upskilling and teamwork is evident.

Summary of findings

Nurses have an invaluable role to play in the care of patients, in order to prevent patients from having a disabling or fatal stroke because of an underlying diagnosis of AF, it is important that nurses have an adequate knowledge of AF, identify patients who are at risk of having undiagnosed or asymptomatic AF and target these patients for opportunistic screening in the AMAU setting. The next chapter will integrate the main thematic areas that emerged from the data of this study with the relevant literature.

Chapter 5 - Discussion of findings

Introduction

This chapter will discuss the key findings of the study and integrate them with the relevant literature. The findings of the four themes are discussed in detail. This study indicates the importance of nurses being knowledgeable and educated in relation to AF, the stroke risk associated with AF and the use of risk assessment tools when deciding on the use of anticoagulation in the acute setting.

Theme one – Understanding AF

Lack of knowledge about AF has been identified in studies as an important issue that should be addressed (Koponen, et al., 2007; Lane et al., 2006; McCabe, et al., 2008). 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), highlighting a gap in patient care and missed opportunities to provide education on AF.

All of the participants in this study stated that they knew what AF was most of them describing it as a quivering, fast irregular heart beat that can cause clot formation. When asked if they felt confident in the ability and level of knowledge to be able to explain a diagnosis to patients, they all stated that they had a basic knowledge and would be able to explain the condition, however they did say that they required more education, which was similar to the research findings of Ferguson (2016), their study identified poor knowledge and practice in the areas of AF and anticoagulation.

Recognition of AF in symptomatic patients did not pose a problem for nurses in this study, all participants were able to identify the common symptoms associated with atrial fibrillation – palpitations (sensations of a racing, uncomfortable, irregular heartbeat or a flip-

flopping in your chest); weakness, reduced ability to exercise, fatigue; light-headedness; dizziness; shortness of breath, but they were unaware of the asymptomatic population and risk profile associated with this population.

Asymptomatic AF poses a significant health problem, data from recent studies indicate that not only does asymptomatic AF (also known as occult or subclinical AF) increase the risk of stroke, but it is also much more prevalent than previously thought (Healey et al., (2015); Xiong et al., (2015); Keach et al., (2015)).

Asymptomatic AF is diagnosed in 20% of patients who present with acute stroke, and on average stroke due to AF are more severe. The actual prevalence and risk of subclinical AF remains unclear; AF is often undetected until after a patient experiences an ischemic event. A meta-analysis of thirty-two found an overall detection rate of 11.5% in patients not known to have AF, therefore, a considerable number of people may unknowingly be at increased risk of a disabling or potentially fatal stroke (Kishore et al., 2014).

In relation to understanding that there is an increased stroke risk associated with AF all participants expressed that they knew of the association and that being on anticoagulant therapy reduced that risk. However, from the research reviewed gaps were found in patient's knowledge about AF and increased stroke risk, (Koponen et al., 2007; McCabe et al., 2008; Lane et al., 2006) if nurses were educated and became more knowledgeable they would in turn be in a position to fill this void and increase patients understanding of AF, the stroke risk associated with the condition and how anticoagulation and adherence to the treatment can reduce the risk of a devastating stroke.

Theme 2 – Nursing Assessment

All of the nurses working the AMAU carry out a routine nursing assessment/triage for review, on every patient admitted to the unit. The nursing process is used as the basis of their assessment; assessment, diagnosing, planning, implementation and evaluation of an episode of care. As stated the nursing process involves a problem-solving approach to care and once a problem is identified nurses can intervene and evaluate in a systematic way for the purpose of reducing and preventing health related problems and promote patient's adaptation to the problem identified (Tanner, 1987).

To ensure that all patients with AF, and in whom its appropriate, receive interventions to reduce their risk of stroke, there is a need to improve AF detection rates before a serious complication arises.

By incorporating a single time-point screening of a targeted population i.e. those over a defined age or those with high risk comorbidities, as part of their routine nursing assessment in the AMAU in could provide the best chance of identifying patients with AF who were previously undetected.

Various strategies of screening for AF has been discussed in the literature, looking at both opportunistic screening and screening programs. The introduction of national screening programs would be costly and depend very much on every nations health care policy as screening needs to be linked to a pathway for management (Freedman, 2017).

Smyth et al (2015) in their study looking at opportunistic screening in primary care setting in the west of Ireland, a substantial number of new cases were detected. It was hoped that after the completion of the study which ran for six months that a change in practice would be encouraged and that GP's and nurses would continue to check for irregular pulse

amongst their patients, which occurred as 86% and over. This demonstrated that change in practice can occur when it's a quick non-invasive intervention.

Holding et al., (2009) carried out an audit of data in a nurse led rapid access AF clinic, they found that over a third of those who attended the clinic were referred there as a result of an incidental finding of AF, these patients were otherwise asymptomatic and many of those were detected as a result of a simple pulse check. More importantly over half of those identified with AF were at high risk of stroke when assessed for their suitability for anticoagulation.

All nurses and doctors are trained in manual pulse recording however carrying it out in practice is not mandatory, the introduction of technology has led to the healthcare setting becoming more efficient and advanced, the field of nursing has adapted along with these advances. The introduction of automated blood pressure machines has reduced the opportunity for nurses to carry out a manual pulse check, this was found in this research where only one nurse stated that she routinely carried out a manual pulse check, the other participants stated that they would only do so if the machine alarmed or abnormal reading was detected on the machine. It's important to know if the automated blood pressure machines being used have the capability to carry out screening to detect pulse irregularities, and nurses should be aware if this is the case.

As healthcare provides we must be cognizant of the fact that no technology in health care replaces the critical thinking of a human mind, the caring and compassion of a human, the proficiency and skill of a human hand, and the warmth of a human heart in healing the sick and injured (Robinson, 2003). A simple non-invasive pulse check can be done as we greet our patients, introduce ourselves and ask the patients how they are feeling?

Welton et al (2017) carried out a systematic review into screening strategies for AF and a cost-effectiveness analysis looking at both opportunistic screening when a patient attended their healthcare provider (GP) or systematic population screening found that systematic opportunistic screening was more likely to be cost effective than systematic population as long as practices that was carried out during the research trial carried on and translated into normal practice. They also found that modified blood pressure monitors or nurse pulse palpation was more likely to be cost-effective than other screening tests.

The findings in this study concur with other study findings in relation to the missed opportunities by healthcare workers to carry out opportunistic screening in both the asymptomatic and at risk population, the introduction of electronic equipment has taken away the hands on approach to care.

Theme three – Prevention

The prevention of stroke in the setting of AF revolves around the use of oral anticoagulation. Anticoagulation reduces the risk of AF related stroke, randomised controlled trials have consistently demonstrated that long-term anticoagulant prophylaxis reduces stroke risk in patients with AF (Fuster et al., 2006; Lip et al., 2010; Lip et al., 2011). A formal meta-analysis of five primary prevention trials detected a 68% reduction in risk for stroke with warfarin therapy versus placebo over an observational period of nearly 3,700 patient years (De Caterina, 2009; Hart et al., 2007). However, anticoagulation is underused by physicians, consequently, many patients with AF live with an avoidably elevated risk of stroke (Amin, 2013, Ogilvie et al., 2010).

The risk of stroke increases along with AF as patients grow older, even when no other stroke risk factors are present (Fuster et al., 2006). However, generally, the age-related increase in

stroke risk is attributable to a higher prevalence of AF-related predisposing conditions, as well as conditions that are associated with increased stroke risk but independent of AF (Roger et al., 2012).

When identifying patients at risk of stroke from AF, the CHA₂DS₂-Vasc score is a risk assessment tool widely used (Appendix V), thus identifying those patients likely to benefit from anticoagulant to protect against stroke, particularly for patients at lower and intermediate stroke risk levels (Amin 2013).

In addition to risk stratification scores that offer a means of identifying patients likely to benefit from anticoagulation, other tools, which calculate the risk of major hemorrhage during anticoagulant therapy, may add to further consideration when selecting which patients to offer anticoagulation and the precision of the medication chosen. HAS-BLED is one bleeding risk score tool commonly used (Appendix VI).

Participants in this study only had a vague knowledge of the risk assessment tools used to calculate both stroke risk in AF and identify those who should be offered anticoagulation therapy the CHA₂DS₂-Vasc and a bleeding risk assessment tool HAS-BLED, they felt it was a doctors role to use these tools however the researcher believes that if nurses detected a new diagnosis of AF in their patients that completion of these assessment tools will allow nurses to complete a full and thorough nursing assessment using the nursing process, and then refer the patient on for medical review and assessment.

To improve detection of AF and thus prevent stroke healthcare providers need to identify opportunities in clinical practice to be proactive in screening for AF.

Theme four – Work environment

To deliver a high quality health care requires teamwork. Putting individuals together from different disciplines does not guarantee the creation of a team, a team needs a shared vision, a system of collaboration. To form a productive, efficient team a positive cohesive work environment requires a knowledge base, interprofessional leadership, the use of best evidence based practice and individuals who are prepared to be collaborative and effective team members (Weiss et al., 2018).

Working within a interprofessional healthcare team each member has to recognise the power, the strengths and limitations of their unique professional expertise and their personal qualities, they must accept the responsibility of actively contributing to the team to deliver safe, effective and quality health care to patients (Weiss et al., 2018).

All participants stated that they worked in a unit where they felt supported and always had a doctor present to who they could seek assistance, and advice from. They all felt that they could advocate for their patients when discussing patients with the medical team.

Acute medical units provide immediate and early specialist management of adults patients who present to or from within the hospital as urgencies or emergencies (RCOP, 2007). Commonly encountered conditions in acute medicine include ischaemic heart disease, venous thrombo-embolism, cardiovascular disease, acute infections, complications of medical conditions associated with diabetes and respiratory illness and cardiac arrhythmias (Casey et al., 2016).

The documented benefits of acute medicine include early detection of deteriorating patients, improved access to diagnostics, early senior decision making and intervention,

improved pathway and patient flow, reduced length of stay and hospital admissions and improved patient experiences and staff satisfaction (Casey et al., 2016).

In their development framework document supporting Nursing Practice Skills and Competencies in Acute Medical Assessment Units (AMUs) and Medical Assessment Units (MAU) in Ireland, Casey et al., state that the overall purpose of the framework is to 'provide guidance and support to enable nurses identify, develop and maintain the necessary skills and competencies to deliver quality, safe and holistic care and services to acute medical patients in an evolving specialism'.

Conclusion

Key findings from this study indicate that nurses caring for patients in the MAU setting need to be competent in the rapid assessment, nursing diagnosis, initial treatment and discharge of patients working as a team member guided by the expertise of colleagues. Simple changes to current nursing practices and increasing the knowledge of AF, the treatment and management options will enable nurses to provide a comprehensive and high quality of care to their patients.

Chapter 6 – Conclusion

Introduction

This study aimed to explore the nurse's knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulant use in preventing a stroke. a qualitative approach was used for this study, interviews were carried out with nurses working in an acute medical assessment unit to examine their current level of knowledge of AF, their awareness of the use of risk assessment tools in the setting of AF and anticoagulation use in preventing a stroke.

AF is the most commonly occurring cardiac arrhythmia and is a risk factor for stroke, it is an emergent health concern, described by some as an evolving epidemic, health care providers will need to be prepared to meet the growing demand for effective care of patients with AF, there is a need for comprehensive AF prevention and management strategies (Ball et al., 2003, Lane et al., 2017).

A patient's stroke risk can be reduced through timely early identification and diagnosis of AF and application of evidence-based treatment. Evidence-based care ought to be positioned in the context of the best available evidence, it's also important to consider the clinicians/nurse own experience, and carrying out a patient assessment and tailoring a plan to suit an individual's needs. Translating evidence into practice is a major challenge in healthcare (Greenhalgh, 2010).

The translation of evidence based knowledge into practice is an approach designed to improve healthcare delivery, it requires the interaction of clinicians/nurses with their patients and/or caregivers to identify needs and barriers when developing and applying an individualised plan of care in order to promote evidence based care (Gagliardi et al., 2011).

There is evidence to support that informed, educated and supported patients who are involved and engage in their own healthcare have better outcome (Gagliardi et al., 2011).

AF is a burdensome and common condition where treatment is complex and not without risk, nurses will meet individuals with AF across a variety of primary and acute care areas, and they need to understand the risk of AF, be familiar with evidence based and appropriate therapies.

This study showed that the nurses had a basic knowledge of AF, they were aware of the stroke risk associated with AF and the need for anticoagulation therapy in preventing a stroke. however, it also demonstrated that they were significant gaps in the depth of knowledge in AF thus impacting on the ability to educate patients about the condition, there was also gaps in clinical practice evident as the nurses did not use risk assessment tools for stroke risk in AF, and they did not routinely carry out manual pulse checks on patients, with an over reliance on the use of technology to diagnose a condition was evident.

Contribution to knowledge

This study adds to the limited published literature with regard to nurses' knowledge of AF, stroke risk and anticoagulation, however, it is envisaged that it will contribute to nursing knowledge by providing nurses views on the risk of stroke with AF. It found that nurses had positive attitudes towards their area of work, they felt they worked in a supported environment where good interprofessional team work was evident and they felt that a high quality of care was given to patients in their care. This was an excellent opportunity to highlight the importance of having an in-depth knowledge of common conditions that present to AMAU, AF being one of these common conditions. Nurses need to be up to date and aware of current evidence based treatments and recent advancements in the area of

oral anticoagulation. The findings of this study concur with other studies and highlights a need for ongoing education and training particularly in the area of opportunistic screening at point of contact by carrying out a manual pulse check and which population of patients should be targeted, the use of risk assessment tools and update on new oral anticoagulant medications.

Implications for Practice

This study showed that the nurses had a basic knowledge of AF, they were aware of the stroke risk associated with AF and the need for anticoagulation therapy in preventing a stroke. However, it also demonstrated that they were significant gaps in the depth of knowledge in AF thus impacting on the ability to educate patients about the condition, there was also gaps in clinical practice evident as the nurses did not use risk assessment tools for stroke risk in AF, and they did not routinely carry out manual pulse checks on patients, with an over reliance on the use of technology to diagnose a condition was evident. Nurses working in the AMAU will need to become more knowledgeable and educated in all aspects of AF and stroke prevention in relation to the detection, assessment and onward referral of patients presenting to their unit. As nurses are often the first point of contact they need to be in a position to provide a holistic nursing assessment and on ward referral to appropriate specialist services or senior medical review within the department.

Limitations of the study

The study sample was small with only five participants who were interviewed from one unit. In addition, the novice nature of the researcher is acknowledged particularly in the early stages of the data collection process. However, despite this being a small study its findings

have an important implication for enhancing nurses clinical practice in an acute medical assessment unit.

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Appendix I

Dear Director of Nursing,

I am currently a Clinical Nurse Specialist in Stroke Care in GUH, and am currently undertaking a Masters in Health Science (Advanced Practice) in NUIG. In part fulfilment of this programme I am required to complete a research project.

I have chosen to explore nurses' knowledge of patients stroke risk in relation to atrial fibrillation and anticoagulation use in preventing stroke. To conduct this study, I propose to utilise a qualitative methodology approach, to include semi-structured interviews with nurses working in the Acute Medical Assessment Unit.

I am writing to you to seek permission to carry out this study.

I have obtained ethical approval from the hospitals ethics committee.

Anonymity and confidentiality of the participants will be protected at all times. Furthermore, any future publication of the research findings will not identify the participants or the organisation in any way.

I would be most grateful for your permission to conduct this research. A copy of the research proposal is included.

Should you require any further information, please do not hesitate to contact me on XXX.

Yours Sincerely,

Trish Galvin.

Appendix II

Consent Form and Participant Information Sheet

Thank you for showing interest in participating in this study. I would like to invite you to take part in an interviewat.....

Please could you read through this consent form which will give you more details about the purpose of the study and a description of what is involved. If you are happy to proceed please sign the form and return it to me in the stamped addressed envelope provided.

If you have any questions about this form or the study please contact me and I would be happy to talk with you.

If you agree to participate I will contact you nearer the time to confirm your attendance, but if you find you are unavailable to attend I would be grateful if you could tell me at the earliest opportunity.

Thank you again for your interest in this study.

Please read and complete the following form.

Title of Study: To explore Nurses knowledge of patients stroke risk in relation to Atrial Fibrillation and anticoagulation use in preventing stroke

Investigator:

Institute: NUIG

Study Purpose: This study is undertaken as part of the requirements for a Masters in Health Sciences (Advanced Practice)

The study aims to discover:

What level of knowledge exists among nurses working in an acute medical unit in relation to the stroke risk associated with atrial fibrillation (AF).

Study Methods:

You will be invited to participate in a one to one semi-structured interview. An audio recording will be made of the discussion but your anonymity and confidentiality will be assured. The interview will last no more than one hour.

The interview will take place at a location convenient to you and refreshments will be provided.

Possible risks or benefits:

There is no known risk involved in this study. It is envisaged that the finding of this study will increase awareness of the stroke risk associated with atrial fibrillation. It is also an opportunity for you to voice your opinions about how this might be done to the advantage of nurses and patients. Formal education programmes for nurses may be delivered as a result of this study.

Right of refusal to participate and withdrawal:

You are free to choose to participate in this study. You may refuse to participate or withdraw anytime from the study without any prejudice or adverse effect.

All information you supply during the research will be held in confidence to the extent provided by the law. Any information from the audio recording during the interview will be stored securely in a locked file until it is destroyed after the research (a period of 5 years).

Additional Information:

If you have any questions about the study, please contact me at..... and I will be happy to discuss it with you.

This study has received ethical approval from..... If you have any queries regarding this please contact.....

Participants' Consent Declaration:

I understand that participation is voluntary. Refusal to participate will involve no penalty. I understand that I may discontinue participation at any time.

Participant's Signature: _____

Participant's Name: _____

Date: _____

Investigator's Declaration: I have explained and defined in detail the research procedures in which this person has consented to participate.

Investigator's Signature: _____

Date: _____

Appendix III

Questions for semi – structured interview.

Can you explain to me in your own words what Atrial Fibrillation is?

Can you tell me what the symptoms of AF are?

What is your knowledge of asymptomatic AF?

As part of your daily assessment of patients do you carry out a manual pulse check?

What does AF feel like on a manual pulse check?

If you found an irregular pulse what would you do?

Can you recognise AF on an ECG?

Do you think it is within your scope of practice to be able to recognise AF?

Before today were you aware of the risk of stroke associated with AF?

Where did you learn about this?

What do you know about strokes caused by AF?

Are you aware of any tools that calculate stroke risk in AF?

CHADS VASc, HASBLED

Treatment options for AF?

Rate control, Rhythm control

Anticoagulant use as stroke prevention measure?

Do you think you would be comfortable explaining AF and providing education to patients diagnosed with AF?

What do you think you require in relation to education and training to make you more confident and competent when dealing with AF?

Appendix IV

Letter of ethical approval

Clinical Research Ethics Committee
Room 59
1st Floor
HR Building
Merlin Park Hospital
Galway.

17th October, 2017.

Ms. Trish Galvin
Clinical Nurse Specialist
Department of Stroke Medicine
University College Hospital
Galway.

Ref: C.A. 1856 - To explore Nurses knowledge of patients stroke risk in relation to Atrial Fibrillation and anticoagulation use in preventing stroke

Dear Ms. Galvin,

I have considered the above project, and I wish to grant Chairman's approval to proceed.

Yours sincerely,



Professor B. Gerard Loftus
Chairman Clinical Research Ethics Committee.

c.c. Ms. Phil Noone, Lecturer in Nursing Gerontology, Department of Nursing & Midwifery, National University of Ireland, Galway.

Ospidéal na h-Ollscoile, Páirc Mheirlinne, MERLIN PARK UNIVERSITY HOSPITAL,
Galway, Ireland. Tel: 00 353 (0)91 757631

Appendix V

CHADS2-VASc Scoring Tool

Risk factors	Score	CHADS2-VASc score and Annual stroke risk (%)
Congestive heart failure	1	Score 1 = 1.3
Hypertension	1	2 = 2.2
Age > 75 years	2	3 = 3.2
Diabetes mellitus	1	4 = 4
Stroke/TIA/systemic embolism	2	5 = 6.7
Vascular disease	1	6 = 9.8
Age 65 to 74 years	1	7 = 9.6
Sex (female)	1	8 = 6.7
		9 = 15.2

Appendix VI

HASBLED Scoring Tool

HAS-BLED bleeding risk score

Letter	Clinical characteristic ^a	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

^a'Hypertension' is defined as systolic blood pressure >160 mmHg. 'Abnormal kidney function' is defined as the presence of chronic dialysis or renal transplantation or serum creatinine $\geq 200 \mu\text{mol/L}$. 'Abnormal liver function' is defined as chronic hepatic disease (e.g. cirrhosis) or biochemical evidence of significant hepatic derangement (e.g. bilirubin $>2 \times$ upper limit of normal, in association with aspartate aminotransferase/alanine aminotransferase/alkaline phosphatase $>3 \times$ upper limit normal, etc.). 'Bleeding' refers to previous bleeding history and/or predisposition to bleeding, e.g. bleeding diathesis, anaemia, etc. 'Labile INRs' refers to unstable/high INRs or poor time in therapeutic range (e.g. $<60\%$). Drugs/alcohol use refers to concomitant use of drugs, such as antiplatelet agents, non-steroidal anti-inflammatory drugs, or alcohol abuse, etc. INR = international normalized ratio. Adapted from Pisters et al.⁶⁰

Score ≤ 3 indicates low bleeding risk, score > 3 high bleeding risk.