Primary prevention of cerebrovascular accident (stroke)

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Abstract

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Abstract

Cerebrovascular accident, stroke, has become a global burden with high mortality and disability rate. Thus, effective primarily prevent stroke including lifestyle changes and medication treatment is well-documented as significantly impact on reducing stroke occurrence. Beside that nurse play an essential role in helping patient prevent stroke through education and appropriate nursing interventions. However, nurse's role in primary prevention of stroke are limited in research outcomes.

The aim of this thesis is to determine the methods of primary prevention of cerebrovascular accident by literature review. The purpose of this thesis is to provide knowledge related to the primary prevention of cerebrovascular accidents to nurse and nursing students in an effort to clarify the role of nurses in primary preventative care of disease. This thesis has two main questions regarding this issue: What are the methods of primary prevention of cerebrovascular accident? What is nurses' role in primary prevention of cerebrovascular accident?

Inductive qualitative data analysis is used in this study is method. The research databased was utilized through PubMed, LAB Library and Google Scholar. There are totally 8 articles were chosen and analysed which are relevant to the main topics. Primary prevention methods and nursing intervention are main two themes which was found though data analysis.

Lifestyle modification and adherence medication treatment are well-documented as effective ways in primary prevention of stroke. Nurses contribute positively in primarily preventing Cerebrovascular accident occur. Nurse has vital role as leader, manager, researcher, educator in stroke prevention. However, there are many challenges in real-life that they have to face and resolve while doing in stroke prevention field.

Keywords

Cerebrovascular accident, stroke, risk factors, primary prevention, nurse's role.

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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
AF	Atrial fibrillation
AHA	American Heart Association
ASA	American Stroke Association
BP	Blood pressure
COPD	Chronic obstructive pulmonary disease
CVA	Cerebrovascular accident
CVD	Cardiovascular disease
DBP	Diastolic blood pressure
DM	Diabetes mellitus
SBP	Systolic blood pressure
SCD	Sickle cell disease
STEMI	ST- Evaluation Myocardial Infarction

1 Introduction

Cerebrovascular accident (CVA), or stroke is a condition where the brain is seriously damaged by the interrupted or greatly reduced brain blood supply, that causes the brain to lack of oxygen and not having enough nutrition to feed the cells. There is not enough blood supply, withing minutes brain cells will begin to die. One can completely recover from stroke, or it can lead to dead if it is not treated immediately (Tadi & Lui 2021.) The National Institute of Neurological Disorders and Stroke states that stroke is also brain attack – a sudden stoppable blood supply to part of brain. A stroke happens when the clot obstructing the flow of blood to brain or blood vessels rupturing and preventing blood flow to brain. It is a medical emergency when “time is brain”, the longer waiting, the more brain cells will die. (NIH 2020.)

Stroke has always been an urgent medical problem leaving many sequelae and a burden on the family and society. According to World Stroke Organization (WSO) there are over 13.7 million stroke cases every year. Globally 25 percent of people over age 25 will have a stroke in their life (in both gender and all age). There are over 80 million people in the world who have experienced a stroke while living and 2.5 million fatalities from stroke annual year. (Lindsay et al. 2020.) The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) states that there were 5.5 million deaths by stroke worldwide in 2016. In 2021, stroke was the second reason causing disability-adjusted life-years worldwide in both the 50-74 years and 75 years and older age groups (Lanas & Seron 2021).

The most common risk factors are hypertension. The other risk factors include age, gender, smoking, diabetes, obesity, high-cholesterol level, stress, and intoxication. Preventing stroke is the most effective methods to alleviate the consequences of health and economy of patients. (WSO 2016.)

Healthcare professionals, especially nurses are in the key role to help patients understand what a cerebrovascular accident (stroke) is, develop an awareness of the risk factors for stroke, provide essential knowledge as well as lifestyle advice, support people to reduce smoking, promote healthy eating and regular exercise to prevent the appearance of this disease through education. Preventing risk factors and stroke occurrences are the most effective method to alleviate the consequences of health and economy of patients. (Clare 2019.)

The aim of this thesis to determine the methods of primary prevention of cerebrovascular accident by literature review. The purpose of this thesis is to provide knowledge related to the primary prevention of cerebrovascular accidents to nurse and nursing students in an effort to clarify the role of nurses in primary preventative care of disease.

2 Cerebrovascular accident

2.1 Definition

Cerebrovascular accident broadly can be classified into two main types: ischemic infarction and intracerebral hemorrhage (Wittenauer & Smith 2012; William et al. 2010). Ischemic stroke is the most common and accounts for about 87% of total strokes which includes thrombotic stroke and embolic stroke. Thrombotic stroke is caused by the blood clot (thrombus) forms in an artery which can have fatty deposits, called plaques. A blockage by blood clot that forms somewhere in the body (usually the heart) and travels to the brain. A common source is an irregular rhythm in the upper two chambers of the heart (atrial fibrillation), which can cause blood clots to form. (Wittenauer & Smith 2012.)

Hemorrhage means bleeding thus hemorrhagic stroke is caused by weakened vessels that burst and bleed into the surface of the brain. This condition increases pressure on surrounding brain tissues, eventually rupturing brain vessels. It represents up to 13% of stroke cases. There are two main categories of hemorrhagic stroke: intracerebral hemorrhage and subarachnoid hemorrhage. (ASA 2020.) Image 1 represents the two main types of cerebrovascular accident (stroke).

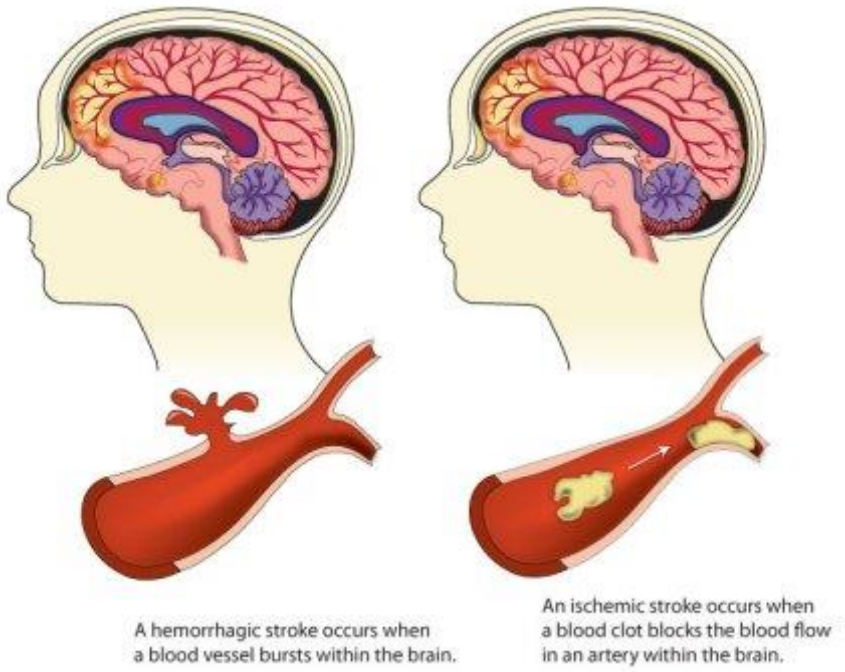

Image 1 Type of stroke (CDC.GOV 2021)

Furthermore, Transient Ischemic Attack (TIA) is as known as a mini-stroke but is a significant warning sign of stroke in the future. TIA is caused by a temporary decreased in blood supply to part of the brain. Hence it does not cause noticeable long-term damage and should

be evaluated by the physician right away. (ASA 2018.) The neurological deficit lasts for over 24 hours that is known as a stroke. Nevertheless, any neurological deficit last for less than 24 is classified as a transient ischemic attack (TIA). (Hurford et al. 2019.) TIA may last only few minutes or disappear less than 20 min that why many people totally no attention to them (NIH 2020).

2.2 Risk factors

Early identification the modifiable risk factors is extremely important because they play role in intervention strategies to prevent and reduce these factors can successively reduce the cerebrovascular accident in the future. Modifiable factors are varied and can divide into lifestyle behavior factors and medical factors. There are diverse modifiable stroke risk factors includes hypertension, smoking, diabetes mellitus, hyperlipidemia, cardiac causes, physical inactivity, excessive alcohol consumption. (Boehme et al. 2017; Wittenauer & Smith 2012.) Especially, hypertension or high blood pressure is one of the significant leading causes of cerebrovascular accident. Hypertension management through medication and lifestyle changes is the most effective way to reduce stroke. Hypertension damages blood vessels, causing them to burst or clog more easily. Strokes are much more likely to occur if having weakened arteries in brain resulting from high blood pressure. (AHA 2016.) Microvascular and macrovascular changes caused by diabetes can result in major clinical complications, one of which is stroke. As a result of hyperglycemia, stroke risks are increased (Chen et al. 2017). Additionally, drinking excessively, substance abuse, and smoking are associated with an increased risk of ischemic and hemorrhagic strokes (Boehme et al. 2017).

The most remarkable non-modifiable risk factor of the cerebrovascular accidents is age, as every decade after 55 years old, the risk factor increases double for both men and women (Morrison 2014). Women tend to have longer life span than men as well as risks related to pregnancy, gestational diabetes, and hormonal factors (for example, oral contraceptive use), etc. For this reason, women have greater strokes than men. Furthermore, race and ethnicity are known as risk of stroke, African Americans and Hispanics have higher ratio than Caucasians. (Boehme 2017; ASA 2021.) Family history is also a noteworthy risk factor, especially if a family has member has had stroke before. Genetic susceptibility as well as familiar environment and lifestyle have been proven to rise the risk of stroke. (Polikandrioti 2009.)

2.3 Symptoms

Lack of knowledge on recognition signs and symptoms of cerebrovascular accident or actions to be taken during it has occurred often lead to the stroke-related morbidity and mortality. The National Institute of Neurological Disorder and Stroke (NIH) recommends that everyone should learn to recognize the following signs of a stroke, which includes sudden numbness or weakness of the face, arm, or leg, especially on one side of the body; sudden confusion, trouble speaking or understanding, sudden trouble seeing in one or both eyes, sudden trouble walking, dizziness, loss of balance or coordination; sudden, severe headache with no known cause. (NIH 2021.) Furthermore, difficult swallowing (dysphagia) is also concern as symptom of stroke (Suomalaisen Lääkäriseuran Duodecimin ja Suomen Neurologinen Yhdistys ry, 2020).

2.4 Primary prevention

In general, diseases can be prevented on three levels: primary, secondary, and tertiary. Primary prevention of disease starts by preventing the onset of health problems by following a healthy lifestyle and getting vaccinated before they arise. Secondly, preventing disease from getting worse is achieved by intervening when it has already begun but before symptoms have manifested. A tertiary prevention strategy is the management of disease after diagnosis in order to limit or stop disease progression. Individuals are primarily or secondarily prevented in most prevention guidelines. (Kisling & Das 2021.)

Research in this study concentrated on primary preventing cerebrovascular accidents as a priority. A healthy lifestyle, which includes a balanced diet, regular exercises, moderate alcohol consumption and no smoking, has been shown to significantly reduce the risk of multiple chronic diseases, especially cerebrovascular accident. (Chiuve et al. 2009.) The American Heart Association/ American Stroke Association (AHA/ASA) provides the updated guideline for stroke prevention, highlighting the importance of healthy lifestyle as one the essentials key to preventing disease. In particular, maintaining regular physical activity as well as a nutritious diet, quitting smoking and losing weight are strongly recommended. (Rundek & Taneike 2021; Meschia et al. 2014.)

2.4.1 Healthy diet

Globally, health risks are most commonly associated with unhealthy diets and a lack of physical activity. A nutritious and balanced diet is necessary factors contribute to good health, prevent malnutrition as well as the non-communicable diseases (NCDs) like diabetes, heart disease, stroke, cancer, etc. (WHO 2020.) According to the National Nutrition

Council, eating at regular intervals, such as five times a day, can help to stay healthy. The regular consumption of meals helps to maintain blood glucose levels, control hunger, and improve weight management as well as protect teeth from decay (Finnish Food Authority, 2021). Keeping energy intake (calories) in balance with energy expenditure is extremely important to avoid overweight and obesity. An individual of a healthy weight consumes about 2000 calories per day. For additional health benefits, the recommended amount should be less than 5% of total energy intake. (WHO 2020.)

Carbohydrate, or carb, is known as the main source of energy for body use. It can be found in many different foods such as grains, fruits, daily products, starchy vegetables, etc. The “good” carbohydrates are great choice for beneficial health which are high amount of fiber and nutrients, reduce sugar consumption from foods and prevent many chronic diseases such as type 2 diabetes and heart diseases. Unrefined whole grains (e.g., whole wheat, oatmeal, brown rice,), non-starchy vegetables, legumes (e.g., kidney beans and peas,), nuts and fruits are known as healthy carbohydrates for human sources energy. (WHO 2020; Finnish Food Authority 2019.)

Healthy fats is an necessary nutrient for human growth. It is one of three main sources of energy, which has more than double of many calories per gram as carbohydrates and protein, 1 gram of fat include 9kcal. Fats has essential role in body that function in brain development as well as structural component of cells and especially help body to absorb the fat-soluble vitamin A, D, E, K. (NHS 2020.) Saturated fat is unhealthy fat that can found in meat and daily product, sweet and savory and plant oils. Food consumption that contains high saturated fats, increase the level of cholesterol in blood and main leading of obesity, heart disease and stroke. (ASA 2021.) Thus, reduce fat consumption, particularly saturated fat and industrially produced trans fats is highly recommended. There are many ways to reduce fat such as limit meet products and red meat should not more than 500g, use poultry meat and eat fish at least two or three times per week. Moreover, nut and seeds are great sources of unsaturated fat, are recommend using 30g per day or 200-250g per week. (Finish Food Authority 2021.)

Furthermore, fruits and vegetable provide variety types of vitamin and minerals that is sources of phytochemicals that role as antioxidants, phytoestrogens, and anti-inflammatory agents and through other protective mechanisms (Slavin & Lloyd 2012). It is recommended that eating at least 400g or five handfuls of vegetables, berried and fruits everyday in order to decrease the risk of NCDs and provide sufficient dietary fiber. Avoid getting high amount of sugar, whole raw berries and fruits are preferred than juicing them. (Finnish Food Authority 2019; WHO 2020.)

Sodium intake mainly come from salt but also can be found in sodium glutamate, which is used commonly in diet worldwide. High sodium intake is more than two grams, comparable to 5 grams salt per day and inadequate potassium intake is less than 3.5 gram per day increase high blood pressure and rise the risk of cardiovascular diseases and stroke. Hence, The World Health Organization is strongly advocated that adult should use less than 5 grams of salt (under a teaspoon) per day. (WHO 2020.) There are many ways to reduce salt consumption in daily intake for example reduce to add salt while cooking by replacing with variety herbs, spices, salt-free seasoning, and fruit juices; limit to eat the high-salt foods such as ham, bacon, sausage, salted nuts, snacks, etc; eat more often whole fresh food and vegetables than processed and fast foods (WHO 2020; Finnish Food Authority 2019; CDC 2020).

Stay hydrated is an important factor contributing to healthy life. Different people require different amounts of fluid intake per day. As well as the liquids provided by foods, it is recommended that all the healthy adults consume liquids in quantities of 1-1,5 liters or 5-8 glasses a day. (Finnish Food Authority 2021.) As a well-established source of body fluid for preventing dehydration, regulating body temperature, lubricating joints, water is the best and most essential (CDC 2021). Water is not only beverage choice, however, and many of these can be an essential part of a healthy diet: herbal teas, coffee, low-fat milk, plant milk, for example (CDC 2021; Finnish Food Authority 2021).

2.4.2 Physical activity

The importance of physical activity in the primary and secondary prevention of a number of chronic diseases such as cardiovascular disease, stroke, incident type-2 diabetes, cancer, hypertension, obesity, depression, osteoporosis and premature deaths is evidence demonstrated (WHO 2020; Warburton et al. 2006). Physical activity should be a regular part of all adults' lives. It is highly recommended for people aged 16-64 years to do 150–300 minutes of moderate-intensity aerobic physical activity a week or 75–150 minutes of vigorous-intensity aerobic physical activity, or equivalent combination activity, throughout the week, for significant health benefits. Exercise is available in many forms, such as playing a game and playing sports, walking, running, swimming, doing housework and doing other daily activities. It is advisable to do moderately to highly intense muscle-strengthening exercises for adults such as dancing, cycling, hill walking, climbing stairs, etc., twice a week with a moderate to high intensity. Furthermore, regular physical activities for older people aged 65 years and over can be done safely which depends on their abilities and conditions. Any activities are greater than doing nothing even it is light activities, for example, walking or moving around, cleaning, standing up, etc. (WHO 2020; AHA 2018.)

2.4.3 Smoking and alcohol management

According to the World Health Organization, the epidemic of tobacco is one of the severe public health problems worldwide, it leads to 8 million deaths per years all throughout the planet. Direct tobacco use is killing over than 7 million people and second-hand smoke is the consequences of more than 1.2 million deaths of non-smokers. (WHO 2021.) Smoking significantly rise the risk of coronary heart disease, stroke, lung cancer, diabetes, etc. To be more precise, risk of coronary heart disease and stroke increase by 2 to 4 times because of smoking. (CDC 2014; Shad & Cole 2011.) It is strongly advised to stop smoking which is a crucial positive change for health. Not only reduce risk factor of cerebrovascular diseases, cancer and other smoking-related diseases, smoking cessation also bring huge benefit for health, maintain, and improve life's quality. (CDC 2020; WHO 2016.)

According to the American Heart Association, limit alcohol is one of the important factors that maintain and improve a healthy life which reduces risks of heart diseases, ischemic stroke, diabetes, liver cirrhosis, mental issues, etc. Moderate alcohol intake is better than overuse, which is defined as one to two drinks for men and one drink for women a day. Basically, one drink is known as 12-ounce regular beer, 5 ounces of wine or 1.5 ounces of 80-proof spirits. (AHA 2019.) Although low or moderate consumption of alcohol is cardio-protective, studies have shown that it may also protect against other risks such as alcohol dependency, collateral social harms, genetic vulnerability and even cancer (Chiva-Blanch & Badimon 2019).

2.5 The role of nurse in primary prevention of cerebrovascular accident

In order to improve quality healthcare for the population, health professionals provide crucial services that promote health and prevent diseases. As such, nurse is primarily an educator who provides information and guidance to populations so as to promote healthy lifestyles. (WHO 2021.) Patient education is one of the most essential roles of nurse in primary prevention of illness. So, in cases of cerebrovascular accidents, the nurse's responsibility is to encourage patients to adopt a healthy lifestyle by engaging in physical activities and balanced diet as well as reducing tobacco and alcohol consumption. Besides, nurses also motivate high-risk people to take preventive medication, for example, antihypertensive, anticoagulant, lipid-lowering drugs, etc. Furthermore, by planning and delivering health promotion intervention, nurse raises awareness of risk factors to reduce stroke occur in the future. (Corcoran & McCullagh 2018.) Nurses are not only educators but are also researchers in

primary prevention of stroke. They evaluate current preventive services and research development to enhance stroke prevention services better. In addition, nurses serve as clinical leader and manager in stroke prevention. (Clare 2019.)

3 Aim, purpose, and research questions

The aim of this thesis is to determine the methods of primary prevention of cerebrovascular accident. This study is done in a form of literature review.

The purpose of this thesis is to provide knowledge related to the primary prevention of cerebrovascular accidents to nurse and nursing students in an effort to clarify the role of nurses in primary preventative care of disease.

This thesis has two main questions regarding this issue:

1. What are the methods of primary prevention of cerebrovascular accident?
2. What is nurses' role in primary prevention of cerebrovascular accident?

4 Methodology

4.1 Theory about literature review

Clarifying the definition of literature review contributes importantly to the performance of thesis work. Lauren A. Maggio stated that a literature review forms the basics for high-quality medical education research and helps maximize relevance, originality, generalizability, and impact. Hence, good research has relevant research questions and use the clear method for research questions. (Maggio et al. 2016.)

The amount of medical knowledge in Nursing field is huge and increasing day by day. For this reason, literature review is good way to comprehensively summary and analyse thoroughly of research topics. The literature review is considered the “gold standard” because they attempt identify appraise and synthesize all empirical evidence that meets specific inclusion criteria to answer a highly focused clinical question. (Smith & Noble 2016.)

Literature review includes finding relevant sources such as journals, scholarly books, authoritative databases, primary sources, etc. The process of conducting a literature review could be step-by-step from design of review with purpose, specific research questions, conducting the review, analysis and finally structuring and writing the review. (Snyder 2019.) There are various databases to search for relevant sources but LAB library, Google Scholar, EBSCO, Medline are useful and common databases to search for medical nursing field.

4.2 Data search and collection

Relevant keywords were utilized to conduct literature search across several databases in order to discover specific topics of interest for this thesis. The keywords used were cerebrovascular accident, stroke, risk factor, primary prevention, and nurse’s role in prevention of stroke. Literally, stroke is more common word in research databases than Cerebrovascular accident even both are known as the same. Hence, both keywords were used to research for gaining more relevant results. The use of inclusion and exclusion criteria aids in the identification of the work's topic, which were applied in this study to collect more relevant information. Many different factors are used as inclusion and exclusion criteria such as date, language, type of publication and articles.

A selection process was carried out including inclusion and exclusion criteria. Published articles are limited to those written within the last 10 years, ensuring the research results are current and up-to-date. Only English materials were used for research since English is an international language which provides more relevant information worldwide and this study is also written down in English. Free full text availability is considerable as a priority

than paid articles as well as author save time and finance to access without register new account. Author freely used the appropriate materials by LAB University of Applied Sciences student account. To ensure consistency and update over time, scientific journals are more often chosen as research subjects than books. Furthermore, primary prevention refers to prevention strategies or treatment used for people without yet suffering a stroke or TIA, while secondary prevention is used to prevent strokes from recurring after a stroke or TIA is already occurred. Despite similarities between interventions for primary and secondary prevention, their approaches differ significantly. This study is mainly focus on primary prevention of CVA with lifestyle modification and risk-factor management. Table 1 demonstrates the inclusion and exclusion criteria that was used in the thesis.

Inclusion criteria	**Exclusion criteria**
Articles between 2011-2021	Articles before 2011
Language English	The other languages
Free full text availability	Paid articles
Scientific journals	Book
Primary prevention of cerebrovascular accident	Secondary prevention of cerebrovascular accident

Table 1. Inclusion and exclusion criteria

For data collection, LAB Library, PubMed, and Google Scholar online databases were utilised. LAB Library has reliable and diverse official research databases of LAB University of Applied Sciences. PubMed is a free accessing database that was built from The United States National Library of Medicine (NLM). This database includes various topics about medical research, which provides biomedical research from MEDLINE, life science journals, and online books. (PubMed Overview 2021.) Especially, PubMed is a convenient tool to help researchers choose the relevant articles by using filters for text availability, article types, language, publication time, etc. Besides, Google Scholar is also known as a common research database where be able to freely access the scholarly literatures. In addition, since CVA and stroke are similar, but stroke is more common word in several databases, so CVA and stroke are used as keywords in research.

Database	**Search words**	**Found articles**	**Used articles**
PubMed	Primary prevention of stroke guideline	43	2
	Stroke and lifestyle	232	3

LAB Library	The role of nurse in stroke prevention	9090	1
	The role of nurse in cerebrovascular accident prevention	496	0
Google Scholar	The role of nurse in primary prevention of cerebrovascular accident	18500	2

Table 2. Data search

PubMed and LAB Library are more convenient than Google Scholar since they have variety filters to collect the relevant articles. Google Scholar is limited by only time arrange filter, information is soft by relevant or date, and include patents or citation. For this reason, the found articles in Google Scholar were much more many times than research in another database. There is total 8 articles that were collected and analyzed to clarify the primary prevention as well the role of nurse in prevention CVA. Each article selected for analysis has been carefully read and researched by the author. In fact, there are limitations in the articles regarding the role of nurses in stroke prevention, articles are more common with the general role of nurses in the preventive healthcare system for another different chronic diseases.

4.3 Data analysis

An inductive approach for qualitative data analysis is presented, along with specific about the assumption and analysis procedures. The purpose of inductive research is to condense extensive and raw data into a brief, summary format, organize the connections between research objects and the summary finding based on raw data, and make a model or theory about of the raw data based on underlying patterns. Various research purposes can be achieved by using the general inductive approach which provides an efficient and convenient means of analysing qualitative data. (Thomas 2013.)

After collecting from variety of sources by asking general question of the phenomenon, the inductive process of qualitative data analysis included open coding, creating codes, and establishing themes. Burnard.P stated that open coding was used to read each transcript work by word and line by line, meaning that the researcher reads each transcript and take notes beside the most important words or sentences. It is necessary to explain and name

these themes. Finally, the written report must demonstrate a clear analysis, so that the reader can comprehend the process and results. Figure 1 demonstrated the procedure of inductive qualitative content analysis. (Alanazi.A et al. 2017.)

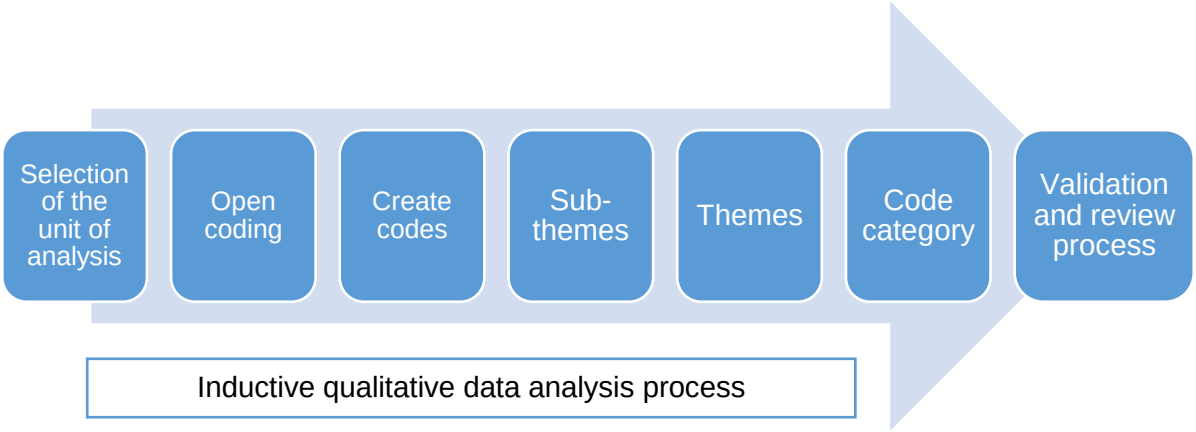

Figure 1. Procedure of inductive qualitative content analysis

Recently, Cardiovascular disease prevention are being studied widely, especially about stroke. In spite of this, there were difficulties with relevance of articles since there were very few studies utilized about the role of nurses in primary prevention of CVA. Accordingly, there are 8 articles as relevant to primary prevention and the nurses' role in primary preventive care of CVA. Each article has been thoroughly, and several times read. Thereafter, codes have been created and collected to modify into themes. Two major themes of the study are primary prevention of CVA and nurses' roles in primary prevention. In this first theme, primary prevention methods of stroke prevention are emphasized. Codes converted to this theme mainly focus on lifestyle behavior modification and medication therapy for high-risk patients. In the second theme, nurses play an important role in primary prevention of CVA by implementing clinical interventions and improving nursing professionals' knowledge and skills.

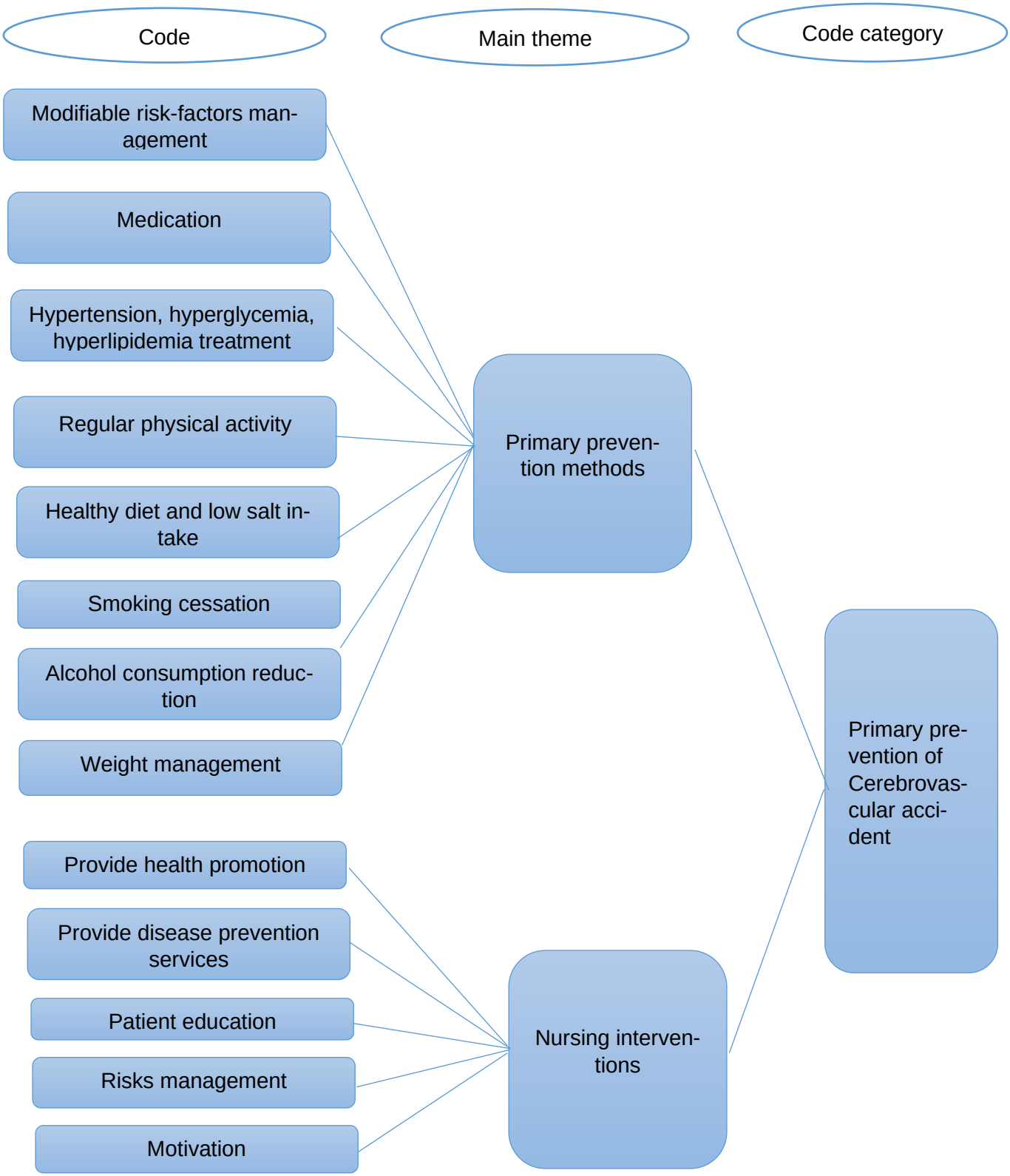

Figure 2. Main themes and codes

5 Results

5.1 The recommendation primary prevention of CVA

Globally, cerebrovascular accident, or stroke, is one of the top causes of mortality and major disability. Moreover, strokes are costly both for health care resource usage and in their impact on those who suffer from them and their families. Primary stroke prevention of evidence-based is subsequently important and necessary as it helps to prevent stroke from occurring, promotes health quality and reduces the stroke's global burden. Prevention strategies at times require specific adaptations based on whether it is an ischemic stroke, TIA or hemorrhage stroke. The prevention of stroke primarily involves lifestyle changes including healthy diet, regular physical activities, quit smoking and limit alcohol and treating risk factors such as high blood pressure, diabetes mellitus and lipid disorders. (Diener &Hankey 2020.)

5.1.1 Lifestyle changes and risk factor management

It is well known that eating a healthy diet can help prevent severe diseases such as cardiovascular disease, stroke, obesity, and diabetes. The results of multiple studies have implicated a wide range of factors related to diet in the pathogenesis of hypertension, the major modifiable risk factor for ischemic stroke. In particular, dietary risk factors that are causally linked to elevated BP are excessive salt intake, low potassium intake, excessive weight, excessive alcohol consumption, and a suboptimal dietary pattern. As for a healthy and balanced diet, fresh fruit and vegetables, plant-based proteins, low saturated fat, and cholesterol dairy products, as well as a sodium intake approximately 2300 mg per day are advised. (Niewada & Czlonkowska 2014.) For example, Dietary Approaches to Stop Hypertension (DASH) diet is suggested which in variety of fruit, vegetables and whole grains, fat-free or low-fat dairy products, fish, poultry, beans and nuts, etc. Limiting processed and high-sodium foods is strongly recommended. (Meschia et al. 2014; Niewada & Czlonkowska 2014; Diener & Hankey 2020.)

Physical activities have long-term health benefits that help to promote health, prevent several physical and mental diseases such as cardiovascular disease, stroke, obesity, stress, and depression, etc. Regular physical activities and exercises is demonstrated to remarkable decreased risk of ischemic and hemorrhagic stroke. Healthy adults are strongly recommended to do at least 40 minutes per day, three to four day per week of moderate or vigorous-intensity aerobic physical activity. Physical activities are not only doing exercise such

as walking, swimming, running, play sports but also including spare-time activity, occupational activity, and studying. (Meschia et al. 2014; Niewada & Czlonkowska 2014; Diener & Hankey 2020.)

Cigarette smoking is one of the evidence-based modifiable risk factors of stroke incidence. Direct and second-hand smoke expose have negative effect on vascular system, which increase atherosclerosis development and risk for ischemic and haemorrhagic stroke. At the results, quitting smoking or reduce maximum to expose to cigarette smoking environment, which significantly decrease the risk of stroke and others health issues, for examples, cancers, lung diseases, COPD, diabetes mellitus, etc. Smoking cessation can be accomplished through behavioral therapy and pharmacological aids (nicotine replacement therapy, bupropion, cysteine, or varenicline). (Meschia et al. 2014; Niewada &Czlonkowska 2014.)

According to The National Institute on Alcohol Abuse and Alcoholism defines heavy drinking as excessive consumption of alcohol by a man as more than 4 drinks per day (or more than 14 drinks per week); and heavy consumption by a woman as more 3 drinks per day (or more than 7 drinks per week). One standard drink is known as 12 ounces of regular beer, 5 ounces of table wine, or a 1.5– ounces shot of 80-proof spirits. Consequently, excessive alcohol consumption is leading to many kinds of serious physical and mental health complications, including hypertension, ischemic and haemorrhagic stroke, hypercoagulability, reduced cerebral blow flow and atrial fibrillation (AF). Therefore, limiting alcohol consumption is important to reduce risk of stroke and other serious diseases. Alcohol intake is recommended that should not more than 2 drinks for man and 1 drink for non-pregnant women per day. (Meschia et al. 2014, Diener & Hankey 2020.)

5.1.2 Blood pressure management

According to the American Heart Association, it is well established that hypertension is one of the most important and modifiable stroke risk factors, and that treating hypertension can reduce both ischemic and haemorrhagic strokes. The benefit of hypertension treatment for preventing stroke is clear regardless of age, including adults over 80 years of age. Patients with hypertension should undergo regular blood pressure measures and be treated appropriately, including using lifestyle modifications and medications. Prehypertension patients with SBP of 120 to 139 mmHg or DBD of 80 to 89 mmHg is recommended also screen BP regularly and change to healthy lifestyle. Antihypertensive medication is used to treat for patient who have hypertension, which target to control BP under 140/90 mmHg. Blood pressure management effectively is the main key to decrease risk of stroke and treatment should be individualized based on patients' conditions and drug resistance. (Meschia et al. 2014.)

Since 1948, the Framingham Heart Study has been conducting prospective epidemiological studies to identify causes of cardiovascular disease and develop prevention strategies. After six decades, the result of this project has shown that hypertensive individuals with BP over 160/95mmHg displayed five to 30 times higher stroke risk than those with normal BP (<140/90mmHg). In a Finnish study of 4,333 men and 5,270 women aged 45 to 64 years, none of whom had vascular disease, the risk of heart disease, stroke, cardiovascular disease, as well as overall mortality at 15 years of follow-up increased with increasing pulse pressure regardless of delta blood pressure level. Similarly, several studies have the same evidence about the relationship between hypertension and the risk of stroke development. For this reason, mild to moderate BP with SBP optimal value is under 140mmHg or between 120 to 139mmHg, is demonstrated that preventing stroke as well as other cardiovascular diseases. Moreover, antihypertensive drugs including beta-blocker and calcium channel blockers are concerned as effective drugs to treat high blood pressure. (Gaciong et al. 2013.)

In the study concerning the issue of stroke primary prevention, it is stated that stroke has been linked to hypertension as the main leading risk factor. If a hypertension patient has a BP higher than 160/90 mmHg, the stroke risk was increased to 52%. In several studies, the relationship between reducing BP and decreasing stroke accidents has been evaluated. Based on Girerd and Giral's findings, for example, each 2 mmHg reduction in blood pressure was associated with a 25% lowered risk of stroke. Hence, lowering blood pressure is one of the most important methods in primary prevention which help reduce the occurrence of stroke. (Endres et al. 2011.)

5.1.3 Diabetes mellitus management

Diabetes mellitus (DM) is associated with a higher risk of atherosclerosis and causes increased blood lipid levels and hypertension. In addition to being a stroke risk factor, diabetes mellitus is a major contributing factor. Diabetes mellitus doubles the risk for stroke. Microvascular complications are reduced by improved glycaemic control, but no evidence exists that improved glucose control reduces the risk of incident stroke. Patients with diabetes mellitus is strongly recommended to use statin for diabetes treatment as well as reduce the risk of first stroke. Furthermore, blood pressure management should achieve target of less than 140/90mmHg for DM patients. Using aspirin is indistinct evidence for stroke prevention primarily with patient whose have DM without 10-year risk of CVD. (Meschia et al. 2014.)

5.1.4 Hyperlipidaemia management

Results of several articles have shown that high cholesterol levels are related to increased risk of all types of strokes. On the contrary, High-density lipoprotein (HDL) cholesterol is known as “good” cholesterol, which has evidence to reduced risk factor of CVA. The relationship between stroke and increased triglyceride has less clear evidence but high triglycerides is known as a modifiable and impossible independent risk factor for stroke. An HMG coenzyme – A reductase inhibitors (Statin) is a primary method of preventing ischemic stroke among patients who have a high 10-year risk for cardiovascular events, according to guidelines. For patients with hypertriglyceridemia, fibric acid derivatives may be considered as well as patients with low HDL may benefit from Niacin but there are no proof that they prevent ischemic stroke. (Meschia et al 2014; Endres et al. 2011; Diener & Hankey 2020.)

5.1.5 Atrial Fibrillation

Atrial fibrillation (AF) is linked to an increased risk of ischemic stroke due to embolism of stasis-induced thrombi occurring within the left atrial appendage (LAA). The risk factor for stroke, AF, can be diagnosed and treated before the stroke occurs. Thus, AF effective treatment contribute significantly to stroke primary prevention. Nevertheless, a challenge remains to determinate which treatment offers the most beneficial balance between benefits and risks for a specific patient. Besides, increasing the public awareness, taking suitable anticoagulation for AF patients is recommended, particularly among the elderly. It is generally recommended to use warfarin at an adjusted dosage in patients at high risk for cardioembolic stroke and those with an acceptable risk of haemorrhagic complications, particularly intracranial haemorrhage. Warfarin administered at an appropriate dose (target INR, 2 to 3) is found to protect against stroke, virtually eliminating the excess risk of ischemic stroke associated with AF. Optional oral anticoagulants include Warfarin and three new anticoagulants (Dabigatran, Apixaban, and Rivaroxaban) have been approved to use for nonvalvular AF patients in prevention of stroke. The combination of Aspirin and Clopidogrel or Aspirin alone is beneficial protection against stroke in patients with AF who are unable to use anticoagulants. However, both all anticoagulants, antithrombotic and antiplatelet medication should be considered during use since they can lead to high-risk of bleeding. Moreover, in the choice of antithrombotic agent, patient risk factors, cost, tolerability, patient preference, potential interactions, and other clinical features should be taken into account, including time in therapeutic range for warfarin-taking patients. Furthermore, in primary care, pulse assessment followed by an ECG is a useful method for detecting AF in patients who are older than 65 years of age. (Meschia et al. 2014; Diener & Hankey 2020.)

5.1.6 Other cardiac conditions

Many other cardiac conditions are known related to develop risk-factor for stroke, include myocardial infraction (MI), ischemic and nonischaemic cardiomyopathy, valvular heart disease, patent foramen ovale (PFO) and atrial septal aneurysms (ASAs), cardiac tumours and aortic atherosclerosis. Despite well-reasoned consensus opinions regarding stroke prevention in many of these conditions, randomized, prospective trials are often lacking to support these conclusions. However, according to American Heart Association recommendations in primary prevention of stroke, it is demonstrated that anticoagulation may be considered for patient with severe mitral stenosis, an enlarged left atrium, or with STEMI (ST-Elevation Myocardial Infarction) and anterior apical akinesis or dyskinesis. In heart failure patients without AF or a previous thromboembolic event, anticoagulants or antiplatelet agents can be useful. Beside that the administration of vitamin K antagonists may benefit for patients with STEMI and asymptomatic left ventricular mural thrombi. Furthermore, surgical intervention is suggested to treat of atrial myxomas as well as symptomatic fibroelastomas. (Meschia et al. 2014.)

5.1.7 Sickle Cell Disease

Sickle cell disease (SCD) is an inherited blood disorder, in which red blood cells have an unusual shape, stiff and inflexible, which cause severe painful and can block blood vessels. Hence, stroke is one of the most severe complication of SCD, occurring most frequently in young children. Transcranial Doppler (TCD) ultrasound detects children at high risk for stroke so that they may receive transfusion therapy. In spite of a lack of an optimal screening interval, TCD remains the most efficient risk assessment method available. In addition, the use of hydroxyurea and bone marrow transplantation might be reasonable when children at high risk for stroke are unable to take periodic red cell transfusions. (Meschia et al. 2014.)

5.2 The role of nurse in primary prevention of CVA

5.2.1 Nurse as a leader

Nurses and other healthcare professional members play a critical role in supporting the goal of reducing death and disability from CVD, including CVA by 25% by 2025, according to the American Heart Association (AHA) and the World Health Organization (WHO). The nurses who take on a primary role as team leaders have proven their ability to reduce CVD risk factors in addition to adhering to treatment guidelines and protocols, diminishing hospitali-

zation, and declining morbidity and mortality among patients with established disease. Nursing interventions in primary prevention of stroke have effective impact on results in both developing and developed countries, which are shown in table 3. (Hayman et al. 2015.)

Nursing intervention	**Significant outcomes**
Optimize management of dyslipidemia	Improved measures of dyslipidemia
CVD risk reduction: lifestyle (diet and exercise)	10-year CVD risk reduction
Hypertension (5E program: Education, Engagement, Environment, Evidence, Evaluation)	Blood pressure, BMI, and weight reduction
Diabetes and hypertension	Blood pressure and diabetes improved
Smoking cessation (education, counseling, and follow-up)	Significant “quit” rate
CVD risk with medication counseling and management	Less CAD progression; all CVD risk factors lowered; decreased Framingham score
CVD risk management cost evaluation	Cost effective

Table 3. Nurse case management trials and Summary of Findings.

Many studies such as SCRIP (Stanford Coronary Risk Intervention Project), The Cardiac Hospitalization Atherosclerosis Management Program and EUROACTION have been proven that nurses importantly contribute to reduce risk factor of CVD and stroke by adherence evidenced-medical guidelines and lifestyle modification. In the Institute of Medicine report titled Promoting Cardiovascular Health in the Developing World by Dr. Fuster, it highlights the potential role of nurses and nurses in practice, research, and advocacy related to CVD and stroke prevention in children, adults, and family to diverse communities. Nonetheless, several health care challenges have impact primarily on the nurses’ leader in prevention of stroke such as distinct geographical and economic, the growing wealth gap, political strife, and the influence on geopolitical, social, and fiscal factors, especially shortage of nurses. Hence, nurse's leaders highlight the importance of patient-cantered care, promoting the role of nursing in risk-factor reduction as well as prevention of strokes, as well as managing quality improvement care services, using information technology and all of these functions can play an important role in preventing strokes. (Hayman et al. 2015.)

5.2.2 Nurse as an educator

Primary prevention of CVA strategy emphasizes to lifestyle changes and medication treatment for high-risk patient to minimize stroke or TIA occur. Personalized education approaches may be preferable to improve adherence to prescribed therapies and attitude towards positive lifestyle changes. Nurses are educator who play an important role in primary preventive care of disease, including stroke. Nurses educate patients about life behaviour modification and the potential medications that decrease risk-factor of stroke. Motivational interviewing framework is one of the most effective counselling methods to encourage patients in changing health behaviour, care management own-self and medication adherence. Motivational interviewing comprises four principles that lead to successful outcomes: identifying and understanding patients' motivations for change, listening with empathy and reflexion; empowering patient. Social media and digital may be beneficial in personalized patient education in future but it needs more research to recognize the advantage in motivating lifestyle changes. (Kim et al. 2015.)

In the references to study of Feigin et al., it is stated that despite stroke incidence and mortality rate have declined lightly in the world but are still a worldwide burden, indicating that more effective primary prevention strategies are needed. Health professionals, and especially nurses, are key members of the multidisciplinary stroke care team. In addition to providing specific health education, nurses are also responsible for understanding the views, values, norms, values, and beliefs of people of different races and ethnicities who are at risk for stroke in order to increase the effectiveness of prevention interventions. Nursing care helps individuals to become more aware of stroke risk through education, encouragement, and counselling to change to a healthy lifestyle, improve physical activity, reduce heavy drinking and smoking, and adhere to medication therapy. (Feigin et al. 2021.)

6 Discussion

6.1 Major findings

Despite CVA is globally burden with high rate of mortality and morbidity but it has been declined significantly though active effort in lifestyle modification and adherence medication. As a result of this literature review, lifestyle change and medication treatment for high-risk patients are emphasized as CVA primary prevention approaches. Stroke incidence has been associated to the numerous modifiable risk factors, including unhealthy diet, physical inactivity, heavy alcohol consumption, smoking, hypertension, hyperglycaemia, hyperlipidaemia, atrial fibrillation, sickle cell disease and other cardiac situations.

As a consequence of the long-term practice and upkeep of unhealthy habits, they directly affect patient's life, thus making lifestyle changes is not easy and involves many challenges. For this reason, altering a healthy lifestyle is an important, meaningful and beneficial task for both mental and physical health, especially for those at risk. Healthy eating habits include eating a variety of fruits and vegetables, limiting meat consumption, eating processed food, reducing fat and salt consumption, all of which play a critical role in preventing excessive weight gain, high blood pressure, stroke and many other diseases. Exercise is encouraged for all people, and each individual will select an exercise regimen suitable to their health status as well as their lifestyle. Exercise can take many forms like swimming, running, walking, yoga, gymnastics, playing sports, etc. In addition, Smoking is emphasized as a harmful habit with adverse health effects and can increase stroke occurrence, so it is crucial to stop smoking. Several studies have demonstrated how difficult it is to quit smoking, but behavioral therapy and pharmacological aids have been found useful in reducing and ultimately quitting smoking. Moreover, limiting alcohol consumption is recommended as a healthy lifestyle habit and positive effect on the prevention of stroke as well as other cardiovascular and mental diseases.

It is well documented that hypertension is one of the most serious risk factors for stroke and other CVDs. Due to its absence of obvious symptoms, high blood pressure is often ignored and not recognized. Measuring blood pressure regularly and taking antihypertensive medicine for hypertension are both considered effective measures to control blood pressure and prevent strokes. Besides, diabetes, hyperlipidemia, AF and other numerous cardiac conditions are evidenced modifiable risk factors of CVA, so taking prescribed medication, regularly check-ups and measurement and maintaining a healthy lifestyle will be helpful in diseases treatment and primarily prevent strokes in future. Especially sickle cell disease

(SCD), as it is usually detected at birth, can cause stroke as a serious complication. Therefore, children with SCD are at an increased risk of ischemic stroke and TIA. Sickle cell disease was mentioned only in a few studies related to studying primary prevention of CVA, however, it is an important modifiable risk factor of stroke need to be identified and treated effectively.

Nurses are essential key in stroke prevention team, who are responsibilities as a leader, manager, researcher, advocator and specially educator. However, the recent articles are rather limited in analysing specifically what nurses will do with each of their roles in stroke prevention field. In this study, the role of nurse as leader and educator are focused on. To be a successful manager and leader, nurse must be adept at human resource management, make appropriate decisions regarding a stroke prevention guideline plan, and inspire and motivate each member of the team so that they can contribute, contribute, and fulfill their potential. Furthermore, leaders should be able to show empathy, communicate and listen well to the opinions of other members, and resolve conflicts within the organization, to promote collaboration and solidarity. Patient education is proven as potential method in enhance stroke awareness, inspirate and motivate patient to change lifestyle and maintain it throughout the lifespan as well as increase the independence in patients' self-care in daily living. Hence, as an educator, the nurse needs to choose the appropriate educational methods for each individual, for example, according to socio-economic factors, educational level, and psychology, health history, track record of healthy lifestyle behaviours and hobbies, etc. Such methods will help to promote lifestyle change and maintain them for lifetime.

Besides understanding and recognizing the risk-factors that can lead to stroke, nurses also need to development their professional by actively learning day-by-day to improve their knowledge as well as practical experiences and skills to be able to help patients in better prevention of stroke.

Nevertheless, based on the result, primary prevention of stroke has many challenges to implement in real-life settings. For example, the barrier from misunderstanding from both nurses and patient in prevention strategies, nurses lack of knowledge about stroke and how they can do to help patient primarily prevent disease, nursing shortage or different about culture, social and belief factors, etc. Both of these factors have impact significantly in the effectiveness of stroke prevention.

The data research and collection process have many difficulties while finding the specific answers to questions about the role of nurses in the primary prevention of Cerebrovascular accidents. Recently the studies about cardiovascular diseases have been strongly considered so the results of the research have increased remarkably but it was limited in research

of nurse's role in CVA primary prevention. In various different databases such as PubMed, Google scholar or LAB library, "Role of nurse", "Cerebrovascular accident", "Stroke", "Primary prevention" are the main keywords used in research, but the outcomes were different, for example, "cardiovascular disease", "secondary prevention of stroke" and so on, it was not exactly and strongly relevant with the question "The role of the nurse in primary prevention of Cerebrovascular accident". Nevertheless, those chosen articles are read thoroughly several times and are relevant to the main topic of this thesis.

6.2 Ethical considerations

The Finnish Advisory Board on Research Integrity (TENK) provides RCR guideline for researchers on how to conduct responsible research to prevent research misconduct and is used at all university of applied sciences in Finland (TENK 2012). This study is written based on LAB University of Applied Sciences thesis guidebook bachelor's degree as well as follow strictly ethical guideline to prevent research misconduct including fabrication, falsification, plagiarism and misappropriation. The work's results of all researchers who are authors of all sources of information in this article are respected. All sources of results information are appropriated cited in each paragraph, List of References and in the appendix. Furthermore, the main findings are read several times, honestly evaluated an analyzed, without changing the meaning or results from articles. All work in the research process is followed with integrity, meticulousness and accuracy. The process of collecting, analyzing and evaluating data is clearly described, consistent with scientific criteria and ethical criteria. In addition, all the processes of this thesis are evaluated, monitored by the supervising teacher as well as given appropriate advice to avoid unexpected mistakes.

6.3 Validity and reliability

Due to the rapid development of current information sources, information is searched a lot and causes distrust, and it is not easy to determine the quality of the information source. Validity and reliability is one of the important factors when doing this thesis. Therefore, with the guidance of supervising teachers as well as guidance from LAB University of Applied Sciences, all the sources in this study are reliable sources of information. All search data sources are information from major health organizations such as World Health Organization (WHO), American Stroke Association (ASA), American Heart Association (AHA) and some other reputable medical data platforms such as PubMed, LAB libraries, Google Scholar. All information sources are read, analyzed many times, filtered to find relevant information to the main topic of this thesis. The process of data collection and analysis was carried out rigorously, they were started with keywords related to the topic of this thesis, for example,

“stroke”, “primary prevention”, “risk factors”, “role of nurse”. However, the search results show many differences, not related even though the title has the same keywords. In addition, cardiovascular disease and stroke are a large, important and increasingly popular topic, but research on the role of nurse in primary prevention is limited.

6.4 Suggestion for further research

The main findings in this thesis will be suggestions and a premise for more in-depth studies on the topic of CVA primary prevention and the role of nursing in stroke prevention. Follow-up studies may continue to investigate more deeply and specifically the role of nurses as to what work they will do to prevent stroke. Stroke and its complications are global burden, particularly on healthy systems, healthcare workers and individual patients. Although recently there are specific and comprehensive guidelines for primary prevention of stroke, there are still many barriers and challenges in implementing them in life, so that further research can support and provide specific solutions, which can be adapted to economic, social, cultural situations as well as health care system. From there, nurse will have more opportunities to fulfill their roles and responsibilities and increase effectiveness in stroke prevention.

7 Conclusion

Cerebrovascular accident, stroke, is a serious medical condition that causes serious damage to health is one of the leading causes of death and disability in the world. In the globalized world, stroke has a significant impact on individuals, health care systems, and national economies. As a result, primary prevention of stroke is known as one of the essential methods for preventing stroke and transient ischemic attacks. Preventing CVAs primarily involves lifestyle modification and prescribing medication to high-risk patients. In terms of healthy lifestyle and behavior, maintaining a healthy diet, doing physical actively, quitting smoking and reducing alcohol consumption are strongly encouraged. In addition, it has been documented that hypertension, hyperglycemia, hyperlipidemia, and atrial fibrillation and other cardiac conditions are modifiable causes of stroke. Therefore, regularly screening blood pressure, utilizing prescribed medication to treat these conditions, following -up health conditions as well as maintaining healthy lifestyles can significantly reduce the likelihood of CVDs, CVAs, and other health complications. Sickle cell disease is also recognized as a risk factor for stroke, which is why it is so necessary to detect this disease, use appropriate medications, and provide medical treatment for children to reduce stroke in children. (Meschia et al. 2014; Niewada & Czlonkowska 2014; Diener & Hanley 2020; Gaciong et al. 2013; Endres et al. 2011.)

The nursing profession is more than just a caregiver, it is a leader, manager, researcher, and educator with vital roles in preventing strokes. As a result of the efforts and contributions of nurses in stroke prevention, a positive outcome is evident in the reduction of strokes. Likewise, nurses play a vital role as leaders, as they make appropriate policies and decisions to increase effectiveness in stroke prevention, reduce barriers, as well as inspire each member of the nursing team to actively promote and contribute to the work. It is extremely important to help patients understand stroke including risk factors, signs and symptoms, complications, and specially how they can prevent stroke happens in their life. Therefore, nurses are educators who play a critical role in raising awareness among patients, maintaining a healthy lifestyle, and taking medication regularly in order to be more healthy and happier. Moreover, every nurse need to actively study every day and keep up with the updated knowledge and medical guidelines, thereby improving their knowledge and experience in prevention work. (Hayman et al. 2015; Kim et al. 2015; Feigin et al. 2021.)

However, based on the articles reviewed, it appears that the role nurses play is not quite clear, which may, in turn, lead to confusion and misunderstanding among patients and nurses about the process of stroke prevention. Furthermore, many other factors make the prevention of strokes ineffective, such as inadequate human resource availability in the

nursing profession, nurses with lack of knowledge and experience, cultural, socioeconomic differences, ineffective communication, and beliefs that create barriers and challenges for nurses and health systems. (Kim et al. 2015; Feigin et al. 2021.)

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Appendix 1. The summary of articles

Author(s), Year of publication Journal information	**Title of articles**	**The objectives of articles**	**Methodology used in the research**	**Main results**
Meschia, J.F., Bushnell, C., Boden-Albala, B., Braun, L.T., Bravata, D.M., Chaturvedi, S., Creager, M.A., Eckel, R.H., Elkind, M.S.V., Fornage, M., Goldstein, L.B., Greenberg, S.M., Horvath, S.E., Ladecola, C., Jauch, E.C., Moore, W.S., & Wilson, J.A 2014	Guidelines for the Primary Prevention of Stroke	Deliver comprehensive evidence-based recommendations for primary prevention of CVA in those having never previously suffered a stroke or TIA.	Literature review	Provide comprehensively primary preventive care of stroke guidelines which includes modified risk factors management by changing to healthy lifestyle and taking preventive medication. The evidence-based recommendations analyzed in many-type of risk factor of stroke and the effective treatment. Health professionals, nurses, provide health promotion and disease prevention services by giving lifestyle

				advice and guideline by education. Nurses also contribute to life changing by group visits or implement services to screening and prevent disease.
Niewada, M., & Czlonkowska, A. 2014	Prevention of ischemic stroke in clinical practice: a role of internists and general practitioners	Provide the knowledge about risk-factors and prevention methods for both ischemic and hemorrhage stroke. Both primary and secondary are mentioned in this study.	Literature review	Around 80% of stroke are associated with five most common cardiovascular risk factors which include hypertension, smoking, obesity, diet and irregularly physical activity. Lifestyle behavior changes are strongly recommendation in primary prevention of CVA. Moreover, medications related to stroke management are concerned in this article, for

				example, hormone therapy or oral contraceptive drug, NSAID, aspirin, etc.
Hayman, L., Berra, K., Fletcher, B., & Miller, N. 2015	The role of Nurses in Promoting Cardiovascular Health Worldwide: The Global Cardiovascular Nursing Leadership Forum	Recognize the role of nurses in prevention CVDs and stroke and emphasize role of nurse is as a leader.	Literature review	Nurses play a vital role as team leader in primary prevention of CVD and stroke, who provide case management, research and provide the appropriate guidelines in stroke prevention. However, there are many recent challenges in implementing prevent of stroke.
Diener, H-C., & Hanley, G. 2020	Primary and Secondary Prevention of Ischemic Stroke and Cerebral Hemorrhage	Focus on primary and secondary preventive recommendations to reduce death and disability among acute stroke patients, as well as prevent strokes	Literature review	Healthy lifestyle behaviors, effective management of hypertension, hyperglycemia, lipid disorder and antithrombotic are evidence methods to primary

		that occur for the first time or recur.		prevention of ischemic stroke Reducing high blood pressure and taking antithrombotic are modifiable methods to prevent cerebral hemorrhage. In stroke prevention, healthcare professionals, including nurses, have a vital role to play.
Gaciong, Z., Sinski, M. & Lewandowski, J. 2013	Blood pressure Control and primary prevention of Stroke: Summary of recent clinical trial data and meta-analyses	Hypertension is main leading to ischemic stroke or hemorrhage stroke. So, stroke risk can be minimized primarily by controlling high blood pressure by antihypertensive drugs.	Meta-analysis	Hypertension is the most significant modifiable risk factor of ischemic and hemorrhage stroke, both in those with and without cardio history diseases. Nocturnal hypertension, morning surge or increased variability predict an increased stroke risk, however,

				the evidence is provided which are not clear and disturbances. Antihypertensive drugs include beta-blockers and calcium channel blockers are considered as effective medication for hypertension in elderly.
Endres, M., Heuschmann, P., Laufs, U., & Hakim, A. 2011	Primary prevention of stroke: blood pressure, lipids, and heart failure	Review the evidence to present the role of hypertension and heart disease on risk-factor of stroke. Hyperlipidemia is concerned as one of risk-factor, but it is less clear. This study also show that stroke is one of complications of heart failure.	Literature review and meta-analysis	Lowering BP is potential methods reducing stroke happens. Healthy lifestyle and adherence are recommended in lowering BP. Besides, the evidence of lipid has impact negatively on stroke is not clear but maintain cholesterol in optimal level is advice. The stroke risk in Chronic heart

				failure is increased with age, hypertension and AF. Primary prevention of stroke is implemented in two approaches: high-risk patients and general population.
Kim, J., Thrift, G.A., Nelson, R.M., Bladin, F.C., & Cadilhac, A.D. 2015	Personalized medicine and stroke prevention: where are we?	Discuss advances in stroke prevention as well as presents an illustrative study that healthcare professionals and patients can face and can overcome based on personalized education approach.	Literature review	Personalized care has achieved better in goal of stroke prevention. Patient's preferences and values are considered as an important point of this method. Besides, emotional and physical support, education and participations of family and friend are recommended.
Feigin, L. V., Norrving, B., George, G. M., Foltz, L. J., Roth, A. G. & Mensah, A. G.	Prevention of stroke: A strategic Global Imperative	Review the newest stroke epidemiology literature and emphase the chal-	Literature review	Provide the "whole picture" about stroke and CVD are globally burden and provide

2021		lenges and provide upgrade information in primary stroke and CVD prevention.		comprehensive prevention strategies with high-risk people, implementation of an integrated approach to motivate health lifestyle change, apply technology in develop prevention methods and techniques, as well as education.