



**AGING AND NUTRITION: NUTRITION OF A CARDIOVASCULAR ELDERLY  
PATIENT.**

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<p><b>Abstract:</b></p> <p>The current literature study sought to add to the existing knowledge by assessing the prevalence of CVD among elderly Finnish people and the nutritional guidelines that can help prevent or manage the disease. Under the guidance of King's goal attainment theory, the author reviewed ten scholarly articles and established that most Finns suffer from four common forms of cardiovascular diseases: the coronary heart disease, hypertension, cardiac failure, and cerebrovascular disease. Consistent with existing evidence, the study found that some nutrients could be used in the management of these cardiovascular diseases. Consuming foods low in sodium, high in vitamin C, D and E were for instance found to be critical in the management of cardiovascular diseases. Plant proteins, magnesium, and coenzyme Q10 were also found to be reducing agents for cardiovascular diseases. Those who consumed fish and omega-3 supplements, as well as phytosterols, could also minimize their chances of becoming hypertensive. Based on the evidence pointing to the health benefits of nutrition, the study recommends that elderly Finns adhere to a healthy diet plan. It is recommended that they consume fresh foods, without adding table salt, sugar or high-calorie gravies that are cooked using methods that do not destroy the original nutrients. Moreover, the writer suggests further studies be undertaken to determine the diets that are rich in the identified nutrients.</p>	
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# 1 INTRODUCTION

Cardiovascular diseases (hereafter CVD) are a category of diseases which affect blood and heart vessels (WHO, 2011). Under CVD, there are heart and blood diseases such as coronary heart disease (CHD), hypertension, ischemic stroke, deep vein thrombosis and vascular dementia (WHO, 2017). These CVDs are said to be strongly associated with major health concerns across the world. Although Finland's CVD mortality cases have drastically reduced (Jyvakorpi, 2016). CVD still contribute to more than forty percent of all Finnish deaths (Statistics Finland, 2015). In 2003 45% of deaths in women and 40% in men were as a result of CVDs (Statistics Finland, 2015). The reduction in mortality rate has been highest among middle-aged people but there have been remarkable reductions in elder populations (Jyvakorpi, 2016). Instances of acute CVD events and stroke among the middle-aged populace have reduced but to a lesser degree when compared to mortality rates (Mathers, 2013). Incidences of stroke have also gone down among the elder generation though there is no evidence of how CHD events have changed in Finland.

Moreover, a protective link between nutrition and CVD has also been proposed (Jyvakorpi, 2016). Diets rich in plant protein, soluble fiber, and unsaturated fats, for example, has been seen to help manage CVD incidences. Some resistant starch molecules and soluble fiber are known to get fermented by bacteria in the large intestines to produce short-chain fatty acid which assists reduce the circulation of cholesterol (Salehi-Abargouei et al., 2013). Additionally, many other compounds within high fiber foods have protective influences. For instance, compounds such as amylase inhibitors, hormonally active lignans, saponins, and antioxidants found in fruits, vegetables, and grains have shown to reduce the risk of CVD (Jousilahti et al., 2016). Armed with this understanding, this research sought to examine the prevalence of CVD among elderly Finnish people and the nutritional guidelines that can help prevent or manage the disease. The study also proposes to create a nutritional guideline that can be followed by nurses working with the elderly Finns.

## **2 BACKGROUND**

The 21<sup>st</sup> century has been marked by growth in the number of the elder generation (those aged 65 and over) throughout the world. The growth has occurred not only in the emerging world but also in the developed world. Additionally, the elder population is also becoming older: the number of people aged over 80 years is growing rapidly in most countries. Current estimations indicate that the size of the world's elderly population will increase considerably within the next century, with major impacts being realized in healthcare systems, economies and social structures throughout the world. The percentage of older populations will increase by over 20% in Europe and North America and by 10% in the Caribbean, Latin America, and Asia. This growth will be much higher in developing countries with the over-65 population set to double in many of those developing countries. Current projections indicate that by 2050 there will be 1.6 billion people aged above 65 (Wan et al., 2016). In Finland's case, for instance, the number of those aged 65 years and above will increase from the current 19.9 to 26% by 2030 (Statistics Finland, 2015). The number of very elderly people, above 80 years, will also increase early in the next century (United Nations, 2018). The number of those aged over 80 years is expected to triple by the year 2050, from the current figure of 137 million to 425 million (United Nations, 2018).

### **2.1 Cardiovascular disease in elderly people**

The prevalence and incidences of CVDs rise as one ages and therefore the prevalence of disability increases (Sergi et al., 2015). Roughly 50 million deaths occur annually throughout the world, 80% of these occurring in developing nations (Sergi et al., 2015). It has been established that most of these deaths are attributable to CVD. Globally there are more deaths from CHD (5.2 million) than there are from stroke (4.6 million), although the comparative importance of CHD and stroke differs considerably between nations. For instance, twice as many deaths occur due to stroke in developing nations as in developed nations, with one million alone occurring in China (Ritchie & Roser, 2018).

In most developed nations CVD account for roughly ten percent of direct health care costs and more than half of these diseases occur in people aged 65 and older (Baird, 2016). These expenses represent between 0.5 and 1 % of the nation's gross domestic product. There are a set of other costs related to CVD, which is a bit difficult to evaluate especially because old people tend to suffer multiple diseases, and partly because some of the costs are hidden due to the fact that they are borne by family members (de Meijer et al., 2013). It can, therefore, be predicted that the economic burden on the healthcare system occasioned by CVDs will increase with the rising elderly population. The burden on society is also contingent upon the prevalence and incidence of CVDs in every age group, the age structure of the population and the extent of disability resulting from CVDs. However, aging does not necessarily directly lead to an increase in healthcare expenditure (Westerhout, 2014). Healthier elderly people are more likely to experience fewer health care needs. The aging process itself is influenced by modifiable factors (Steves et al, 2012). It is predicted that environment-related factors contribute to around 75% of the lifestyle influencer elements and among the most critical are quality of physical activity and food. This implies that good nutrition throughout one's lifespan is critical to longevity and healthy aging (Mathers, 2013).

## **2.2 Aging and Nutrition**

Successful aging has been described as a multidimensional idea which is characterized by a lack of disability and disease (Pallauf et al., 2013). It is also characterized by higher levels of cognitive and physical functions and sustained participation in productive social work (Pallauf et al., 2013). An individual's aging process is affected by both environment and genetic factors. (Mangino, 2014), estimated that environmental factors contribute to 75% of the aging process. Proper and balanced diet throughout the life of an individual can, however, support healthier aging (Mathers, 2013). Nutrition has a multidimensional influence on a person's mood, survival, cognition and functional ability (Kiefte-de et al., 2014). Proper nutrition also helps preserve the normal functioning of the immune system (Kiefte-de et al., 2014). Vital micro- and macronutrients and trace elements are desirable in the maintenance of the health of elderly



people and are said to play a significant part in the proper functioning of the immune system (Woods et al., 2013).

Good nutrition has been seen to play a critical part in the management of morbidity and mortality resulting from non-communicable diseases (WHO, 2011). The increasing awareness of protective nutrition has had to underpin many interventions which aim to reduce diet-associated ailments such as CHD and CVD as well the extensive financial problem placed not only on family structures but also on the country's healthcare system. Often elders, especially those aged 85 and above, are at a greater risk of suffering from chronic CVD disorders. Not only does their genetic makeup weaken with the aging process but a set of behaviors and experiences throughout their lifespan dictate cardiovascular health risk (WHO, 2011). For instance, little or no physical exercise in earlier years may adversely impact on their health status, whereas depression and isolation later in life reduce their appetite and increase the probability of nutrient shortage. Moreover, present health disorders coupled with malnutrition work in exacerbating CVD-related disorders. An amplified risk of mortality and morbidity is linked to malnutrition in older people. The critical role of good nutrition in the control of disability and death among the elderly is fully accepted and recognized in geriatric care. For instance, the American heart association recognizes that the Mediterranean type diet has a significant influence on the prognosis of CVD and therefore recommends that elder people follow a similar diet for disease-free aging (Sofi et al., 2014). Tuft University researchers have come up with an improved MyPyramid for elderly people that resembles the US Department of Agriculture Food Pyramid which includes icons that represent the six categories of food and emphasize the need for consumption of fluids (Papanikolaou et al., 2014). This implies that adopting and adhering a healthy lifestyle which includes a balanced diet can defer mortality and morbidity from CVD, enhance healthy aging and control the number of healthcare resources required by the elderly generation. With this understanding, this paper seeks to identify the common cardiovascular diseases among Finnish elderly and the possible nutritional requirements that can help prevent and control them.

### **3 THEORETICAL FRAMEWORK**

A theoretical framework defines an assembly of organized concepts that guide a research process (Denzin, 2017). It provides the rationale for undertaking a research to investigate a specific research problem. Its development helps identify the plan for investigation as well as the interpretation of research findings (Williams, 2017). It entails a well-supported rationale and is organized in a way that assists the reader to understand and assess the researcher's perspective. The current dissertation is based on the goal attainment theory that presumes that nurses and their patients share information, set mutual goals, and they act to accomplish those goals. A research by (Wisniewski, 2013) shows that the relationship between nursing professional and their clients can have an impact on how objectives are set as well as how they can be achieved. It also describes nursing as a process in which nurses and patients act, react, interact and share information concerning their opinions of a nursing situation. The study uses King's theory of goal attainment as the main theoretical framework for the study.

#### **3.1 Relevance to king's goal attainment theory to the current thesis**

King's theory is employed as the main theoretical model for the current dissertation. Its use is informed by the fact that the theory offers an opportunity for the understanding of the kind of the relationship that must exist between a nursing professional and a patient in order to achieve the needs of the patient in a respectable way (Alligood, 2017). The use of the framework was intended to help the researcher organize the research themes in a manner that would appropriately evaluate client care and improve nursing interventions. In addition, King's theory was used as the theoretical basis on which decision regarding nursing interventions that take care of patient goals and needs would be made in order to achieve sustainable living. The main concepts, assumptions, and propositions of the theory are discussed as under:

### 3.2 Propositions

King's theory has its base on a number of predictive propositions. These include but not limited to:

- i) A transaction will occur in the presence of accurate perceptual interaction between patient-nurse interactions.
- ii) Goals are attained whenever there are effective nursing and client transaction.
- iii) Satisfaction occurs when set goals are accomplished
- iv) Effective nursing takes place when goals are met
- v) Transactions between nurse and clients result in enhanced growth and development.
- vi) Stress is a result of conflicts between nurse and client roles
- vii) Transactions will also occur if there is congruence in role performance and role expectations as perceived by both the patient and the nurse
- viii) Mutual goal setting can only occur whenever nurses use skills sets such as perceiving, judging, thinking, and relation to match their clients' behavior (Alligood, 2017).

### 3.3 Assumptions

King's individual philosophy regarding life and human beings affected her assumptions associated with individuals, nursing, health, environment and nurse-client interactions (Williams, 2017). The goal attainment theory has its base on the general notion that nurses concentrate on human beings who interact with their immediate environment, resulting to a state of health for the people, which is the capability of functioning in social roles. The other assumptions are:

- Nursing majorly focusses on patients i.e. human beings.

- Nursing aims at ensuring and maintaining health for groups and individuals
- Human beings themselves are open systems that interact with their environment
- Nurses and patients share information, set mutual goals and work to achieve them
- Patients perceive the environment as being a complete individual
- Circumstances which occur during one's lifetime are represented by the transactions which occur whenever each and every individual undertakes an active part in changing the results of their experiences (Williams, 2017).

### **3.4 Major Concepts and Sub-concepts**

#### *Nursing*

Nursing is seen to be a process through which nurses and patients act, react, and interact together (Alligood, 2017). The patient and nurse share particular concerns, issues, and goals and explore the means that help accomplish the goals.

#### *Health*

King's theory describes health as a dynamic living experience of human beings. It also indicates the constant adjustments made to stressing elements in both the inner and outer atmosphere through the optimum use of the resources available to human beings. According to (Alligood, 2017) health should be taken not as a continuum but as a holistic condition.

#### *Individual*

Individual is perceived to be a human being who is not only sentimental but also rational (Williams, 2017). He or she communicates inner beliefs, customs, actions, and thoughts through language. King was of the opinion that people are able to feel and choose between alternative courses of action. They can think, set objectives, make decisions, and accomplish those objectives (Wisniewski, 2013). King also opined that all humans have the same basic needs

which have to be satisfied. Such basic needs include the need for information, the need to avert disease, and proper healthcare.

### *Environment*

Environment is described as the background in which human beings interact. It is both internal to and external to human beings (Wisniewski, 2013).

### *Action*

Actions are perceived to be sets of behaviors that may be either physical or mental. The sequence is initially mental in order to identify the existing conditions; then becomes physical in order to start activities associated with those existing conditions; and lastly becomes mental in order to exert power over the given situation, joint with physical actions aiming to attain goals (Wisniewski, 2013).

### *Reaction*

Reactions are not precisely defined but are thought to be included in the set of behaviors defined in action.

## **3.5 Interacting systems**

King proposed three interacting systems her theory: social, interpersonal and personal system. Each of the three has different concepts that are key to nursing (Alligood, 2017).

### **3.5.1 Personal systems**

Each human being is a personal system. Both the nurse and patient are examples of personal systems. Personal systems are said to be the individual beliefs about oneself, time, and image. Such beliefs influence the manner in which the individual responds to objects and actions in his or her life (Gonzalo, 2011). The concept of personal systems is based on how patients look, feel, and think about themselves. It entails elements such as perception, self, time, body image,

learning, and growth. According to the king theory, perception is the awareness of one's experiences and is gained when one processes and organizes memories in a bid to influence behavior and his representation of reality (Alligood, 2017). The concept of “self” has its basis on the thoughts and feelings that patients have towards their own existence. It includes a patient’s commitments, experiences, values, ideas, beliefs, attitudes, and the inner world all of which differentiate them from other patients. In simple term, the idea of “self” describes who patients are and what they consider themselves to be (Alligood, 2017). Development or growth is said to be a lifelong process of emotional, cognitive, physical, and behavioral maturity to oneself, and is based on experiences which are meaningful (Gonzalo, 2011). The concept of body image describes how patients view themselves, their bodies, and the reaction others have on their body image. Space is said to be the idea of the presence of a physical area which expands in all directions while time is the interval between two occurrences experienced by a client. Learning is the final concept which is supposed to sum up all the information and insights that is acquired from one’s personal system (Wisniewski, 2013)

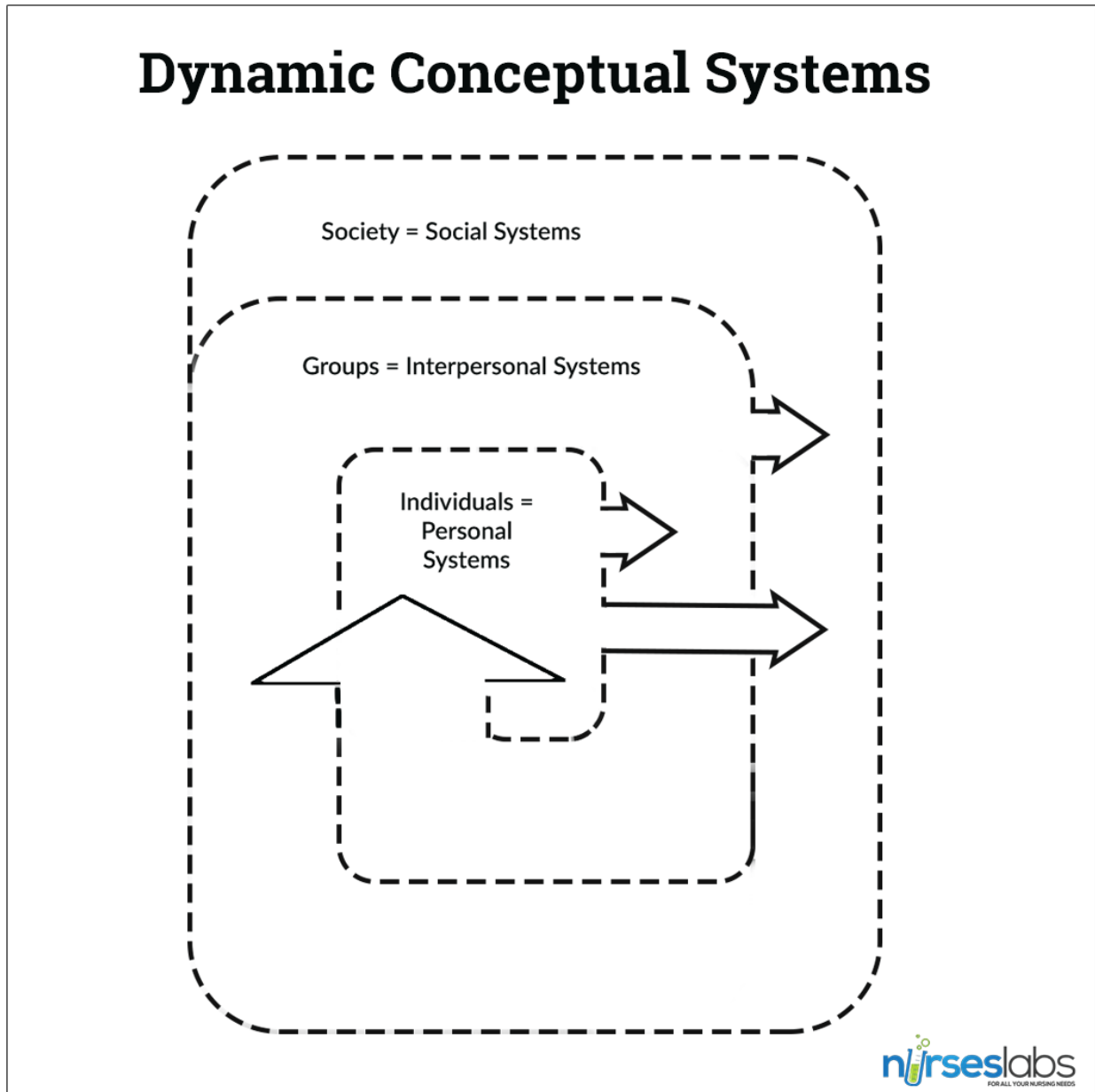
### **3.5.2 Interpersonal systems**

These are constituted by individuals interacting. The interaction of two people forms a dyad, that of three people form a triad while that of four or more people form a group (Alligood, 2017). Interactions get more complex whenever a greater number of people enter the interaction process. The interaction between nursing practitioners and a client should aim and work to achieve the established goals (Varghese, 2012). It must also comprise the ideas of an interpersonal system including intervention, communication, role, stress, and transaction. According to Kings Theory, interactions describe the observations of both spoken and non-spoken behaviors in more than two human beings (Gonzalo, 2011). The researcher sees communication as an idea which according to the theory is perceived as the process in which information is conveyed between two people directly through a one-on-one communication or indirectly via written word, or television (Williams, 2017). Transactions are said to describe the interactions that occur between human beings and their immediate environment when they share information regarding the objectives they are aiming to achieve. The concept of role describes

the people's rights, attitudes, and duties in a particular social status. Stress is the concluding concept which includes transactions of energy between people and their environment in maintaining regulation and balance of mental, physical, and emotional tension (Varghese, 2012)

### **3.5.3 Social systems**

These are said to be the interactions which take place between a nursing professional and his or her patients who are supposed to share the same objectives, value, and interests (Williams, 2017). Social system is the basic concept of development in interactions and relationships. King states that social systems are derived from a number of other concepts including authority, organization, decision making, status, and power (Alligood, 2017). The idea of organization is said to describe a crowd of people who have well-defined roles aiming to achieve both their personal and collective goals by using all the resources at their disposal. The concept of authority is described by (Wisniewski, 2013) as the association of people/beings whose views, values, and upbringings are marked by reciprocal transactional processes that accept, authenticate, and define the individuals' authority. Power is an idea of an individual or a group manipulating another person in a given condition. It has the ability to attain goals by making use of the assets and forces within the environment. Status defines the position of a person in the society. It includes the person's responsibilities, lifestyles, and rights within his or her organization. Decision making is the last concept and describes the act in which a group or individuals come to an understanding with a choice of achieving a shared goal (Gonzalo, 2011).



*Figure 1: Dynamic conceptual systems (Wayne, 2014).*

The above figure shows the conceptual system that provides a singular approach to the study of systems in its entirety as opposed to studying isolated parts of the system and is meant to explain ordered wholes within which nursing professionals should function.



## **4 AIMS AND OBJECTIVES**

Previous studies have examined CVD from a global perspective. The current study sought to examine the prevalence of CVD among elderly Finnish people and the nutritional guidelines that can help prevent or manage the disease. The study is also informed by the need to examine the applicability of past studies in the finish context. By conducting a scoping literature review, the author hoped to determine the current evidence on the common CVDs and the nutritional guidelines that can help manage or prevent such diseases, for sustainable living.

### **4.1 Research Questions**

In order to accomplish the research objectives, the study had to address the below questions.

- a) What are the most prevalent cardiovascular diseases among elderly finish people?
- b) What are the nutrition guidelines that can help prevent or manage CVDs among elderly finish people?

## **5 METHODOLOGY**

Methodology is said to describe the systematic approaches used in undertaking a research study (Denzin, 2017). It is supposed to help researchers collect and analyze data in an effective manner. A research methodology can also be taken to describe the manner in which a researcher proposes to carry out their studies. It establishes the design, approach, population, and sample from which data is collected and analyzed. There are different research methods which can be used in undertaking a research study (Denzin, 2017). Researchers, however, have to choose the appropriate methodology depending on his or her research questions. The current study is based on secondary research data. It evaluates secondary sources with a view to identifying the health consequences of cardiovascular diseases among the elderly as well as the interventions that nursing professionals can use in managing those health consequences. The study uses the most relevant data which (Brannen, 2017) says should result in a successful literature review. Emerging concepts and themes from the secondary data sources are analyzed using inductive content analysis.

### **5.1 Data Collection**

Data collection is the process through which authors gather research data. Data can be gathered from either secondary sources or from primary sources. Primary data is acquired from original sources. It is the first-hand information collected from research respondents using methods such as questionnaires, interviews, and focus groups. Secondary data is collected from already compiled evidence found in books, magazines, articles, or on websites. The current study collected data from secondary sources which were retrieved from a number of databases. Relevant articles were selected and reviewed against the research objectives. They were to provide basic information regarding the research topic and help in answering the research questions. Such articles were searched and retrieved using keywords such as "Elderly's Nutrition", "Cardiovascular Disease Management", and "nutrition intervention in CVD". "Influence" "effects", "relationship", and "impacts" were the words used to describe the relationship between nutrition and CVD among the elderly.

The main area of concentration was the use of nutrition in preventing CVD and therefore words such as “nutrition’s role in CVD”, nutritional guidelines for CVD and "diets and CVD" were also useful in the articles search. Synonyms to the keywords were taken into account during the literature search as most authors use a variety of words when describing phenomena. The keywords were used in conjunction with Boolean operators such as AND, OR, or NOT to help exclude irrelevant hits (Hart, 2018). This reduced time and effort needed to sift through inappropriate hits that were to be eliminated. Different databases use the three Boolean modifiers differently. Some require that the operators be in caps while others require that the modifiers be punctuated in a certain manner. Medline and EBSCO, for instance, are planned in a manner that uses the modifiers “AND” during the literature search. In some circumstances, the two databases require the creation of additional rows of AND in order to help enlarge the search criteria. Contrastingly Science Direct and PubMed are designed in a manner that requires the use of the Boolean operators in a sentence form. This is different from EBSCO and Medline which require that the modifiers come between the keywords in order to assist provide target hits.

### **Including and Excluding Criteria**

The researcher had to formulate the research questions before starting the research process. This was to intended to assist simplify the data collection process. An including and exclusion criteria was also developed to assist ensure that the selected articles provided relevant and trustworthy information. The author did not intend to use expensive materials and had to access those articles which were freely accessible from the five databases. This helped in not only reducing the overly cost of the study but also in making sure that the research was completed using readily available research sources. In addition, the study made use of current secondary literature sources and had to limit the search process to those articles published between 2013 and 2018. Such criteria helped acquire current information on the subject under study.

The writer also come up with an exclusion criterion to ensure that only relevant articles were accessed and examined. The study had to omit all articles bearing irrelevant and nonscientific material. This was to help gather information that is reliable and has been scientifically proven to work. The study had to also exclude articles published outside of the period between 2013 and

2018. This is because such articles contained noncurrent information which could not be trusted to help in the current study (Hart, 2018). Finally, the study had to exclude articles that contained subjective information in order to ensure that the study was credible and generalizable. A summary of the excluding and including criteria is shown below.

*Table 1: Inclusion and exclusion Criteria*

<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>
Article issued between 2013 and 2018	Article does not focus on CVDs
The article has relevant information that addresses cardiovascular disease among elderly Finns and the nutritional guidelines for such people.	The study is irrelevant and does not address cardiovascular disease among elderly Finns and the nutritional guidelines thereof.
Scholarly journal article or professional report	Non-peer reviewed journal article
The results of the study are credible, valid, and trustworthy	The results are devoid of credibility and validity.
Credible and confirmable data analysis	Data analysis methods are either omitted or are not credible
Results of the study are transferable	Un-transferable result
Article is freely available and accessible in full text	Article has to be paid for before it can be accessed in full text

The exclusion and inclusion criteria were applied as shown below in Appendix 1. The researcher screened a total of 2,453 titles and articles and titles. Most of these articles (710) were duplicates and had to be discarded. Another batch of 594 articles had to be eliminated since they did not

satisfy the including criteria. The researcher identified 466 articles through the application of the Boolean operators. However, only 59 of the 466 were available freely and in full text. The study finally came up with ten articles which satisfied the publication criteria between 2013 and 2018. Appendix 2 presents a list of the main sources of data which were found relevant for use in the current study.

## **5.2 Data Analysis**

Data analysis is described as the process in which the researcher extracts information from data. The process requires a researcher to establish the datasets, process data, apply models, identify key findings, and create key reports. The main purpose of data analysis is to find actionable insights that can be used as the basis of decision making. Data analysis can involve the use of big data analytics, business analytics, statistical tools, descriptive statistics, or data mining. The current study, however, uses quantitative content analysis to analyze the research data. A study by (Neuendorf, 2016) argues that quantitative content analysis is a useful method when it comes to data evaluation. It is a systematic process in which researchers code and recognize themes or patterns in their dataset. The method was used to help understand the phenomena under study in a systematic way through the examination of the recurring themes and contents (Neuendorf, 2016).

In their study (Riff et al., 2014) describe content analysis as an analytical technique in which authors using it develop themes and identify their implications. It is also objective and therefore can allow researchers using it can draw replicable and valid conclusions (Riff et al., 2014). The data analysis technique is also flexible and sensitive to the research approach and design used. A number of researchers have however been critical of the technique by arguing that it is too difficult to be used by an ordinary researcher (Hart, 2018). Content analysis is also said to be labor intensive as researchers have to peruse through a large volume of data to unmask recurrent themes and patterns. The use of the technique was however informed by the fact that the method is cost-effect, content sensitive, and useful in the evaluation of secondary data (Hart, 2018).

The techniques are also said to be effective in the appraisal of both quantitative and qualitative secondary data through inductive and deductive means. Inductive approaches are useful in studies which are characterized by the absence of information on the particular subject under examination. The deductive method is contrastingly useful in studies where there is plenty of research data on the subject matter under review (Hart, 2018). Secondary data sources relating to nutritional guidelines for CVD in elderly Finns were inadequate. This is particularly because most finish researchers have studied phenomenon of CVD from a global perspective (Jyvakorpi, 2016). The researcher thus had to employ the inductive research approach. The approach assisted assess questions which could not have been answered through quantitate approaches.

### **Inductive and Deductive Approaches**

Qualitative content analysis makes use of three techniques including conventional content analysis, direct content analysis, and summative content analysis (Brannen, 2017). The latter dictates that researchers start by counting the words in a data set (Brannen, 2017). This is then followed by an assessment which takes into account the meanings of the inherent themes. The technique appears to be quantitative in the first few steps but its aim is to use and explore words inductively. The direct content approach starts by establishing a theory which allows researchers to analyze emerging themes and patterns during the data analysis process (Brannen, 2017). It assists researchers to validate and extend their theoretical frameworks in an orderly way. A researcher can also code directly or indirectly from facts using conventional content analysis. The technique allows a researcher to assign texts to different themes simultaneously (Brannen, 2017).

The current study had to consider the research questions throughout the content analysis process. A thorough understanding was needed to help the researcher focus on the most specific and relevant elements of the contents of the article. Organization of relevant articles was done using the open coding process whereby numbers from one to ten were assigned to represent the used articles. The writer had to independently read all the ten articles and note down the most important information. Later the researcher reassessed the gathered information with a view to classifying each item in a manner that helped provide a suitable explanation of the themes in

each article (Brannen, 2017). Finally, the identified themes evaluated in great detail to determine their usefulness, fit, and if they had adequate information.

### **Abstraction and Interpretation**

After reading through and evaluating the ten articles prevention and management of CVD among elderly people emerged as the main theme. Any nutrition or nursing interventions aimed at improving the elderly's health statuses was seen to be centered on the main theme. Generally, the researcher looked at the main theme from a nurses' perspective.

## **5.3 Ethical considerations**

The author of the current dissertation had to consider all the ethical issues that could adversely affect the research. According to (Boutin-Foster et al., 2013) researchers should take into consideration the interpersonal factors, policy factors, and organizational factors before starting off their research process. A researcher should not give personal details of other writers such as place of residence which may be used against them. He or she should only be guided by the different referencing styles and principles when writing a paper but not his or her ideas (Boutin-Foster et al., 2013). For the current research to be ethical, the researcher had to maintain the instructions and standards of the university. The research had to first discuss the research topic with the current supervisor in order to help fine-tune and offer directions on how to approach the subject.

The research was also guided by the understanding that "copy-pasting" one's ideas have far-reaching research implications. A researcher can, for instance, have his or her research paper canceled or get fined. The researcher thus had to reduce the instances that would result in the study being labeled *plagiarized*. Secondary sources were read and interpreted according to the writer's own words. In such respect, the researcher had to make sure that the meanings of the original author were retained. In addition, direct quotes were properly cited as required by the university.

All emerging categories and themes in the ten articles were not be falsified but instead were presented honestly. Proper and ethical methods of collecting data were employed in order to increase the validity and reliability of research findings. The researcher also avoided all forms of bias throughout the research process. All articles were examined independently so as to reduce instances where one source of information influences others (Hart, 2018). Finally, the research had to eliminate research bias during the data analysis and interpretation stage. This was to help present research findings in an objective and unbiased manner.



## **6 RESULTS**

This part provides the analysis and summary of the research results. Findings are based on an evaluation of the themes found in ten peer-reviewed articles. The overriding aim of the study was to examine the prevalence of CVD among elderly Finnish people and the nutritional guidelines that can help prevent or manage the disease. Data was collected through a scoping literature review. The researcher had to include both peer reviewed articles and dissertations due to lack of data on Finland's. The researcher had to ensure that all the data sources were reliable and credible.

### **6.1 Prevalence of CVDs among Elderly Finns**

The prevalence of cardiovascular disease was seen to have remained the same or reduced over the last five years depending on the criteria used for diagnosis [1, 2, 3,4,5,6,7,8,9, and 10]. However, the researcher was interested in getting an overview of the common cardio diseases among the elderly Finn, some of which are discussed under:

#### **6.1.1 Coronary Heart Disease (CHD)**

CHD is a heart condition in which a waxy-like substance referred to as “plaque” builds up inside someone's coronary arteries [1 and 2]. The disease was found to count among the most common killer diseases among elderly people in Finland [1, 5, 9, and 10]. All the studies observed that the self-reported CHD was a concern for finish people aged above 65 years [1, 2, 3,4,5,6,7,8,9, and 10]. The disease was however seen to have remained fairly stable during the past two decades and was affecting elderly health and life [1, 9, and 10]. Clinically diagnosed CHD was also prevalent among Finns who have reached 65 years but was seen to be changing to a milder condition [1].

### **6.1.2 Hypertension**

Hypertension is a long-term heart condition in which blood pressure in blood vessels gets persistently elevated. It can strain the heart, damage arteries and increase the risk of other heart conditions such as stroke, heart attack or even death [5 and 9]. Analysis of the ten articles showed that the self-reported disease was prevalently increasing in men aged 65 and 74 and decreasing among women of the same age group [1, 5, 9, and 10]. The main reasons behind the reduction of hypertension cases were found to be enhanced treatment and lowering of BP levels utilized as a criterion for treatment [1]. Older people who are too obese were found to be at a higher risk of contracting the condition when compared to those who had “normal” body mass. Most articles showed that hypertension is a result of increased sympathetic tone, increased angiotensin system action, and sodium retention [1, 4,6,7,9, and 10].

### **6.1.3 Cardiac Failure**

Congestive heart failure was seen to occur when the heart muscles do not pump blood sufficiently due to high blood pressure or narrowed arteries in the heart [1, 5, 9, and 10]. The study established that around one percent of Finnish elderly population experience heart failure [1, 5, and 10]. The condition occurs equally often in men and women, though the survival rate for men is a bit poorer. Improvements in survival for people with high blood pressure and angina was seen to increase the prevalence of chronic heart disease and ultimately heart failure [1, 2, 5, and 10]. Analysis showed that there is uncertainty concerning the etiologies for cardiac failure which has shifted in the last few years from predominantly hypertension to coronary heart disease [1, 3, 8 and 9].

### **6.1.4 Cerebrovascular Disease**

These are conditions that result from problems that affect blood flow to the brain [1 and 5]. A number of cerebrovascular diseases were seen to affect elderly Finns but the most common conditions were stroke and vascular dementia [1, 5, and 10]. Vascular dementia was seen as the second most common cause of dementia after Alzheimer disease [1]. Many of the elderly Finns

above 65 years suffer from dementia, a third of whose origin was vascular dementia. A reduction in the supply of blood to the brain was also seen to result in stroke for those who had been hypertensive for longer periods [5].

## **6.2 Nutritional Interventions**

Nutrition has been identified as being critical in the management of cardiovascular diseases [1, 2, 3,4,5,6,7,8,9, and 10]. This awareness of preventive nutrition has underpinned most interventions that aim at reducing non-communicable diseases such as CVD, and the large financial problem placed on family structures and health care.

### **6.2.1 Dietary Patterns**

#### Low-fat diet

Consuming low-fat diets were generally seen to help prevent CVD [1, 2, 3, 4,5,6,7, and 10]. A daily intake of total fats ranging between 25% and 35% of all calories was recommended [1, 3, 4,5,6,7, and 10]. Most of these fats should be unsaturated for the prevention to be effective. This recommendation is achieved when one chooses a diet that contains low meat fats and emphasizing on vegetables, fruits, low-fat dairy products, as well as lowering foods that contain trans-fat (TFA) [1,5,6,7, and 10].

#### Low-carbohydrate diets

A diet that is low in carbohydrates is the one that contains between 30-130 grams of carbohydrates or up to 45% of all calories. Evidence has indicated that low carbohydrate intake is linked with a reduction in triglycerides (TG) and rise in HDL-cholesterol (HDL-C) [1, 2, 3, 4, and 7]. Most of the articles indicate that low carbohydrate diets significantly help reduce instances of plasma TG, increase in HDL-C, diastolic blood pressure, systolic blood pressure, BMI, and body weight [1,2,3,4,5,6,7, and 10]. Low carbohydrate diet was seen to favorably affect one's body weight and lower major CVD risk factors [1, 4, 5, and 6].

### Mediterranean diet

This kind of diet entails high consumption of fats (between 40 to 50 percent of total daily recommended calories), of which SFA constitutes  $\leq 8\%$  and MUFA ranges between 15% and 25%. It has a higher concentration of omega-3 fatty acids from plant sources and fish and low omega-6: the omega-3 ratio of between 2:1 and 1:1. It has its base on local olive oil, nuts, legumes, whole grains and bread, fruits, and fresh vegetables [3]. Taking dairy products (low in fat) as well as chicken, fish, and eggs in moderation are also allowed, while consumption of red meat is completely disallowed [1, 3, 5, 6, and 7]. Observance of this type of diet is associated with low risk of CVD as shown in the analysis of most of the articles [1, 2, 3, 4,5,6,7, and 10].

### Dietary approach to stop hypertension (DASH) diet

DASH diet has been seen to reduce the risk of hypertension and consequently incidences of CVD [3, 5, and 7]. The DASH diet is made up of fruits and vegetables, whole grains, low-fat dairy products, white meats, and nuts. It is also low in fat, sodas, sugars, and meat [3 and 5]. Table 3 below summarizes the DASH diet comprising of the essential recommended elements.

*Table 2: The composition of a dash diet (Zou et al., 2017).*

<b>Nutrient</b>	<b>Daily quantity</b>
Total fat	27% of total calories
SFA	6% of total calories
Carbohydrates	55% of total calories
Protein	18% of total calories
Cholesterol	150 mg
Fiber	31 g
Potassium	4700 mg
Magnesium	500 mg
Calcium	1240 mg

The dash diet has been seen to assist reduce diastolic and systolic blood pressure by about 5.5 and 11.4 mmHg respectively in hypertensive patients [2 and 5]. Reducing sodium in the diet was further noted to reduce blood pressure and improve automatic vascular functioning [1, 2, 3, 4,5,6,7, and 10].

## 6.2.2 Individual foods

### Whole Grains and Fiber

Whole grains are known to represent the unprocessed grains that have with them the bran, the endosperm, and the germ in the same proportion. Common whole grains include wild rice, sorghum, millet, barley, corn whole rice, and whole wheat [1, 4, 5, 7, and 10]. Dietary fiber, on the other hand, is made up of substances resistance to hydrolytic digestion by the body's alimentary enzymes. They are categorized into being either soluble fiber such as lignin and cellulose found in whole grains, some fruits and vegetables and soluble fiber found in mucilage, guar gum, pectin, and fruits. Studies have revealed that eating foods rich in either fiber reduce CHD or its risk factors [1, 2, 3, 4,5,6,7, and 10]. Whole grains were seen to be lower cholesterol levels by significant amounts [3 and 4]. This implies that consuming whole grains such as whole oats and barley can significantly lower CVD risk factors among elderly people.

### Fruits and Vegetables

There have been linkages between fruits and vegetables with reduced CVD risk. Elderly Finns who consumer lots of fruits and vegetables were found to have a 7% reduction in CVD risk levels [1, 2, 3, and 5]. Consumption of vegetables was even seen to reduce CVD mortality levels.

### Nuts

Nuts are very rich food containing unsaturated fatty acids and other bioactive compounds. They include almonds, pecans, macadamias, walnuts, and hazelnuts. Research-based evidence indicates a negative correlation between consumption of nuts and CVD risk [1, 2, and 5]. High intake of nuts was for instance found to reduce CVD risk by 35% [1, 7, and 10]. Daily intake of 67 grams of nuts lowered LDL-C levels by an average of 10 mg/Dl [3, 4 and 5]. Different types of nuts were seen to have a similar effect of blood lipids concentration [5]

### Soy products

Soybeans are good sources of B vitamins, Zinc, calcium, iron, and fiber. Studies have consistently shown that soy products such as soymilk and soy meat may help reduce CVD risk

[1, 4, 5, and 10]. They also help lower cholesterol along with blood pressure and LDL because of their cardioprotective effects [3 and 4]. Combined with other foods such as oats, nuts, and sterol margarine, soy foods were found to be very effective as they lowered LDL cholesterol by 30% [4].

### **6.2.3 Nutritional Guidelines**

#### **Salt and sodium**

A diet low in sodium was seen to fit all dietary strategies [1, 2, 3, 4,5,6,7, and 10]. Table salt, soy, soups, and gravies are good sources of sodium. Increase in the intake of dietary salt was found to lead to an increase in blood pressure [1, 2, and 5]. However, lowering of sodium intake was not significantly found to have any effect on the risk of CVD [7].

#### **Antioxidant Vitamins**

The role of antioxidant vitamins in CVD has also be studied [1, 7, and 10]. Vitamin C and E were found to reduce the risk of CHD by around 34 percent [7 and 10]. Combination of these two vitamins with zinc, beta-carotene, and selenium helped reduce the risk of ischemic CVD by eleven percent [10]. Daily intake of vitamin E (60 IU/day) minimized the risk of CHD by approximately 36% [7]. Elder men who use vitamin E for two years (100 UI/day) were seen to have a higher reduction in the risk of CVD [1 and 7]. Vitamin C intake (700 mg/day) reduced the probability of CVD by 25% when compared to those who have not taken the vitamin [10]. Vitamin B was also seen to play an important role in CVD. Folic acid, for instance, helped improve endothelial function while vitamin B6 prevents low-density lipoprotein-induced impairment of endothelial cell [1 and 10].

#### **Plant proteins**

Proteins from plant sources such as soy protein, nuts, and legumes were found to be good in reducing cholesterol synthesis and premature atherosclerosis [1 and 10]. Nuts contain the healthy mono and polyunsaturated fats that are beneficial in CVD prevention among the elderly [7 and

10]. Plant sterols were also good as it helps lower LDL-C and the absorption of cholesterol [7]. Its sources include whole foods such as whole grains [7].

### Vitamin D

A diet rich in vitamin D was seen to help with many diseases including the CVD [3 and 7]. A diet that has a high concentration of oily fish averts the deficiency of vitamin D [3]. Studies have noted that vitamin D supplements reduce the incidents of CVD, however not statistically significant [3, 5 and 7].

### Coenzyme Q10

Coenzyme Q10 was seen to work as an antioxidant, helping to fight free radicals and preventing peroxidation of lipids [4]. Adequate intake of CoQ10 rich foods was seen to be essential in improving the endothelial function [3]. However, sufficient evidence does not exist to support the claim that CoQ10 reduces the risk of CVD [4].

### Magnesium

Mg is contained in green leafy vegetables, nuts, soybeans, and whole grains. The recommended daily intake for men and women is 420mg/day and 320 mg/day respectively [1 and 4]. Review of articles shows that mg is inversely associated with mortality and morbidity for stroke and heart disease [1, 2, and 10].

### Omega-3 and fish

Some articles revealed that consuming fish reduces CVD risk [1, 2, 3, and 5]. Consuming 40-60grams of fish daily was enough to reduce CHD mortality in high-risk patients [5]. Omega-3 was seen to reduce hypertension, improve endothelial function and enhance plaque stabilization [1, 2 and 3].

### Phytosterols

Some studies have shown that phytosterols reduce LDL-C concentration by around ten percent [1, 5, 6, and 7]. An optimal dose of between 1.5 to 2.5 grams per day was seen to be appropriate and helpful for those at high risk of CVD [1, 2, 3, 7, and 10].



## 7 DISCUSSION

The study sought to assess the prevalence of CVD among elderly Finnish people and the nutritional guidelines that can help prevent or manage the disease. Analysis of ten articles helped answer the two questions and formulate a nutritional guideline for nurses working with the elderly to follow.

### 7.1 Prevalence of CVDs among Elderly Finish People

The current dissertation established that CVDs have been more prevalent among elderly Finns, especially those aged above 65 years. Majority of Finns suffer and die from coronary heart disease, hypertension, cardiac failure and cerebrovascular disease which manifests in form of stroke and vascular dementia (Jyvakorpi, 2016). These diseases have been counted among the top ten killers diseases over the last decade and therefore there is a need to reduce the risk of their occurrence (Kieft-de et al., 2014). Below, the researcher discusses some of the most prevalent cardiovascular diseases.

#### *Coronary Heart Disease (CHD)*

CHD is common among Finns aged over 65 years. Those who had nutrient-deficiencies, engaged in smoking or had less physical activity at a higher risk of the CVD disease (Vartiainen, 2018). However, the study established that the condition, though remained fairly stable during the past two decades, could be treated by use of nutrition (Nevárez, 2016).

#### *Hypertension*

The analysis also showed that self-reported hypertension was prevalently increasing in men aged 65 and 74 and decreasing among women of the same age group (Vartiainen, 2018). Older people who are too obese were found to be at a higher risk of contracting the condition when compared to those who had “normal” BMI. Hypertension is was particularly seen to occur due to increased sympathetic tone, high angiotensin action, and increased sodium retention.

### *Cardiac Failure*

Congestive heart failure was seen to occur when the heart muscles do not pump blood sufficiently due to high blood pressure or narrowed arteries in the heart. It was established that roughly one percent of Finnish elderly population experience heart failure at some point in their lives. The conditions of etiologies were uncertain though the condition has over the years shifted from predominantly hypertension to coronary heart disease (Jousilahti et al., 2016).

### *Cerebrovascular disease*

Of the four CVD diseases, cerebrovascular disease was the least prevalent among elderly Finns. The disease is caused by problems that hinder blood supply to the brain. The most common cerebrovascular diseases among elderly Finns were vascular dementia and ischemic stroke. Old people who were hypertensive for long periods were likely to suffer from stroke and vascular dementia (Mangino, 2014).

## **7.2 Nutritional interventions for CVD**

The study also noted that some nutrients were critical in preventing and or reversing CVD diseases. Those who could stick to a particular diet such as the DASH diet, Mediterranean diet, low-fat diet, and low-carbohydrate diet were better in either preventing or managing the heart disease. Hypertensive Finns who had stuck to the DASH diet, for instance, had their diastolic and systolic blood pressure reduced by 5.5 and 11.4 mmHg respectively. Restricting sodium in the diet magnified the reduction in the risk of hypertension. The diets worked in enhancing the automatic and vascular function and lowering of the left ventricular mass among aged patients with overweight issues. Based on the diet patterns one could state that elderly Finns should adhere to a dietary approach that includes high unsaturated fats, low carbohydrates, and high fiber (Nevárez, 2016).

Some nutritional supplements were also found to be useful in preventing CVD and are discussed under:

### *Salt and sodium*

A diet low in sodium was found to be good for those at the risk of CVD. Avoidance of the overconsumption of sodium sources such as table salt, soy, soups, and gravies was highly recommended. Those who took dietary salt in excess were at a higher risk of blood pressure.

#### *Antioxidant Vitamins*

Antioxidant vitamins were also found to play a critical role in the treatment of heart diseases. Vitamin C and E were found to reduce the risk of CHD by around 34 percent. Mixing the two vitamins with zinc, selenium, and beta-carotene helps reduce the risk of ischemic CVD by eleven percent. Daily intake of vitamin E (60 IU/day) could minimize the risk of CHD by approximately 36%. Elder men and women should, therefore, consume foods rich in vitamin C and E. An average of 100 UI/day of vitamin E and 700 mg/day of vitamin C is good for reducing the risk of CHD and mortality (Jyvakorpi, 2016).

#### *Plant proteins*

Proteins from plant sources such as soy protein, nuts, and legumes were found to be good in reducing cholesterol synthesis and premature atherosclerosis. Nuts contain the healthy mono and polyunsaturated fats that are beneficial in CVD prevention among the elderly. Plant sterols were also good as it helps lower LDL-C and the absorption of cholesterol. Elderly Finns should, therefore, consume lots of whole foods such as whole grains as they contain these essential sterols.

#### *Vitamin D*

A diet rich in vitamin D was seen to help with many diseases including the CVD. A diet that has a high concentration of oily fish averts deficiency of vitamin D. Elderly people could also get the vital vitamin from just basking in the sun as the human body usually converts solar ultraviolet B radiation into vitamin D3 (Mathers, 2013).

#### *Coenzyme Q10*

Coenzyme Q10 was seen to work as an antioxidant that helps fight free radicals and prevent peroxidation of lipids. Adequate intake of CoQ10 rich foods was seen to be essential in

improving the endothelial function. The study, however, noted that sufficient evidence does not exist to support the claim that CoQ10 reduces the risk of CVD.

### *Magnesium*

Magnesium which is naturally found in green leafy vegetables, nuts, soybeans, and whole grains was found to be good for CVD risky elderly. The recommended daily intake for men and women was seen to be 420mg/day and 320 mg/day respectively. Analysis showed that magnesium is inversely associated with mortality and morbidity for stroke and heart disease.

### *Omega-3 and fish*

The research established that fish consumption is inversely connected to CVD. Taking between 40 to 60grams of fish on a daily basis was enough to reduce CHD mortality among elder people. Omega-3 which is found in fish and some nuts were also found to help reduce hypertension, improve endothelial function and enhance plaque stabilization (Jyvakorpi, 2016).

### *Phytosterols*

Phytosterols were seen to reduce LDL-C concentration by around ten percent. An optimal dose of between 1.5 to 2.5 grams per day was seen to be appropriate and helpful for those at high risk of CVD.

## **7.3 Implying nurses' interventions through the goal attainment theory**

The researcher examined ten scholarly articles with the intention of assessing the nutritional interventions available for the prevention of CVD among elderly Finns. Most of these articles recognized the role of nutrition but did not give further details of the relationship. Five of the ten data sources had broad suggestions on the importance of nutritional interventions in treating CVD conditions among the elderly.

The researchers used the goal attainment theory as the main theoretical framework for the study. The theory recommends the use of a client-centered approach in handling most health-related issues (Wayne, 2014). According to the research model, both nurses and patients should properly

understand each other and their environment before beginning the goal-setting process. Nurses should play a key role in establishing human interactions between themselves and their clients who in the current case are elderly Finns. The interactions should be aimed at improving communication between the two parties, setting CVD risk reduction goals, and exploring the ways and agreeing on the necessary interventions (Wisniewski, 2013). According to King's theory, a nurse has to be fully responsible for the sustenance of the elderly's health. He or she should communicate with them in order to understand and help them set CVD treatment or prevention objectives and choose the appropriate methods of attaining the goals (Wayne, 2014). A nurse, in this regard, has to assess, implement, diagnose, plan and evaluate elder people in order to make a proper nutritional recommendation.

As dictated by King's theory, a healthy nurse-client rapport is important in reducing CVD risk among elderly Finns (Wisniewski, 2013). It is also essential that nurses commit to and engage elderly Finns in order to meet the pre-set CVD risk reduction goals. Nursing professionals should also ensure that they understand such kind of patients with respect to their nutritional backgrounds, social status, and genetic makeup in order to better suggest the best nutrition interventions for CVD elimination (Jyvakorpi, 2016). They should also assist the elderly by encouraging them to adhere to a healthy diet that is rich in vitamins, fiber, monosaturated fats and low in sodium and carbohydrates. They should involve the elderly's large family to assist attain the CVD prevention goals. The elderly Finns, on their part, should commit to the relationship by cooperating with the nurses. They should particularly get involved in the goal-setting process (Williams, 2017). In addition, elderly Finns should cooperate by providing all the necessary information in a truthful manner so as to help diagnose the root causes of their condition (Kiefte-de et al., 2014). Their families should help in establishing a conducive environment that is capable of encouraging, caring, and helping the elderly meet their CVD risk elimination goals.

## 8 CONCLUSION AND RECOMMENDATIONS

This chapter provides a summary of the main findings of the study. It also makes some of the recommendations that the author believes to be helpful in the reduction of CVD risk among elderly Finns. The recommendations are intended to assist policymakers to make informed decisions concerning the prevention, management, and treatment of cardiovascular diseases among the elderly Finns.

### 8.1 Conclusions

The study has established that elderly Finnish people are at the risk of cardiovascular diseases, among them coronary heart disease, hypertension, cardiac failure, stroke, and vascular dementia. The diseases were seen to be associated with the increased cases of mortality among the elderly people who had reached the age of 65. The study, however, found that these diseases can be prevented and treated by proper adherence to some diets rich in minerals, essential monosaturated fats, vitamins, and fiber. The study found the DASH diet to be critical in the prevention of CVD diseases. The DASH diet is made up of fruits and vegetables, white meats, low-fat milk products, nuts, and whole grains. It is also low in fat, sodas, sugar, and meat. The diet should be adhered to by those at higher risk of CVD.

Nutritional interventions were seen to be critical in reducing CVD in its different variants. Consuming a diet low in sodium, high in vitamin C, D and E were found to be critical in the management of CVD. Plant proteins, magnesium, and coenzyme Q10 were also found to be reducing agents for CVD. Those of consumed fish and omega-3 supplements, as well as phytosterols, could also minimize their chances of becoming hypertensive.

Foods such as whole grains, fruits, and vegetables were seen to contain the nutrients essential for lowering CVD risk. They also contained fiber which also significantly lowers CVD risk factors among the elderly people. Nuts, soy products, and fish are rich in unsaturated fats that help reduce the probability of CVD among elderly people. Research showed that taking nuts could lower CVD risk levels among elderly people. Soybeans were found to be good sources of B

vitamins, Zinc, calcium, iron, and fiber. The study indicated that soy products such as soymilk and soy meat may help reduce CVD risk. They also help lower cholesterol along with blood pressure and LDL because of their cardioprotective effects. Combined with other foods such as oats, nuts and sterol margarine, soy foods were found to be very effective as they lowered LDL cholesterol by 30%.

A healthy nurse-client rapport is important in reducing CVD risk among elderly Finns. It is thus necessary for nurses to commit to and engage elderly Finns in order to reduce CVD risks. Nurses need to understand their patients with respect to their nutritional backgrounds, social status, and genetic makeup. This would help them make better suggestions on how their patients can reduce CVD risk. They should also assist the elderly by encouraging them to adhere to a healthy diet that is rich in vitamins, fiber, monosaturated fats and low in sodium and carbohydrates. They should involve the elderly's large family to assist attain the CVD prevention goals.

## **8.2 Critical Evaluation**

The research established that nutrition plays a critical role in the management of CVD risk. However, the positive effects of nutrition on CVD incidence could have been better examined had the researcher gotten enough articles on the subject matter. This sounds wild but does not mean that the research findings are not valid or unreliable. The author had to use evidence-based scientific literature and at the same time comb through numerous articles in order to come up with reliable data sources.

Nutrition was found to be a wide topic, involving different nutrients all of which are essential to the proper functioning of the human body. In this regard, the research only covered the most important nutrients that were significantly related to the prevention of CVD. The study was also limited to information published between 2013 and 2018 as the researcher wanted to use only recent information. More recent articles from 2015 to 2018 did not contain all the necessary information and thus the researcher had to extend the literature search to 2013.

All evolving themes and categories were given equal attention in order to reduce bias and help achieve the element of research objectivity. The most relevant scholarly articles were chosen to

ensure credibility in the study outcome. The researcher had to use data from different time periods in order to achieve research reliability. In addition, the writer clearly described the research methodology with special attention being given to the selection of research units, data collection process, and analysis. This was to ensure that other researcher could employ the same methods in the future to test the applicability of the research results. The researcher is thus confident in the research process and believes that the results of the study are valid, credible, and reliable.

### 8.3 Recommendations

Based on the evidence pointing to the health benefits of nutrition, the study recommends that elderly Finns adhere to a healthy diet plan. The diet should include a diversity of foods. It is recommended that they consume fresh foods, without adding table salt, sugar or high-calorie gravies that are cooked using methods that do not destroy the original nutrients. The diet should be made up of a variety of fruits and vegetables, legumes, whole wheat bread, and whole grains. Vegetable oils, low-fat dairy products, and nuts that are rich in vitamins and minerals should be included in one's diet as they help fight CVD. It is also recommended that elderly people minimize the consumption of high-fat meat from animals but rather use white meats from chicken and fish. The DASH diet has been found to reduce the chances of CVD and is therefore recommended for use by nurses who deal with elderly people.

The researcher came up with a nutritional guide that should be used by nurses who deal with CVD patients. The below table contains the most important nutrients that the study assessed from the ten articles. The guideline is however not complete as the research is limited with respect to data sources.

<b>Nutritional Element</b>	<b>Recommendations</b>



<b>Sodium</b>	It is suggested that elderly people limit their salt intake to 2.3 grams of sodium (6 g/day salt). They should substitute table salt with other herbs and spices.
<b>Omega-3</b>	Elderly people who are at a higher risk of CVD should consider taking between 40 to 60 grams of fish on a daily basis.
<b>Phytosterols</b>	An optimal dose of between 1.5 to 2.5 grams per day is appropriate for those at risk of CVD
<b>Antioxidant-vitamin supplementation</b>	The study does not recommend the use of antioxidant vitamins for the prevention or treatment of CVD
<b>Vitamin C and E</b>	An average of 100 UI/day of vitamin E and 700 mg/day of vitamin C is recommended
<b>Vitamin D</b>	At this point, the study does not recommend the use of vitamin D in CVD cases
<b>CoQ10</b>	CoQ10 should not be used in reducing the risk of CVD since there is no strong evidence to support its effects on CVD
<b>Magnesium (Mg)</b>	Intake of magnesium should be limited to 420 mg and 320 mg for elder men and women respectively
<b>Total fat</b>	Daily intake should amount to 27% of total calories
<b>SFA</b>	RDA should total to 6% of total calories
<b>Carbohydrates</b>	RDA should total to 55% of total calories
<b>Protein especially from plant sources</b>	RDA should total to 18% of total calories

<b>Cholesterol</b>	Elderly people should consume 150 mg of good cholesterol/day
<b>Fiber</b>	31 grams of fiber should be included in an elderly's diet
<b>Potassium</b>	Potassium content in food should not exceed 4700 mg/day
<b>Calcium</b>	RDA for calcium should total to 1240 mg

#### **8.4 Suggestions for Further Research**

Owing to the fact that this study was limited to nutritional interventions for CVD among elderly Finns, the study recommends that other mechanisms for prevention of CVD be examined for proper guidance of elderly people. Prevention mechanisms such as the use of physical exercise and nitrates in the treatment were not catered for in this research and therefore their efficacy should be assessed as well.

The author further suggests that future studies be carried out to determine the diets rich in the identified nutrients. Such kind of studies should assist governments and policymakers to make the right decisions regarding CVD cases among elderly Finns. Besides, further studies should be with a view to stabling the extent to which nutritional interventions help prevent or treat CVD

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## APPENDICES

### Appendix 1: Article extraction process

Database used	Date of search	Search result	Duplicates eliminated	Exclusion after review of abstract and titles	Exclusion after the application of the Boolean modifiers	Full-text articles examined	Number of articles selected
PUBMED	9/10/2017	117	31	47	22	10	2
EBSCO	9/11/2017	83	25	17	8	2	1
Science Direct	9/13/2017	721	243	108	83	27	5
MEDLINE	9/14/2017	16	4	3	1	8	1
Google Scholar	9/15/2017	1479	396	417	352	12	1
Total		2453	710	594	466	59	10



## Appendix 2: Summary of the articles used in the study

Author	Title	Year	Journal Name
<b>Article 1</b> Virtanen et al.	Dietary fatty acids and risk of coronary heart disease in men: the Kuopio Ischemic Heart Disease	2014	Arteriosclerosis, thrombosis, and vascular biology
<b>Article 2</b> Sacks et al.	Dietary fats and cardiovascular disease: a presidential advisory from the American Heart Association.	2017	Circulation
<b>Article 3</b> Talvia, S	Family-based dietary intervention in the STRIP study—influences on diet and diet-related attitudes	2013	N/A
<b>Article 4</b> Savikko et al.	Secular trends in the use of vitamins, minerals and fish-oil products in two cohorts of community-dwelling older people in Helsinki—Population-based surveys in 1999 and 2009.	2014	The journal of nutrition, health & aging
<b>Article 5</b> Yary, T., Virtanen, J.K., Ruusunen, A.,	Association between serum zinc and later development of	2017	Nutrition

Tuomainen, T.P. and Voutilainen, S.	metabolic syndrome in middle aged and older men: The Kuopio Ischaemic Heart Disease Risk Factor Study.		
<b>Article 6</b> Suominen, Jyvakorpi, Pitkala, Finne-Soveri, Hakala, Mannisto, Soini, and Sarlio-Lahteenkorva	Nutritional guidelines for older people in Finland.	2014	The journal of nutrition, health & aging
<b>Article 7</b> Jousilahti et al.	Primary prevention and risk factor reduction in coronary heart disease mortality among working aged men and women in eastern Finland over 40 years: population based observational study.	2016	BMI
<b>Article 8</b> Jyväkorpi	Nutrition of older people and the effect of nutritional interventions on nutrient intake, diet quality and quality of life.	2016	N/A

<b>Article 9</b> Vartiainen, Erkki	The North Karelia Project: Cardiovascular disease prevention in Finland	2018	Global cardiology science & practice
<b>Article 10</b> Nevárez, Diana	Association between Diet Quality and Life Satisfaction in Finnish Elderly Women.	2016	N/A

