

Samuel Ischmicle Osei Owusu & Mareus Effectlacha

Heart Failure: Causes and Nursing Management

Literature Review

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Thesis Abstract

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Authors: Samuel Ischmicle Osei Owusu & Mareus Effectlacha

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Supervisor(s): MNSc, Lecturer Tanja Hautala & MSc, Lecturer Anna Maria Rauha

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The major causes of heart failure are abnormal heart valves, anemia, and heart defects at birth, coronary artery disease or myocardial acute infarction, heart rhythm disorders, drug-induced heart failure, chronic obstructive pulmonary disease, lifestyle factors and health conditions that could lead to heart disease. Therefore, health care providers' knowledge about current heart failure management guidelines and strategies are the cornerstone in the management of patients with heart failure. Emphasis on lifestyle modification, including weight management and knowledge on nutrition, are as important as medication in the management of heart failure.

This thesis aims at bringing out the causes and nursing management of heart failure, placing emphasis on nursing management. The purpose of the thesis is to describe the pharmacological and non-pharmacological methods of managing patients with heart failure through researchable materials.

A Systematic literature review process was used in the search for research materials and the materials were analyzed using inductive content analysis. The process facilitates information exchange between the patient and the health care professionals in efficient treatment and management of diseases.

The results can be used to efficiently manage patients with heart failure when used by health care providers to educate patients on medication, nutrition and weight management.

Keywords: Management strategy, heart failure cause, lifestyle modification.

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Abbreviations

HF	Heart Failure
MVP	Mitral valve prolapsed
DM	Diabetes mellitus
DCM	Dilated cardiomyopathy
LV	Left Ventricle
COPD	Chronic obstructive pulmonary disease
CAD	Coronary artery disease
AHRQ	Agency for Health Care Research and Quality
AHA	American Heart Association
ACC	American college of Cardiology

1 INTRODUCTION

Heart failure (HF) is a complex clinical syndrome that can result from any structural or functional cardiac disorders that impairs the ability of the ventricle to fill with or eject blood. Heart failure was chosen as the topic for this thesis work because of the growing number of heart failure cases in the elderly population, the hospitalization, and high healthcare cost to the budget of many countries, and, also, the many cases of heart failure cases encountered in the course of studies and practical training. (Pierce, Dalton, Duke & Spaniol 2009, 874-875.)

Heart failure is also often commonly used to explain other co-morbidities such as coronary artery disease, COPD, stroke/ transient ischemic attacks, renal failure and hypertension that affect the function of the cardiovascular system. The heart failure cases in the adults aged above 64 years in the US was 10 cases per 1000 of the population and in the UK there were 40-60 cases per 1000 in ages 70 years and above. (Alagiakrishman, Banach, Jones, Ahmed & Aronow 2013, 766-767.) This thesis work will seek to highlight causes and management of heart failure.

Heart failure has negative connotations because education on the subject, to the authors' opinion, is limited. It is used to describe the heart failure as a result of continuous heart depreciation of cardiac functions, fluid congestion, and tissue perfusion. The two major causes of heart failure are coronary heart disease and hypertension with some of their symptoms- breathlessness, fatigue and edema. (Lakasing & Francis 2006, 36-37.)

Part of the nurse's task in providing care to patients is to be able to know what heart failure is and identify from the symptoms patients who are at risk of heart failure and, together with the other multi-professional team members, to provide the necessary care needed by the patient. In providing the necessary health care needs, the nurse is also expected to motivate and give hope to these patients. (Pierce et al 2009, 884.)

2 Pathophysiology of Heart Failure

Heart failure can be caused by either the left-side of the heart, the right-sided or both sides may be involved. Systolic and diastolic dysfunction may be involved in the left-sided or right-sided heart failure. In left-sided heart failure, both systolic and diastolic dysfunction lead to decreased cardiac output and increased pressures in the left atrium and pulmonary venous system. The pressures cause congestion in the pulmonary which decreases blood oxygen. (Pierce et al, 2009, 874.)

Right-sided failure on the other hand is caused by ineffective blood pumped by right ventricle to the pulmonary system. The results are pulmonary hypertension or right ventricle myocardial infarction, increased right ventricular pressures and right ventricular hypertrophy. Explained in figure 1 are the pathophysiology and signs of the right-sided and left-sided heart failure. (Pierce et al, 2009, 874.)

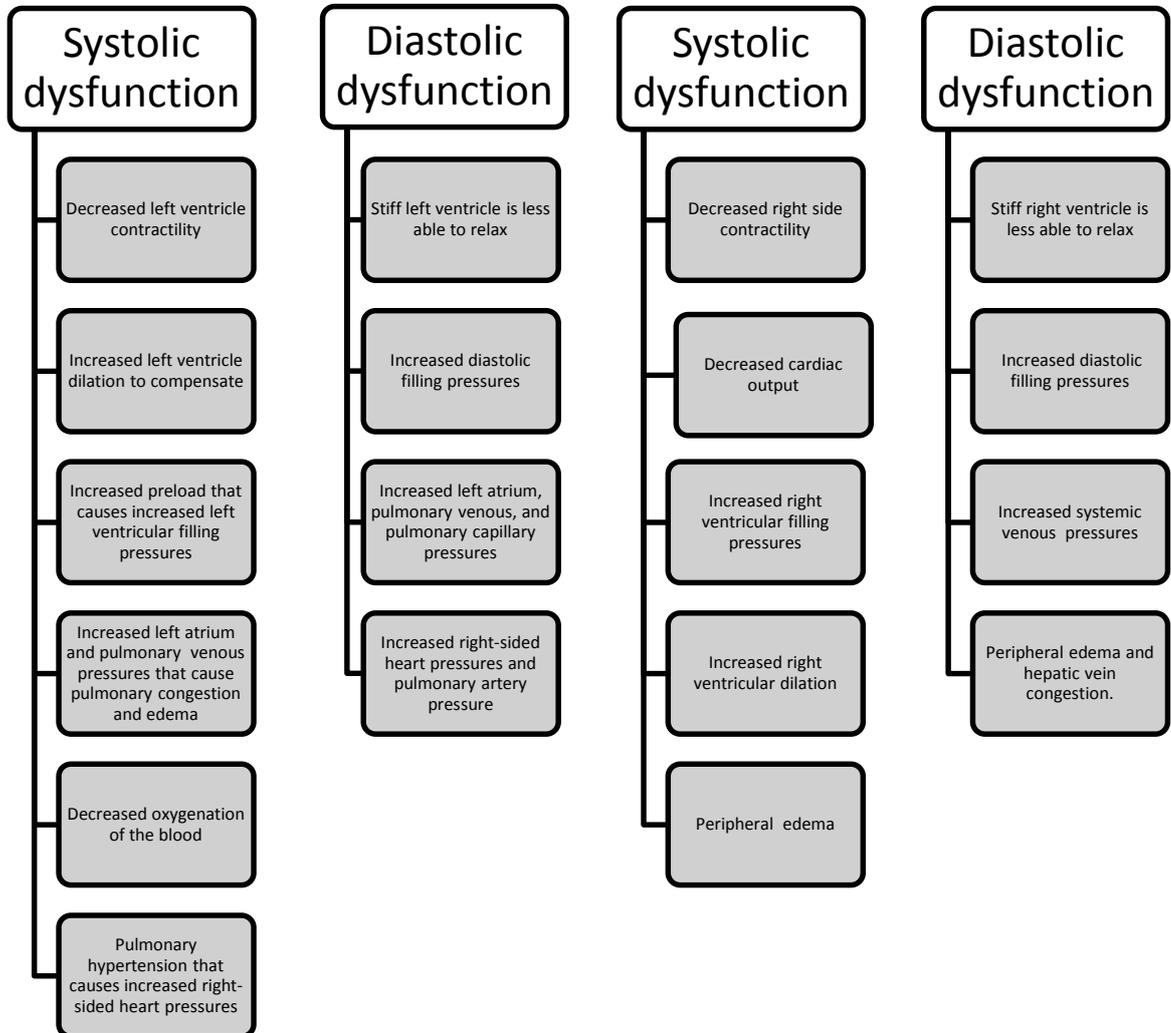
Table 1 Signs of heart failure According to Porth & Matfin 2009, 1688.

Left-sided heart failure	Right-sided heart failure
Tachypnea (that is, increased respiratory rate)	Peripheral edema
Increased work of breathing	Ascites (that is, excess peritoneal fluid)
Crackles initially heard in lung bases, but when severe, heard throughout the lung fields	Hepatomegaly (that is, enlargement of the liver)
Pulmonary edema	Increased jugular venous pressure
Dullness in lung fields to finger percussion	Presence of a parasternal heave indicating the compensatory increase in contraction strength
Pleural effusion detectable by reduced breath sounds at the bases of the lungs	Congestion of the gastrointestinal tract resulting in weight loss
Cyanosis suggesting hypoxemia	Impaired liver function

Figure 2 Pathophysiology of heart failure(According to Cardiol 2007,115-126)

left-sided heart failure

Right-sided heart failure



3 Causes of heart failure

Heart failure is a syndrome and, therefore, there are many heart conditions that lead to one having the disease. The heart conditions can be one and/or combinations of the following: abnormal heart valves (stenosis), anemia, heart defects at birth, coronary artery disease or myocardial acute infarction, heart rhythm disorders, drug-induced heart failure, chronic obstructive pulmonary disease, lifestyle factors that could lead to heart disease and health conditions.(Pierce et al 2009, 884.)

3.1 Abnormal heart valves

The normal operation of the heart valves involves a fully opening and completely closing of the valves at the appropriate time. Failure for these valves to open is called stenosis, and failure for them to close is insufficiency or incompetency. Mitral stenosis narrows mitral valve as a result of scar formation or congenital defect. Mitral valve prolapse (MVP) does not pose a serious threat, but it is one of the most common causes of mitral insufficiency and most valvular disorders. This causes a backflow of blood from the left ventricle into left atrium and affects more women than men in 30% of the population. Aortic stenosis causes the aortic valve to narrow, while in aortic insufficiency, blood enters the left ventricles as a result of blood backflow from the aorta. (Gerard & Tortora 2009.)

In addition, the normal operation of the heart valves can be destroyed by some infectious diseases which lead to stenosis or insufficiency. Rheumatic fever is one example where antibodies are triggered by immune response to attack some organs. The results are acute systemic inflammatory disease, inflamed connective tissues in the heart valves and other organs. The disease sometimes weakens the entire heart walls, but, in most cases, it damages both mitral and aortic valves (National heart, lung and blood institute 2011, 1.)

3.2 Anemia

Anemia is caused by abnormal low number of red blood cells with a hemoglobin concentration, 13 g/dl in men and 12 g/dl in women. Red blood contains proteins called hemoglobin which transport oxygen in the blood. A decrease in the number of red blood cells leads to insufficient oxygen supply to the heart and, at the same time, impairs carbon dioxide elimination. This causes the tissues in the heart to die, hence the heart fails (Goldman, Schafer 2011, 61.)

3.3 Health conditions

3.3.1 Hypertension

Hypertension has now been identified to be one of the leading comorbidities which cause diastolic dysfunction in the heart (Angeja & Grossman 2003; Baker 2002; and Connolly 2000). According to Beattie (2000), diastolic dysfunction is an alteration in cardiac properties that impairs the normal pressure-volume relationship in the left ventricle cavity during the diastolic phase of the cardiac cycle.

About 70% of known heart failure incidents in patients above 80 years are as a result of diastolic dysfunction because elasticity and great vessels in the heart decrease with aging (Torosoff & Philbin 2003). The result is increase systolic blood pressure which then causes myocardial stiffness, a physiologic contributor to diastolic dysfunction. (Hunt, Baker, Chin, Cinquegrani, Feldman, Francis, 2001.)

3.3.2 Diabetes

Diabetes mellitus (DM) doubles the risk of developing heart failure. A Framingham Heart study revealed that men with diabetes have twice and women five times, likelihood to develop heart failure than their non-diabetic counterparts (Maxwell & Jenkins 2011.) According to Maxwell and Jenkins (2011), this continues to exacerbate the syndrome, even if these other risk factors are controlled. A higher level

of blood sugar over a period of time leaves fatty material deposits inside the blood vessels. The deposits, with time, harden and clog the blood supply to the heart (National institute of diabetes and digestive kidney diseases 2014). It is not completely established, but cardiac metabolic dysregulation of glycolysis and fatty acid oxidation probably impairs cardiac functions in the heart and leads to myocardial dysfunctions. Chemical components used in drugs, such as thiazolidinediones rosiglitazone and pioglitazone were thought to be helpful in the treatment of diabetic patients with heart failure because it reduces blood glucose level.(Maxwell & Jenkins 2011.)

However, findings into preclinical trials showed that the opposite is true. These agents cause edema and weight gain in patients, thus exacerbating the heart condition (Maxwell & Jenkins 2011). Also, sulfonyureas and insulin could increase dysregulation of myocardial metabolism and damages the function of left ventricle (National institute of diabetes, digestive and kidney diseases 2014). Over time, high blood sugar levels can damage and weaken the heart muscle and the blood vessels around the heart, leading to heart failure. (Maxwell & Jenkins 2011).

3.3.3 Hyperthyroidism

Hyperthyroidism occurs when endogenous thyroid hormone secretion is in excess (National heart lung and blood institute 2011, 6).In hyperthyroidism, increase in tissue metabolism, low systemic vascular resistance and increase in total blood volume have a corresponding increase in cardiac output. Increase cardiac output also increases resting heart rate, thus increasing systolic blood pressure and the workload of the heart (National heart lung and blood institute 2011, 5.)

The effects of this thyroid hormone excess on the cardiovascular system are exhibited in many signs and symptoms including sinus tachycardia, left ventricle dysfunction and heart failure. Hyperthyroidism due to Graves' disease with symptoms such as heat intolerance, weight loss, sweating, tremors and hyper defecation could lead to heart failure if gone untreated.(Riaz, Forker, Isley, Hamburg & McCullough 2003, 40.)

3.3.4 Infections

Endocarditis is an infection in the heart chamber and valves. Infective endocarditis occurs when the inner lining of these parts of the heart are infected by bacteria, fungi and other germs which have invaded the blood stream (National heart lung and blood institute 2011, 1). Myocarditis on the other hand is an infection that causes inflammation in the cardiac muscle. Myocarditis is mostly caused by viral infections, but it can also appear as a result of other pathogens, cardiotoxics or hypersensitivity drug reaction, or autoimmune reaction. (Hazebroek, Dennert & Heymans 2012, 249.)

These germs attach themselves to cells and matters in the blood to form clumps (vegetations). As these germs keep multiplying in the heart, the clumps also multiply and increase in size. Clumps broken from these vegetations travel in the blood and can block blood flow to the heart leading to heart failure (National heart lung and blood institute 2011, 1). An untreated myocarditis evolves itself to dilated cardiomyopathy (DCM) leading to chronic heart failure. (Hazebroek, Dennert & Heymans 2012, 249.)

3.4 Life factors

3.4.1 Sedentary lifestyle

A sedentary lifestyle, such as prolonged periods of sitting or sleeping, has a negative effect on the body's metabolism. The associated metabolism effects are abnormal glucose and fat metabolism. The residual glucose in the blood leads to obesity, diabetes, higher cardiovascular diseases and premature deaths stemming from heart failure. (Alspach 2015, 14.)

3.4.2 Alcohol

Consumers of alcohol between seven and eight standard drinks per day for less than 5 years risk developing asymptomatic alcohol cardiomyopathy (ACM), which means impairment of the left ventricle in non-symptomatic stage. The symptomatic stage is reached when alcohol usage is continues and heart failure signs and symptoms developed. Dilated left ventricle (LV), normal or reduced LV wall thickness, and increased LV mass are some of the signs characterized by ACM. Although excessive alcohol use could lead to ACM, fortunately not all excessive users develop ACM. (Laonigro,Correale, Baise & Altomare 2009, 454.)

Moderate consumption of alcohol crude analyses done by Survival and Ventricular Enlargement (SAVE) in 2231 patients, who have suffered a myocardial infarction with dysfunction in the left ventricle revealed a lower heart failure incidence. (Abramson, Williams, Krumholz and Vaccarino (2001, 1971–1977), consumption of 21-70 oz. of alcohol per month reduces heart failure risk by 47%. Finally, a prospective follow up on 21601 patients from 1982 to 2005 with no antecedent of coronary artery disease, revealed no relationship between moderate alcohol use and heart failure. This data is an indication that moderate use of alcohol may lower the risk of heart failure. (Abramson et al 2001, 1971–1977.)

3.4.3 Smoking

Smokers are predisposed to many clinical atherosclerotic diseases such as stable angina, myocardial infarction and other acute coronary syndromes. The risk to heart diseases is higher in heavy and longtime smokers. Most injuries and dysfunction to the endothelium in the peripheral and coronary arteries could be a result of smoking. One cigarette smoked may cause short- term increase stiffness in the arterial walls which, in turns, increases the risk of plaque rupture. This plaque rupture forms blood clots which could block the flow of blood to the heart. (Tonstada & Johnstonb 2006, 508.)

3.4.4 Drug Abuse

'Recreational drugs', as is popularly known, affect the functions of the nervous system with a relating cardiovascular effect. Cocaine and other inhalants users suffer from abnormal heartbeat which could lead to fetal arrhythmia. Heroin and opiates (opium) use may also result in fetal respiratory depression (lung failure) and corresponding short of oxygen supply to the heart. Chest pain syndromes, heart attacks, heart failure, aortic dissection and fetal (non-fetal) arrhythmias are some of the cardiovascular complications associated with cocaine use. (American Heart Association 2005.)

3.5 Drug-Induced Heart Failure

The use of some chemical agents used for pharmaceutical purposes could lead to heart failure. Although it is hard to determine the specific incidence of the drug related heart failure, because users may have other potential risk factor that could lead to the on-set or exacerbation, it is recommended for these users to be monitored when prescribed these medicines. (Maxwell & Jenkins 2011.)

Agents, such as thiazolidinediones, thought to be helpful in the treatment of diabetes, are also found to increase patients weight and fluids (edema), which leads to the on-set of heart failure condition. Chemotherapeutic agents (anthracyclines and cyclophosphamide) cause on-set, chronic or progressive cardio toxicity (cardiomyopathy) and the side effects are manifested within early stages of drug use. (Maxwell & Jenkins 2011.)

Also, users of the above mentioned drugs still have future risk of the drug's side effects, even when medications are stopped in the early stage. Late on-set, chronic or progressive of cardiotoxicity could develop into heart failure. Finally, other drug induced heart failure include biological agents, nonsteroidal anti-inflammatory drugs, antiarrhythmic agents, glucocorticoids, calcium-channel antagonists, antifungal agents, appetite suppressants, miscellaneous agents (Maxwell & Jenkins 2011.)

3.6 Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) affects how gases are exchanged in the lungs. The gas exchange process allows blood in capillaries that run through the air sacs walls, to receive oxygen and, at the same time, eliminate carbon dioxide from the blood. In the case of COPD, bronchioles are clogged with an abnormal mucus amount. (National heart lung and blood institute 2011.)

This abnormal amount causes them to lose their shape and effectiveness to conduct air from the bronchi to alveoli preventing gas exchange. COPD causes many airways and air sacs to reduce their elastic quality and also damages walls between air sacs. These cause breathing difficulties and prevent gas elimination in the blood. (National heart lung and blood institute 2011.)

Chronic obstructive pulmonary disease is indicated by low-grade systemic inflammation that can lead to the gradual on-set of atherosclerosis and other detrimental cardiovascular diseases. (Heart failure and chronic obstructive pulmonary disease: diagnostic pitfalls and epidemiology (Hawkins, Petrie, Jhund, Chalmers, Dunn, & McMurray 2009, 135).Figure 3 below shows how COPD leads to heart failure (According to National heart, lung and blood institute 2011.)

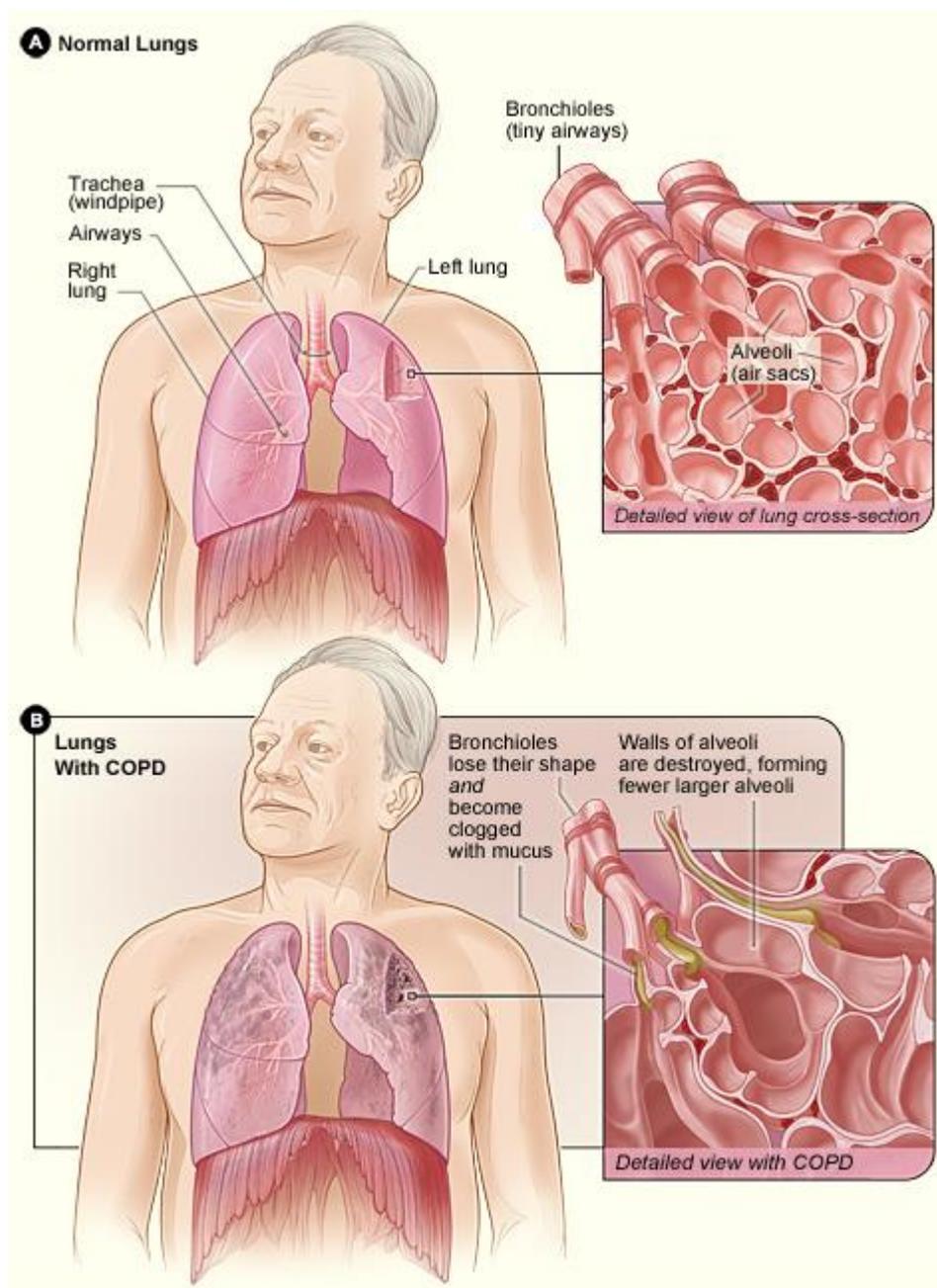


Figure 1 COPD leading to heart failure(According to (National heart lung and blood institute 2011.)

3.7 Coronary Artery Disease

Coronary artery disease (CAD) is caused by plaques built up in the coronary arteries (atherosclerosis) which harden with time and rupture. Clots formed after the rupture block or reduce the supply of enriched oxygen blood to the heart. Blood not reaching the heart causes heart attacks and/or angina. The CAD causes the heart muscles to weaken overtime and the heart loses its ability to pump blood needed for circulation (National heart lung and blood institute, 2011.)

Findings by the Framing Heart Study revealed that CAD has now become the most common cause of heart failure and not hypertension or valvular heart disease as thought decades ago (Lloyd-Jones, et al 2002,1202). The existence and severity of CAD also increases the risk of heart failure, hence the higher deaths in ischemic patients than non-ischemic patients (Gheorghide, 2006, 1203) . Figure- gure 4 below shows how CAD leads to heart failure (National heart, lung and blood institute 2011.)

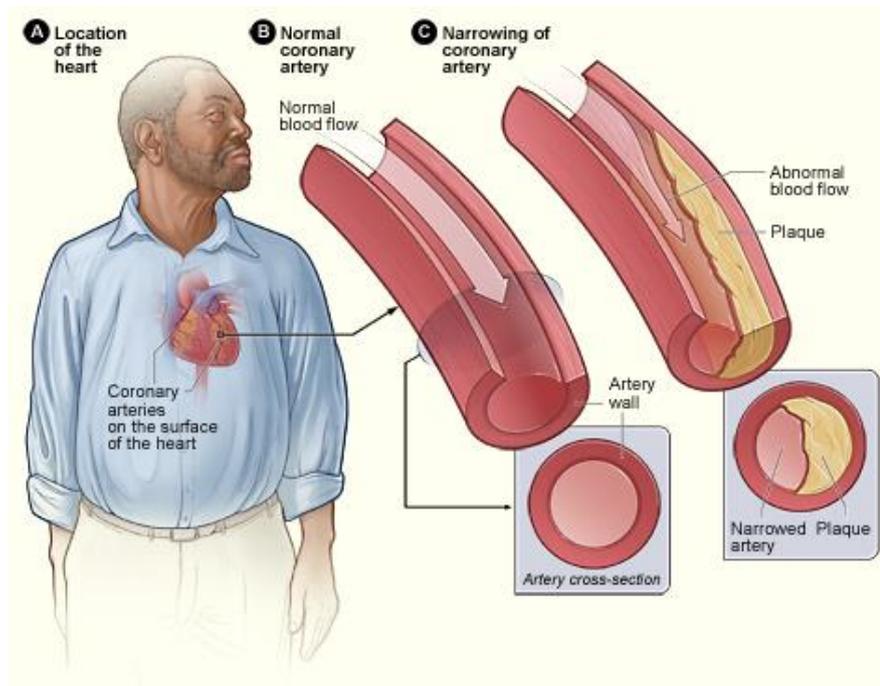


Figure 2 Atherosclerosis leading to heart failure (According to (National heart lung and blood institute 2011.)

3.8 Defect from Birth

Congenital heart defect is the known common cause of birth related heart defect. It is recorded, in the US, to affect 8 out of every 1000 births making a total of more than 35,000 babies a year. Although this can be treated with an early diagnose, people with complex defect continue to need special heart care throughout their lives. (National heart lung and blood institute 2011.)

Congenital heart defect is difficult to explain why it occurs, but the causes could be heredity, genetic disorders- half of all children with Down syndrome have this defect, and smoking during pregnancy. Congenital heart defect affects the heart halves leading to abnormal heart valves functions. (National heart lung and blood institute 2011.)

4 Nursing Management of Heart Failure

Governments are constantly looking for effective, quality and cost-efficient ways to provide and manage the complicated health care needs of their population (Wipf & Langner 2006, 452). Nursing management systems/programs have emerged as the most comprehensive way to decrease health costs and, at the same time, increase the quality of care for the populations with chronic diseases (Atkinson & Branum 2001, 106).

Nursing (disease) management is a long term strategy of programs that coordinate health care interventions and communications that require patient self-care efforts, collaboration with healthcare practitioners and providers, as well as guideline-based care to the populations. Nursing management programs have come up as a result to provide care that aims to take a long-term view at the chronic and progressive nature of diseases in a fiscally sound way, than dealing with episodic presentations of increased symptoms. (Atkinson & Branum 2001, 106.)

Programs used in nursing management of heart failure are pharmacological and non- pharmacological evidence-base guidelines developed by the Agency for Health Care Research and Quality [AHRQ], and the American College of Cardiology/ American Heart Association [ACC/AHA]. These guidelines provide in-depth strategies in understanding the pathophysiology of heart failure with associated symptoms and, also provide recommendations in medications, dietary activity and exercise to effectively manage heart failure. (Washburn & Hornberger 2008, 263.)

5 THE GOAL AND PURPOSE OF THE THESIS

5.1 Goal

The goal of the thesis is to find the causes and nursing management of heart failure.

5.2 Purpose

The purpose of the thesis is to explain the pharmacological and non-pharmacological strategies of managing patients with heart failure through researchable materials. Readers of this thesis will be provided the understanding into patients having heart failure and the coping models for the disease. The writers will be able to understand the causes and nursing interventions of heart failure.

5.3 Research Questions

What are the causes of heart failure?

What is the nursing management of heart failure?

6 SYSTEMATIC LITERATURE REVIEW

Data collection method of the thesis is the literature review. By literature review is meant the process of selecting topic, finding both relevant research and non-research material, reading the material, and finally analyzing it. After evaluation the material it is combined and summarized to the thesis. (Literature review 2012.) Ave-yard (2010) point out that literature review summaries all the literature which is available on the topic

Literature review is a kind of review in which many previous literatures are reviewed related to a definitive topic (Cronin et al 2008). The main aim of literature review is to incorporate results of various studies done related to same topic (Ridley 2012). In a literature review the time frame should be mentioned about when the literature was selected (Parahoo 2006).

Literature review was selected as the data collecting method for the thesis since this kind of literature review provides evidence-based information which then can be further implied on practice (Ridley 2012). Cronin et al (2008) mention that at first the reviewer should form a research question and then mention clear inclusive and exclusive criteria. The reviewer should find out good articles which answer the research question. Finally, the material should be analyzed and the findings mentioned distinctly.

Cronin et al (2008) have mentioned five steps in doing literature review. At first the reviewer should select a topic which is followed by searching for the literature related to the topic. Thirdly, all the articles should be gathered, gone through all the selected articles and analyze them. The reviewer should then write the review and finally reference should be mentioned.

Literature search

The systematic literature review started with the determination of the research task. The search of the literature was carried out in the following data bases: EBSCO CINAHL with full text, PUBMED Medline and SAGE database. The searched words used where: Heart failure, causes of heart failure, Nursing management of heart failure, causes and nursing management of heart failure.

5.4 Data Screening

The search for articles was limited to the published year from 2005 to 2015. The publications of the articles were limited to Finnish and English language respectively. Finnish language was considered as an inclusion criteria in order to avoid language bias. There is a possibility for a language bias if the data being searched is exclusively in English. The researched articles were available free and full and were relevant to the research question (Johansson et al 2007, 53.)

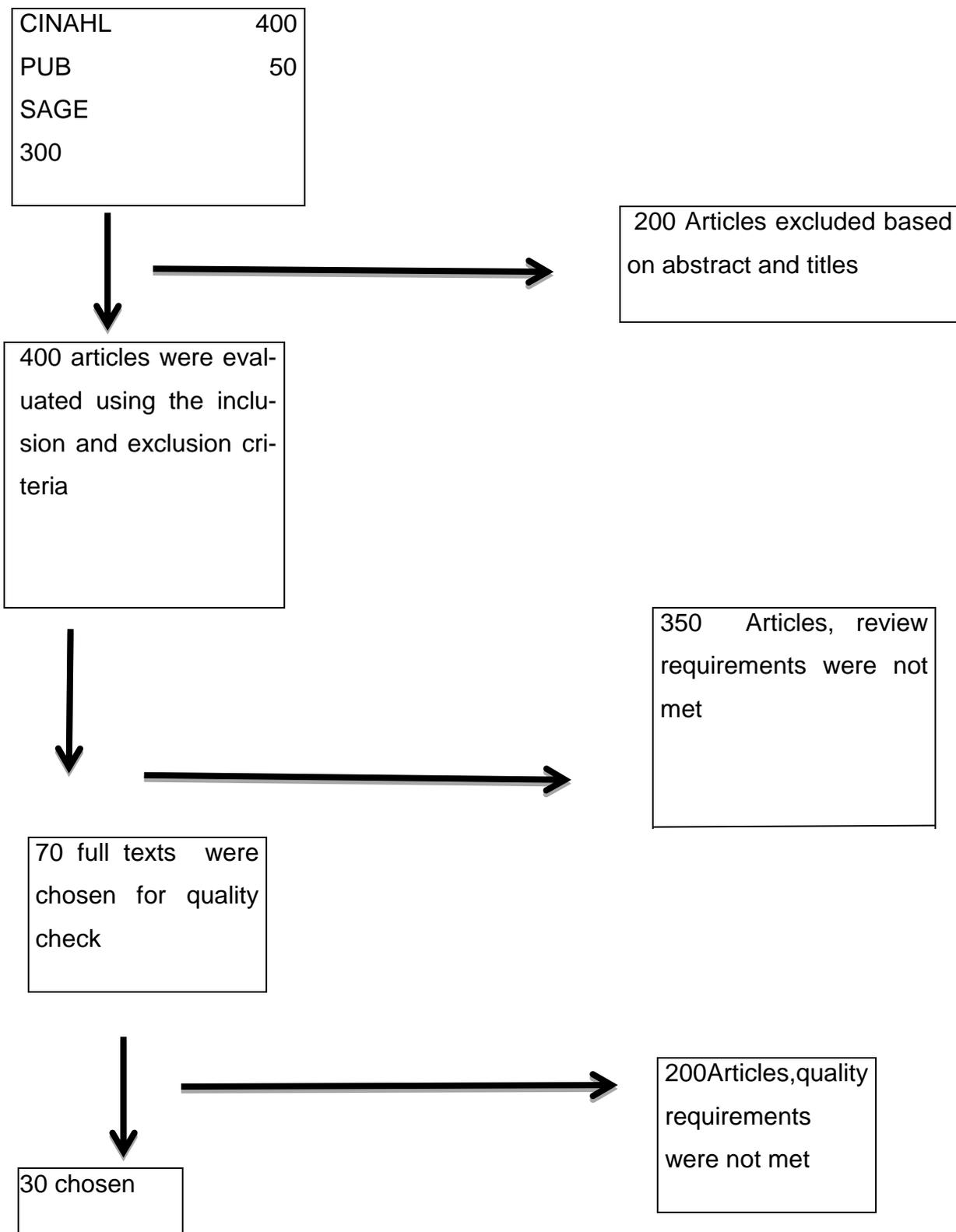
Table 5 Criteria for Inclusion and exclusion

Inclusion	Exclusion
Adults from 35years old and above	Children and Adolescence
Literature review from 2005-2015	Not before 2005
Online sources from 2005-2015	Not before 2005
Evidenced based research	None evidenced based research
Articles written in English and Finnish	Articles written in other languages

The words were used initially as separate entities and later as a combination of the words. The searched words were deduced from the research question. The results gotten from the search were evaluated on a number of factors ranging from titles and abstract, to inclusion and exclusion, full text and, finally, on the quality of the material.

Our searches resulted in 750 articles, 400 articles from EBSCO CINAHL with full text, 300 from Sage database and 50 from PUBMED Medline database. Filters and limiters provided by the above databases were used according to the inclusion and exclusion criteria. The filters helped to narrow the articles amount to those written in English and Finnish, which are freely available and published between the years 2005-2015.

Figure 3 Search process for literatures



5.4 Content Analysis

Inductive content analysis

According to Elo & Kyngas (2007), Content analysis is a systematic and objective means of describing and quantifying phenomena. Content analysis is also a method of analyzing documents that allows the researcher to test theoretical issues to deepen understanding of the data (Cavanagh 1997 108). Content analysis is used for making replicable and valid inferences from the data with the purpose of providing knowledge, new insights, a practical guide to action, and a representation of the facts. (Elo & Kyngas 2007.)

Preparation, organizing and reporting being the three main phases of content analysis where the main feature is that the many words of the text are categorized into much smaller content. The preparation phase begins with selecting the unit of analysis. (Polit & Beck 2004,109.) says this can be a word. Making a decision on what to analyze in what details and sampling considerations are other important considerations before choosing the unit of analysis. When using inductive content analysis, next step is to organize the qualitative data which includes open coding, creating categories and abstraction. (Elo & Kyngas 2007).

Open coding means notes and headings are written in the text while reading it. The written material is read through again and as many headings as necessary are written down in the margin to describe all the aspects of the contents (Hsieh & Shannon 2005,109.) The headings are collected from the margin on to coding sheets and categories are freely generated in this stage. The lists of categories are grouped under higher order of heading with an aim of reducing the number of categories by collapsing the similar or dissimilar into the broad higher order categories. (Elo & Kyngas 2007).

The purpose of creating categories is to provide means of describing the phenomenon, to improve understanding and to generate knowledge (Elo & Kyngas 2007). In the thesis a main category, three generic category and 13 sub categories were

formulated using inductive content analysis. In this section of thesis process, the authors sought to answer the questions based on compiled data from the literatures. The figure 4 demonstrates how the authors were able to develop themes and provide answers to the research questions.

Table 4: Example of inductive content Analysis

Subcategory	Generic Category	Main Category
Nurses being Knowledgeable about current heart failure management guidelines	Care provider's knowledge	Models of heart failure Management.
Multiprofessional team providing treatment regimes to heart failure patients and their families		
Provision of dietary guidelines both oral and written to heart failure patients	Nutritional Education	
Given heart failure patients high calorie drinks		
Using Mini Nutritional Assessment tool to test Malnutrition.		
Equip heart failure patients with the importance of salt reduction intake.		

Subcategory	Generic Category	Main Category
Drugnames, purpose for usage, and sideeffects of medication should be provided to Heart failure patients.	Education on Medication	Models of Heart failure management.
Lifestyle modification	Weight management.	
Exercise, reduces neurohumoral activation and inflammatory responses.		

6 Results

In the process of answering the preliminary question of the thesis, four holistic models used in the management of heart failure were clearly emphasized. They were care provider's knowledge in managing the condition, nutritional education, medication and weight management.

6.1 Care provider's knowledge

The management of heart failure cases mostly happens in environments where medical professionals are absent, hence, the need to give all necessary education and information on the guidelines in the management of heart failure to patients is important.(Washburn & Hornberger 2008, 263.)

The guidelines recommend a multi- professional team approach, which includes dieticians, clinical pharmacist, social worker, physical therapy, nurses (the coordinator) and local health center representatives. The team helps in providing understanding to patient and their families, and implementing treatment regimens. (Washburn & Hornberger 2008, 263.)

The nurse plays an important role in providing given patient education in many health care settings. Therefore, it is imperative that nurses providing heart failure education are knowledgeable about current heart failure management guidelines. Two studies published revealed that nurses who regularly cared for patients with heart failure had limited education on the essential principles for self-management. (Washburn & Hornberger 2008, 263.)

When nurses and caregivers acquire adequate knowledge about heart failure, patients are also empowered to self-manage the illness through education and participation in management decisions. The approach led to patients following treatment plan and involving in practices and behaviors which improved health and clinical outcome. (Washburn &Hornberger 2008, 264.)

6.2 Nutritional Education

Sustaining the nutritional needs of heart failure patients has many impediments and can have a significant effect on the progression of the disease. If the situation is not corrected it may lead to an early death. Health care professionals treating heart failure cases need to have in-depth knowledge about diet and food intake which could affect nutritional interventions. Although there are no guidelines on managing nutritional intervention, tailored made dietary guidelines in both oral and written form should be given to heart failure patients. (Washburn and Hornberger 2008, 265.)

Heart failure patients living independently require the same amount of daily calorie intake as their healthier counterpart. However, it is well documented in HF patients to be having higher resting energy expenditure that can elevate the risk of malnutrition. Malnutrition in HF patients can lead to cardiac cachexia if prolonged. A decision can be made to orally feed nutritional supplements to patients identified to be malnourished. HF patients needing additional nutrition can be given high calorie drinks. The nutritional supplement may stop or reverse cardiac cachexia associated with weight loss. (Shepherd 2011, 178-180.)

Nutritional intervention begins with a holistic assessment of diet and the patient's nutritional status, factoring in patient's medical, cultural and social views. In the UK, the malnutritional Universal Screening Tool (MUST) is most commonly used in nutritional screening. The Mini Nutritional Assessment Tool is used as well. (Shepherd 2011, 178.)

Nutritional requirements and recommendations in heart failure management help reduce the inflammatory processes that increase heart failure risk. In dietary carbohydrate, a high blood glucose level which can exacerbate cardiovascular disease and hospital admissions for patients with progressive chronic heart failure should be carefully controlled. Health care professionals should know how to use the glycaemic index (GI) classification of different types of carbohydrates in food and which serves as tool for patients to control their blood glucose level. (Shepherd 2011, 179.)

Dietary protein impacts greatly on the amount of skeletal muscle, other organs and tissues in the body, but it is recommended to give amino acids supplements (building blocks of protein) which are anti-inflammatory and antioxidant, than simply giving heart failure patients a general dietary protein. Amino acids supplements are found to improve exercise capabilities older people with chronic heart failure. Again, pro-inflammatory amino acid (homocysteine) is produced in body using vitamin B. Homocysteine is now called the 'new cholesterol', which is found to be high in plasma when vitamin B is deficient. High plasma homocysteine is associated with developing heart failure. (Shepherd 2011, 179.)

The amount of fat in a diet has less significance compared to the type of fat used or consumed. The type of fat is important role in determining the risk of cardiovascular disease and can contribute to the inflammatory process. Oils with omega 3 are dietary fat with strong anti-inflammatory and cardioprotective agent. Many clinical trials concluded, after evaluation, that omega 3 reduces the risk of death in heart failure patients when used in the treatment. Another recent systematic review also put a lime light on the benefits of omega 3 supplements on the physiology of heart failure patients. (Shepherd 2011, 179.)

There is the need to reduce the salt intake in heart failure patients requiring diuretics for fluid retention. Studies conducted by Albert et al and Washburn et al revealed nurses treating heart failure cases had the understanding for the need of low-sodium diet. Although not many studies have been conducted to evaluate the recommendation and effectiveness of a restricted sodium diet, it has been used as the standard in heart failure management. (Washburn et al 2008, 265.)

Dietary daily salt intake of 2-g is recommended to heart failure patients, although 2-g daily sodium diet is very unpalatable and expensive. Dietary regimen for such patients is much more managed when daily salt intake is completely avoided. Patients are advised against the use of salt substitutes, because potassium found in such substitutes may react negatively with heart failure medications such as diuretic spironolactone. (Shepherd 2011, 180.)

Also, medications [angiotensin-converting enzyme (ACE) inhibitors, angiotensin-receptor blockers, or aldosterone inhibitors] used by patients with high level serum potassium can be dangerous with potassium based salt substitutes. Consuming alcohol is not recommended for heart failure patients because it causes acute ingestion which depresses myocardial contractility. Patients finding it hard to completely quit the habit are advised to consume 30ml of liquor (or its equivalent in beer or wine) per day. (Washburn and Hornberger 2008, 265.)

6.3 Education on medication

Guidelines provided by AHRQ recommends that heart failure patients are given education about the names of the drugs used in the heart failure management, the dosage, the purpose, frequency and the corresponding side effects. It is important that health care professionals giving treatment to heart failure patients have understanding of the various drugs used in the management of the condition. (Washburn & Hornberger 2008, 266.)

Patients comply with the drug regime when they are assisted by nurses with the knowledge acquired. Nurses should advise patients to make known all the prescriptive and non-prescriptive medications. The drugs are assessed and reviewed with patients to evaluate their understanding and, identifying medications duplications, doses confused or omitted. The review is also needed to advise patients on non-prescriptive medications that could affect heart failure management. (Washburn & Hornberger 2008, 266.)

6.4 Weight management

Holistic model used in the management of heart failure places emphasis on lifestyle modifications and psychosocial support. This has been a significant shift from the prescriptive medical model (National Institute for Health and Care Excellence (NICE) 2010). Essential to the care of heart failure is the aspect of weight management and the value of exercise with an increased evidence of efficacy and safety of exercise programs. (Milligan 2013, 1242.)

The advantages of exercise to heart failure patients have been proven with substantial body of empirical evidence. Meta-analysis of clinical benefits demonstrated the reversal of left ventricular remodeling occurring secondary to aerobic exercise. The advantages also included low mortality and morbidity in the population with an improved quality of life. The symptoms, quality of life and autonomic balance are enhanced; neurohumoral activation and inflammatory response are reduced; exercise capacity is also increased. (Milligan 2013, 1242.)

Nurses treating heart failure patients should know weight gained due to fluid retention is a significant indicator of worsening heart condition requiring immediate treatment and is the common symptom for heart patients to be hospitalized. Nurses' lack of knowledge about weight management or fluid monitoring will inhibit nurses' ability to provide patients with accurate and critical information that could prevent hospitalization and needless health care contact. (Washburn & Hornberger 2008, 265.)

Patients with the condition, as part of managing weight, are advised to have a bathroom scale and weigh themselves wearing the same cloth each morning at the same time after they have urinated. Also, part of educating the patients is advising them to inform nurses or health care providers of any weight gained of at least 1kg in 2 days or 1-3kg weight gained over a week. Again, the weight assessment includes the comparison of daily weight measurements with standard value (dry weight). (Washburn & Hornberger 2008, 265.)

7 Discussion and conclusion

7.1 Reflection on results

The number of heart failure cases will continue to increase as the population ages and people survive initial cardiac problems as a result of an unhealthy lifestyle and general heart conditions. It is, therefore, vital that the aspects of heart failure management is highly prioritized and addressed given the high mortality, decreased productivity and high health costs that come with the condition.

The literature review outlined four major management models that could be adopted in the heart failure management process. Earlier mentioned is the need to educate patients with heart failure. Effective patient education can only be achieved when nurses and care providers offering the education have the knowledge and skills to create and implement the necessary practical and educational treatment regimens. This can be guaranteed when the educators have an up-to-date knowledge about current guidelines and recommendations in the management of heart failure.

Again, nutritional guidelines forms are crucial part of the care and management of heart failure patients and so the guidelines must be available to patients. Practical advice should also be given to breathless patients at mealtimes. Many studies in recent years demonstrate the need for regular exercise such as walking or cycling, which are deemed safe for patients whose conditions are stable. Patient educators should encourage heart failure patients to be active and, also, highlight on the benefits of the activities in improving their health and quality of life.

Finally, patients should be provided information on medication and how it should be taken. There is also the need to explain clearly to the patients when to take the medication and what to avoid when they are taking the medications. This will avoid unnecessary drug reactions and hospitalization. Patients and care givers should be involved in management plans for education and interventions. This will empower them to self-manage their illness and increase compliance with heart failure management plans.

7.2 Conclusion

The knowledge of the pathophysiology about heart failure is increasing continuously and so are the management and treatment programs. There are several heart failure guidelines and recommendations to assist health care providers to treat and manage effectively heart failure patients. The findings of the literature review is to highlight the importance of educators' knowledge, patients' nutritional needs, medication and weight management in managing heart failure.

7.3 ETHICAL AND AUTHENTICITY ISSUES

In this thesis, we have closely read previous literature and have endeavored to maintain the original idea of the authors. Plagiarism has been avoided at all stages of the project. The thesis has been organized according to the university guidelines and periodic correction was done with our tutor.

Our research is a call for concern to the population living with heart failure by developing management strategies to reduce the growth based on previously done research. This research is a valid study material for professionals in health care providing direct care to the population and heart failure professionals in particular.

7.4 Limitations

Meeting for discussion on searched materials was difficult due to individual time schedule, but this was compensated using other means of communication. Also, limited experience to analyze and do research works was apparent. Interpretation of results should have been done carefully due to some missing information and limited experience.

The majority of the research materials were gotten from electronic databases which did not cover all the articles, since there was always the chance of missing important articles. Due to the constraint of year published, language and limited articles, we might have missed some important articles.

7.5 Recommendation

Further research on medication, nutrition, nurses' knowledge and weight management in the management of heart failure patients is recommended. Making heart failure management guidelines and education available and accessible might improve the lifestyle and health of the population. This will reduce chronic diseases and other comorbidities and can increase the life expectancy of those diagnosed with heart failure.

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