CHAPTER – I

INTRODUCTION

Chronic diseases in India account for about 53% of all deaths and 44% of disability-adjusted life years (DALYs) with estimates of such deaths likely to register a sharp increase of over 8 million in 2020 from less than 4 million in pre 2000 era.

‘Working towards wellness: An Indian perspective’, states that India’s loss in terms of losing potentially productive years due to deaths from cardiovascular diseases in people aged between 35-64 years is one of the highest in the world. By 2030, the loss is expected to rise to 17.9 million years which is 940% more than the loss estimated in the USA.

The projected foregone National Income for India due to heart disease, stroke and diabetes during the period 2005 – 2015 is estimated to be more than $200 billion. The deaths from chronic diseases worldwide are expected to increase by 17% over the next 10 years, from 35 million to 41 million, caused largely by an ageing population and increasing numbers of people exposed to the risk.

It is also estimated that of the 64 million estimated deaths in 2015, a staggering 41 million will be from chronic diseases. Effective interventions are possible at a reasonable cost and emphasis should be on primary prevention. Health standards can be improved without heavy reliance on a sophisticated health system, which is often not available in developing countries.
Coronary artery disease (CAD) is becoming a major health challenge in India. The increase in the incidence of coronary artery disease is thought to be secondary to the effect of modernization. Modernization results in increased levels of stress, affluence, which in turn brings about changes in eating habits and levels of exercise. The aging, dietary changes and less physical activity are leading to more heart disease and stroke.

Cardiovascular disease (CVD) is the most common cause of death worldwide. Today, men, women and children are at risk, and 80 percent of the burden is in low- and middle-income countries. By 2020 heart disease and stroke will become the leading cause of death and disability worldwide, with the number of fatalities projected to increase to more than 20 million a year and to more than 24 million a year by 2030. (Atlas of Heart Disease and Stroke, WHO, September 2004).

The worldwide prevalence and incidence of heart failure (HF) are approaching epidemic proportions, as evidenced by the relentless increase in the number of heart failure hospitalizations, the growing number of HF attributable deaths and the spiraling costs associated with the care of patients with HF. According to the American Heart Association (AHA 2002), heart failure affects more than 4.9 million persons in the U.S. and 550,000 new cases occur annually.

The prevalence of congestive cardiac failure in India is 18.8 million (1.76% of population) and the incidence is 1.57 million per year (0.15% of population). CVD may increase from about 2.9 crore in 2000 to as many as 6.4 crore in 2015 (National Commission on Macroeconomics and Health, India, 2006).
Cardiovascular disease in India has quadrupled in the last 40 years and World Health Organization (WHO) estimates that by 2020 close to 60 percent of cardiac patients worldwide will be Indians. Cardiovascular diseases alone account for one-quarter of all the deaths in low mortality low-income countries. This proportion is set to rise as these countries gain access to diets richer in fats and calories. In absolute terms, non-communicable diseases now kill greater number of people in the lower-income countries than in the high income countries.

In many developing countries, hypertension and ischemic heart diseases have become common problems. CVD is now more prevalent in India and China than in all economically developed countries in the world combined. For example, in India 32% of all the deaths in 2000 were due to CVD and the prevalence of hypertension and diabetes is increasing in South Asian countries (Ghaffar, A.2004).

The prevalence of coronary artery disease (CAD) in urban India is about double the rate in rural India and about 4-fold higher than the U.S. The rates appear to be higher in South India with Kerala having a prevalence of 13% in urban areas and 7% in rural areas. Prevalence rates in urban India are 7 – 10% in the north and 14% in the South and in rural India, 3% in the north and 7% in the South. Studies indicate that South Asians have elevated levels of low density lipoprotein (LDL) and triglycerides, while they also suffer from a deficiency in high density lipoprotein (HDL). In addition, South Asians tend to gain weight in the abdominal region (Waist: hip ratio >1.0 in men, >0.9 in women) and are at greater risk of heart disease.
The alarming statistics from India (World Health Day, 2002):

- Current projections suggest that by the year 2020 India will have the largest cardiovascular disease burden in the world.
- One fifth of the deaths in India are because of CAD. By the year 2020, it will account for one third of all the deaths.
- Heart disease in India occurs 10 to 15 years earlier than that in the west.
- It is estimated that there are about 45 million patients with CAD in India.

Cardiovascular disease includes dysfunctional conditions of the heart, arteries, and veins that supply oxygen to the vital organs. Heart failure is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. Heart failure can result from coronary artery disease, a culmination of long standing hypertension, from advanced cardiomyopathy or valvular dysfunction (Connolly, 2000). HF has been described as the end stage of cardiac disorders, with a poor prognosis than most cancers (Stewart, et al., 2001).

The major causes of cardiovascular disease are use of tobacco, physical inactivity, and a high cholesterol diet. Framingham studies have suggested that the obesity is a potential risk factor for the development of HF in men and women (Kenchaiah, S. et al., 2002). Physical inactivity increases all causes of mortality,
doubles the risk of cardiovascular disease, type II diabetes and obesity. Based on the population attributable risks, hypertension has the greatest impact on the development of HF, accounting for 39% of heart failure in men and 59% in women. Dyslipidemia characterized by a high total cholesterol / high density lipoprotein (HDL) ratio is also a risk factor for the development of HF.

The clinical manifestations of heart failure depend on a variety of factors, including the age of the patient, the extent and rate at which cardiac performance becomes impaired and the ventricle initially involved in the disease process. Left sided heart failure lead to symptoms of dyspnoea and fatigue. Other signs and symptoms include peripheral swelling, difficulty in sleeping in supine position, coughing, and the inability to perform normal activities of daily living and a sudden weight gain due to fluid retention. Light headedness, dizziness and palpitations are also common and can indicate cardiac cachexia (Connolly, 2000).

The cardinal manifestations of heart failure are dyspnoea, poor exercise tolerance and fluid retention and these may lead to pulmonary congestion and peripheral edema. Both abnormalities can impair the functional capacity and quality of life of affected individuals; however, they do not necessarily dominate the clinical picture concurrently (Givertz, M. et al., 2005).

Chronic illness places a tremendous burden on the individual, the family and on society. HF is one of the most devastating of all the chronic disorders due to the unpredictable daily fluctuations in functional capacity and the threat of death. In chronic diseases, the cost of care is spread over many years instead of being concentrated at the onset of treatment.
Heart failure management includes symptom relief, improvement in quality of life and prevention of further heart failure progression (Riegel, 2000). The treatment also involves pharmacological intervention, risk factor reduction, dietary modification, exercise and education.

There is increasing interest in improving patient outcomes in the heart failure population. It is generally known and recognized that heart failure is common, costly and disabling with epidemic proportions. Treatment of patients with heart failure is aimed at both improving the survival and quality of life. The management of heart failure often includes several components with different objectives, for eg; enhancing treatment compliance, modification of risk factors and increasing social support. The goal of cardiac rehabilitation is to incorporate patients with heart disease into their physical and social activities that allow them to lead a normal life "as good as possible". Cardiac rehabilitation (CR) is a well-established treatment for patients with CAD. Meta-analysis of pooled data from clinical trials and cohort studies demonstrated significant reductions in all-cause and cardiovascular mortality in patients enrolled in exercise-based cardiac rehabilitation programs. (Joliffe, J.A., & Rees, K. 2001).

Over the past few years, studies have shown that supportive management interventions can improve patients’ quality of life and lifespan. Nurses are closely involved in caring a patient with heart failure and have developed ways of improving their quality of life. The health education needs are extensive and as with chronic disease, they need advice and support from nurses.
It is generally recognized that patients with heart failure have to learn to live with the consequences of disease and treatment, which means compliance with a regimen that includes medication, diet, exercise, monitor symptoms and seek assistance when symptoms occur. It is believed that an improvement in outcome depends on patients’ abilities to care for them and manage their consequences. Patients’ self-care abilities are often far from optimal (Carlson, B. et al., 2001), therefore, heart failure management programme aims at improving patients’ self-care, self-management and teaching them to recognize deterioration and take relevant actions in case of exacerbation.

Vinson, et al., (1990) reported that 27% of patients hospitalized for heart failure were rehospitalized within 90 days and a majority of these hospitalizations resulted from medication or dietary noncompliance. It has been proved that, up to 50% of the hospital readmissions might have been prevented if patients had performed self-care and complied with treatment and discharge planning.

Prolonged rest or inactivity can lead to skeletal muscle atrophy, further reduction in exercise tolerance, venous thrombosis, pulmonary embolism and exacerbation of symptoms. Bed rest is no longer prescribed, and in fact, an exercise regimen can increase functional capacity in patients with HF. Symptoms, resting cardiac function and quality of life improve by exercise.

Walking is the most common aerobic training modality utilized in cardiac rehabilitation programs. Physical exercise is associated with increase in heart rate, venous return, cardiac output, stroke volume and systolic pressure. Exercise capacity is determined by many factors such as body position, gender, age, body
mass, level of exercise training and environmental factors such as temperature and humidity. Weinberger, & Kenny. (2000) also note the importance of ensuring that the patient maintains an appropriate level of Activities of Daily Living, which will ultimately decrease oxygen demand and increase exercise tolerance.

The nurse plays an important role since she/he is the mentor in cardiac rehabilitation program. After having a cardiac event, the patient can participate in cardiac rehabilitation. The nurse, involves in the patient's family in the early rehabilitation stages, considers cultural variations and provides optimal care to the patient, helping him or her to lead a healthy and productive life. Participation in the cardiac rehabilitation program maximizes their ability to regain independence and provides the knowledge to ensure healthy living and that becomes a permanent part of their future.

Nursing interventions such as patient education on disease condition, treatment modalities, home care management, adherence to cardiac rehabilitation and the importance of follow up have demonstrated benefits in patients with chronic heart failure. Todd, M., Koelling, (2005) found that the addition of an hour of nurse educator-delivered teaching session at the time of hospital discharge resulted in improved clinical outcomes, increased self care measure adherence and reduced cost of care in patients with systolic heart failure.

Heart failure Society of America and the American Heart Association agree that patient education is an important element in the care of patients with heart failure; no specific recommendations are given with regard to the amount or content of information necessary to be effective. Beattie, (2000) reinforced the
importance of patient education, recognition of early signs and symptoms and the need for seeking attention to a weight gain of 2-3 Kg in a week, changes seen in the activity tolerance, onset of an acute illness, paroxysmal nocturnal dyspnoea (PND) or orthopnea.

Hallmarks of chronic heart failure are exercise intolerance, poor prognosis and poor quality of life. Compared with other chronic diseases quality of life has been demonstrated to deteriorate much more seriously in patients with chronic heart failure. The concept of quality of life (QOL) is considered to be increasingly important in the assessment of health outcomes. In studies of quality of life among patients with HF, patients commonly report psychological distress, including depression, hostility, anxiety, limitation in their activities of daily living (ADL), disruption of work roles, social interaction with friends and family, reduced sexual activity and satisfaction (Grady, 1993).

In recent years, measurement and improvement of quality has become an important focus for cardiovascular researchers due to a combination of factors including advances in measurement of quality and changes in the health care environment.

1.1 NEED FOR THE STUDY

Heart failure ranks as one of the leading chronic disorders affecting health-related quality of life (HRQL). Heart failure patients suffer from chronic, disabling conditions and treatment involving complicated drug regimens that require close monitoring and lifestyle changes. Nurses have identified and raised awareness
about this condition and continue to influence the quality of care. The key actions for HF patient care are to provide comprehensive, cost effective services and cardiac rehabilitation.

The past two decades have witnessed dramatic advances in the treatment of chronic heart failure with the development of novel therapies that have significantly improved the survival of large populations. In the Framingham study, the median survival was 1.7 years for men and 3.2 years for women, with only 25% of men and 38% of women surviving five years (Kannel, W.B. et al., 2000).

Severe symptoms, such as dyspnoea or edema and increased exercise intolerance affect important aspects of a person’s life. In addition, patients often have to adjust their lifestyle by adhering to a complex medication regimen, changing their diet and fluid intake, adopting their activities, and monitoring symptoms of worsening heart failure. To make these adjustments and to care for themselves effectively, patients need particular knowledge and skills.

Patients suffering from congestive cardiac failure exhibit impaired myocardial energy production, myocyte calcium overload and increased oxidative stress. Nutritional factors known to be important for myocardial energy production, calcium homeostasis and the reduction of oxidative stress, such as thiamine, riboflavin, pyridoxine, L-carnitine, coenzyme Q10, creatine and taurine are reduced in this population. It is our belief that these conditioned nutritional requirements, if unsatisfied, contribute to myocyte dysfunction and loss; thus, restoration of nutritional deficiencies should be part of the overall therapeutic strategy for patients with congestive cardiac failure (Allard, M.L., Jeejeebhoy,
K.N., et al., 2006). Low sodium diet, low cholesterol diet and low fluid intake helps the heart to work at its best.

Cardiac rehabilitation is a comprehensive exercise, education, and behavioral modification program designed to improve the physical and emotional condition of patients with heart disease. Cardiac rehabilitation (CR) is a treatment which aims to help the cardiac patient to recover from a cardiac illness as quickly and completely as possible and then reduce to a minimum the chances of recurrence (WHO 2006).

Cardiac rehabilitation is a well-established treatment for patients with CAD. Cardiac rehabilitation has also been associated with an improvement in heart rate recovery in patients with heart failure, coronary artery bypass grafts (CABG), or myocardial infarction. The goal of health care is to maximize activities of daily living and to achieve high level of QOL. The overall aims of CR are to improve function, relieve symptoms, and enhance the patient's quality of life.

Exercise for patients with stable HF has recently been endorsed as a treatment modality. Patients with congestive cardiac failure (CCF) experience a chronic and life-threatening disease trajectory, which is characterized by severe fatigue and dyspnoea, deteriorating functional status, episodic adverse cardiac events and repeated hospital readmissions. The negative impact of these ramifications on CCF patients has led to an increasing recognition of the importance of health-related quality of life (HRQL).
A combined educational and behavioural intervention program resulted in smoking cessation among 17% to 26% of patients who smoke (DeBusk, R.F., Miller, N.H., et al., 1994). Most traditional cardiac rehabilitation programs offer education and other interventions (e.g., stress management) that help with smoking cessation and relapse prevention.

Cardiac rehabilitation program can provide frequent measurements of blood pressure and promote appropriate lifestyle changes that may lessen resting and exercise blood pressure levels. Such lifestyle changes include weight reduction, increased physical activity, reduced dietary sodium levels, low cholesterol diet, fluid restriction, smoking cessation, moderate alcohol consumption and regular follow up. If drug treatment is required, then further information should be provided concerning the purpose of recommended drugs, their potential side effects and strategies to improve adherence.

The nurses are in an ideal position to focus on the clinical needs, educational and supportive needs of the patients and their family (Dahl, and Penque, 2000). Nurses can educate the patients in these aspects through structured teaching and encourage them to participate in the cardiac rehabilitation thereby prevent further complications of heart failure.

Educating patients about heart failure treatment and the consequences of heart failure has improved self-management behavior. For patients with heart failure, self-management plan includes monitoring of symptoms such as, fatigue, shortness of breath (SOB), daily weighing, knowing what to do if signs of deterioration appear and when to report the changes to the health care provider.
Cardiac rehabilitation promotes self-management by intensive education and periodic follow-up and it has improved the patients functional status and quality of life.

Nurse-guided education has improved self-care behaviour of patients with heart failure in several aspects; weight monitoring, medication compliance, fluid and salt restriction, regular exercise, smoking cessation and lifestyle modification and their importance. The follow up care has increased their knowledge and understanding of the disease condition and treatment. Apart from medication, diet and regular physical activity play an important role in secondary prevention of cardiovascular diseases (Kaleta, D., and Jegier, A. 2005).

Walking is the most common aerobic training modality utilized in cardiac rehabilitation (CR). Walking is the most common form of physical conditioning in exercise based CR. It is generally accepted that both objective and subjective dimensions must be included to adequately assess the impact of HF on the quality of life (Hadorn, D., and Baker, D., 1994). Since 6-minutes walk test (6MWT) is an objective measurement it has been suggested as a simple, safe, and inexpensive alternative to cardiopulmonary exercise testing. Increased exercise capacity leads to increased levels of everyday physical activity (PA) in a patient with CHF.

The nurse's multiple roles in cardiac rehabilitation is a 'spider in the web-like' character and, depending on the phase of the patient's recovery, he/she acts as a counsellor, a coach and an educator. To implement a successful nurse-led cardiac rehabilitation, the nurse needs to apply cognitive domain or critical thinking in clinical practice. The cardiac rehabilitation nurse should have a four-fold
comprehensive perspective of the cardiac rehabilitation concept; an impact perspective, a timing perspective, a lifespan perspective, and a personal perspective (Fridlund, B. 2002).

Patient education is a vital component of nursing care for this population, with the goals of improving the CCF patient's quality of life, minimizing symptoms and hospital admissions, and reducing length of hospital stay. A review of the literature related to the educational needs of CCF patients reveals minimal research. (Frattini, E., Lindsay, P., Kerr, E., et al 1998).

Targeted education and support is an important way to increase self-care behaviour in patients with heart failure and a recent study has shown that education and support is a vital component of heart failure management and can substantially reduce adverse clinical outcomes and health care costs (Krumholz, H.M. et al., 2002).

Most hospital admissions for heart failure result from lack of patient adherence to drug or dietary regimens, which suggest that disease management programs might improve both clinical outcomes and economic outcomes. An overview of randomized trials found that the hospitalizations were reduced and overall costs were generally lowered due to various disease management programs (McAlister, F.A. et al., 2004).

Teaching patients to enhance their self-care behaviour by education and support can influence lifestyle modification (for example diet, exercise), in response to worsening symptoms, and on coping with chronic illness. To enhance
the effectiveness, education should be tailored for each patient and their family. Support and education must be maintained as long as necessary in the home setting to cover the transition from hospital to home.

Participation in a CR program can promote recovery, enable patients to achieve and maintain better health, and reduce the risk of death in people who have heart disease. It has been shown that exercise-based CR can reduce fatal events by 25% in the first year and significantly reduce overall mortality from cardiac illness. More recent studies of psychosocial and education-based CR have shown even more impressive benefits in terms of mortality, morbidity, and quality of life.

Not only do the programs focus on enhancing recovery, they also focus on teaching ways of modifying risk factors (e.g., weight loss, cessation of smoking, stress management). Participation in these programs resulted in improved exercise capacity, lipid profile levels, ejection fraction, body weight, blood glucose, blood pressure levels, cessation of smoking, and reduction in anxiety and depression. Another benefit of CR is that it increases the functional independence of patients, as measured by a return to appropriate and satisfactory work. In terms of cost effectiveness, the additional benefit is reduced cost for subsequent hospital treatment.

Potential non-compliance with advice and failure to seek medical attention when symptoms occur are related to rehospitalization. Thus it can be expected that patients who are unable to care for them effectively will encounter certain problems leading to rehospitalization or unnecessary visits to the emergency department (ED). However, increasing the awareness about the disease and its
management will ensure the utilization of cardiac rehabilitation services in enhancing the quality of life.

Cardiac rehabilitation is designed to limit the risk of developing complications, help a person to return to an active social or work schedule, and improve the psychological well-being. It has four main components: medical evaluation, supervised exercise, lifestyle education and psychosocial support. Participation maximizes their ability to regain independence and provides adequate knowledge to ensure a healthy living.

Two systematic reviews to date have examined the interventions that may potentially improve cardiac patients uptake of, and adherence to rehabilitation or its components including exercise, education and lifestyle (Beswick, 2005). These reviews concluded that there have been sufficient qualitative studies to make specific recommendations on the methods to improve either the uptake or participation in cardiac rehabilitation.

HRQL has been recognized as an important clinical indicator, predicting the use of health services and mortality among CHF patients. Knowledge of the factors influencing HRQL in these patients will assist in the development of effective interventions to ameliorate the adverse impact of this illness. Quality of life reflects the way a person’s mental and physical well-being is evident in their day to day life. It is generally recognized that treatment of patients with CHF has only two main goals: to improve quality of life and functional ability.
In chronic medical conditions, minor changes in clinical status must be readily identifiable to monitor patients' progress and to modify treatment strategies. In heart failure, numerous clinical indicators have been employed to monitor patients' health status, including New York Heart Association (NYHA) functional classification of dyspnoea, exercise capacity (e.g., six-minute walk test), body mass index, and lipid profile. Self-reported health-related quality of life measures are increasingly being used to provide complementary and additional insight into the health status of a patient.

Thus, the investigator felt the importance of cardiac rehabilitation for patients with chronic heart failure through structured teaching program and was interested in evaluating their adherence and quality of life.

1.2 STATEMENT OF THE PROBLEM

“A study to assess the effectiveness of Nurse-Led Cardiac Rehabilitation on Adherence and Quality of Life among patients with Heart Failure admitted in cardiology wards at Sri Ramachandra Medical centre, Porur, Chennai.”

1.3 OBJECTIVES OF THE STUDY

The objectives of the study were to

1. Determine the effectiveness of nurse-led cardiac rehabilitation on adherence among the patients with heart failure.

2. Evaluate the effectiveness of nurse-led cardiac rehabilitation on quality of life among the patients with heart failure.
3. Identify the relationship of adherence to cardiac rehabilitation with quality of life among the patients with heart failure.

4. Associate the background variables with adherence to cardiac rehabilitation and quality of life among the patients with heart failure.

1.4 OPERATIONAL DEFINITIONS

1. **Effectiveness**

   The degree to which nurse-led cardiac rehabilitation has produced the beneficial result in terms of adherence to cardiac rehabilitation and health related quality of life.

2. **Nurse-led cardiac rehabilitation**

   The structured teaching program of education and activity guided towards lifestyle modification, increases the functional capabilities of patients with heart failure, which includes knowledge on disease, diet pattern, exercise regimen, importance of regular medications, smoking cessation and follow up care.

3. **Adherence**

   The extent to which the patients with heart failure continue to comply with the aspects such as, salt restricted diet, fluid management, regular exercise, daily weighing, taking medications, smoking cessation, follow up care and lifestyle changes.
4. **Quality of life**

The overall well being and ability of patients with heart failure to lead normal life, activities in areas of health, daily activities, occupational and social activities.

5. **Heart failure**

Heart failure is a complex clinical syndrome that can result from any structural or functional cardiac disorders, includes those patients admitted with coronary artery disease, dilated cardiomyopathy and hypertensive heart disease.

1.5 **HYPOTHESES**

1. There is a significant change in the level of adherence to cardiac rehabilitation among the patients who participate in cardiac rehabilitation program than the patients who do not.

2. There is a significant change in the quality of life among the patients who participate in cardiac rehabilitation programme than the patients who do not.

1.6 **ASSUMPTIONS**

1. Participation in the cardiac rehabilitation programme enhances psychosocial well-being.

2. Adherence to the cardiac rehabilitation programme enhances quality of life.
3. Nurses play an important role in cardiac rehabilitation.

4. Patients comply with interventions such as fluid and salt restrictions.

5. Heart failure patients often have greater degrees of functional impairment.