

THE HUMAN HEART: STRESS AND EMOTIONS AT PLAY

ROCIO NARANJO

A Project
Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF COUNSELLING

**FACULTY OF EDUCATION
LETHBRIDGE, ALBERTA**

March, 2009

Dedication

This project is dedicated to my family. The road I traveled would have been much more difficult without their help, understanding, and support. A special dedication goes to my three sons who inspire me by pursuing their dreams.

Abstract

The purpose of this final project is first, to provide a broad understanding of cardiovascular disease as a dynamic condition that responds to the physical environment of the human body and to the psychosocial factors that surround the affected individual. This broad understanding includes a contemporary definition and a multidimensional view of health and illness. Secondly, the paper evaluates current cardiac rehabilitation models, discussing the need to reorient these programs to comprehensively treat patients. Finally, this project presents a rehabilitation program based on self-efficacy theory with the goal to implement this model to cardiac rehabilitation programs in Ecuador.

Acknowledgment

I would like to thank my husband Antonio, a medical doctor, who helped me not only with his wisdom, but also with his support and encouragement when I needed it. I also extend my gratitude to Dr. Ken J. Barabash and Dr. Cynthia Ramirez under whose guidance I received consistent help and encouragement.

Table of Contents

Dedication.....	iii
Abstract.....	iv
Acknowledgment.....	v
Table of Contents	vi
Chapter I	1
Introduction	1
Project Rationale	2
Project Overview	2
Procedures of the Project.....	3
Purpose of the Project.....	4
Structure of the Project.....	4
Operational Definitions	4
Chapter II.....	7
Literature Review	7
Introduction	7
Contemporary Definitions of Health	8
Models of health.	9
Determinants of Human Health.....	11
Biological determinants.....	11
Environmental determinants.....	12
Lifestyle, behaviours, and risk factors.....	12
Health-care organizations.....	13

Cardiovascular Disease	14
Incidence.....	14
Causes of Cardiovascular Disease.....	18
Cigarette smoking.....	19
Dyslipidemia.....	20
Hypertension.....	21
Lack of exercise and obesity.....	22
Age, gender, and ethnicity.....	22
Emotions.....	25
Stress.....	29
Educational level and socioeconomic status.....	31
Summary and Conclusion.....	32
Chapter III	34
Cardiac Rehabilitation Programs.....	34
Medical Cardiac Rehabilitation Programs.....	34
Holistic Cardiac Rehabilitation Programs	35
Nonpharmacological programs.....	37
Wellness programs.....	37
Self-management programs.....	38
Summary and Conclusion.....	39
Chapter IV	42
Self-Efficacy Theory	42
Theoretical Framework	42

Self-Efficacy Theory in Health Care	44
Chapter V	46
Concerns about the Current Cardiac Rehabilitation Model in Ecuador	46
Overview of the Ecuadorian Health-Care System.....	46
The Ecuadorian Need for a Broader Perspective.....	47
Chapter VI	48
Self-Management Cardiac Rehabilitation Program.....	48
Introduction	48
Purpose of the Program	48
Objectives of the SMCRP	48
Structure of SMCRP.....	49
Patient inclusion criteria.....	49
Referral criteria.....	49
The professional team.....	49
Method of the SMCRP	50
SMCRP Phase III	51
Introduction of Phase III.....	51
Purpose of Phase III.....	51
Objectives of Phase III	51
Structure of Phase III.....	52
Professional team.....	52
Materials.....	52
Method of Phase III	52

Duration.....	52
Content.....	52
Expected outcomes.....	52
SMCRP Training Guide for Counselling Cardiac Patients	53
Definition.....	53
Week 1: Introductory Session	53
Session rationale.....	53
Procedures.....	53
Week 2: Self-Monitoring.....	54
Session rationale.....	54
Procedures.....	54
Week 3: Orientation to Skill and Relaxation Training.....	56
Session rationale.....	56
Skills rationale.....	56
Exercise.....	57
Discussion.....	57
Practice of skills	57
Record of skill use	57
Week 4: Cognitive Restructuring and Positive Thinking.....	58
Session rationale.....	58
Skill rationale.....	58
Record of skill use	59
Week 5: Identify the Source of Stress/Stimulus Control.....	59

Session rationale	59
Skills rationale	60
Exercise.	61
Record of skills use.	62
Week 6: Mind and Body Link	62
Session rationale.....	63
Procedures.	63
Discussion.....	63
Week 7: Self-Efficacy	63
Session rationale.....	63
Skill rationale.....	64
Procedure.....	64
Discussion.....	64
Record.....	65
Week 8: Problem Solving and Decision Making	65
Session rationale.....	65
Skill rationale.....	65
Procedure.....	66
Exercise.	66
Record of skill used	66
SMCRP Outcomes.....	66
Smoking Cessation and Weight Management Programs	67
Self-Management Cardiac Rehabilitation Program Evaluation	67

Chapter VII.....	69
Conclusions	69
Suggestions for Future Projects.....	74
References	75
Appendices	92
Appendix A: Training Professional Health-Care Teams.....	92
Inclusion criteria.....	93
Appendix B: SMCRP Phase I and Phase II.....	96
Nutritional individual sessions	103
Exercise performance	103
Expected outcomes.....	104
Appendix C: SMCRP Evaluation.....	106

Chapter I

Introduction

The intent of this project is twofold: (a) to provide health care professionals with a broader understanding that the interrelationship between the body and mind influences an individual's health status specifically relating to cardiovascular diseases (CVD); and (b) to develop a holistic cardiac rehabilitation model applicable to Ecuador. Therefore, this chapter provides a brief introduction to the concept of body-mind interconnectivity and identifies the project rationale, purpose and importance.

The notion that the human mind plays a significant role in physical illness existed since the earliest days of medical science. From the time of the ancient Greeks to the beginning of the 20th century it was generally accepted that the human mind can affect the course of illness (McEwen & Norton, 2003). Over the last century, the development and expansion of body-mind research has greatly impacted the modern understanding of psychosocial and behavioural risk factors in health and illness (Damasio, 2002) and should change the way that health professionals perceive and treat diseases.

A variety of programs have emerged representing new directions in the management of CVD infusing this new perspective into their treatment options. These holistic programs (e.g., Lorig et al., 1999; Ornish et al., 1998; Sweeney & Witmer, 1991; Witmer & Sweeney, 1992) represent an alternative to the traditional, illness-based medical model, and have been recognized as successful interventions for the treatment of CVD.

Project Rationale

Heart disease is one of the most prevalent diseases in the world (National Heart, Lung, and Blood Institute, 2002). Despite the presence of remarkable interventions in preventive and curative fields, CVD continues to be the “number one killer” globally (Guarneri, 2006; Langille, 1999; World Health Organization [WHO], 2004). Researchers have demonstrated that CVD has negative physical and mental health implications for patients (Friedman, Klein, & Friedman, 1996). Therefore, in treating the consequences of this major illness, it has been suggested that physical and mental health practitioners work collaboratively (Friedman et al.). The lag between this suggestion and current CVD treatment options indicates that the medical community needs to incorporate this paradigm into their rehabilitation programs.

Project Overview

Initially, the author conducted a literature review to investigate the psychoneuroimmunological, biological, and psychological factors influencing individuals who have suffered from CVD. The literature review focused on examining contemporary definitions of health and illness, determinants of health and disease, health status causes and consequences, as well as outcomes of cardiac rehabilitation.

For the purpose of this project, CVD was considered a result of a complex interlinked chain in which no single cause can be identified as the main determinant. Based on the outcomes of selected programs developed in North America, a theoretical holistic model of treatment was designed to be adapted to the treatment of CVD patients in Ecuador.

Procedures of the Project

The historical perspective, discussion of the studies, and research reports were retrieved and reviewed using the research databases PsycINFO, OVID, and Medline. Specific search terms include “coronary heart disease,” “preventable illness,” “health and illness,” “emotions,” “organic immune,” “endocrine,” “nervous response,” “psychoneuroimmunology,” “cardiac rehabilitation,” “self-efficacy,” “quality of life,” and “lifestyle modification.” The results of this research led to the completion of an extensive cross-reference of the findings. The literature review considered contemporary research published since the year 2000. The author examined content of specific e-journals, including but not limited to *Psychosomatic Medicine*, *Health Psychology*, *Evidence-Based Cardiovascular Medicine*, *American Journal of Cardiology*, *Circulation*, *Journal of the American Medical Association*, *The Lancet*, *New England Journal of Medicine*, and the *Journal of Cardiovascular Nursing*.

The existing body of research that addresses CVD and cardiac rehabilitation provided a basis for the remainder of the literature review. For this reason, it was important to narrow the scope of existing resources to those considered more relevant for the final research project. Several factors played a role in the selection process for consideration and inclusion in the project. First, research that specifically focused on ischemic heart attacks was selected. Second, research that focused on broader geographic influence was preferred instead of results based exclusively on local populations. Third, prospective studies were selected because they included a broader spectrum of risk factors and the longitudinal nature of their observations. Fourth, research that highlighted the relationship of stress and emotions to the onset, development and treatment for heart

attack patients was chosen in order to understand the interconnectivity of psychobiological processes in coronary artery disease. Finally, studies and programs with a holistic approach to cardiac rehabilitation were selected because their theoretical framework encompasses the basis of this project.

Purpose of the Project

This project has two central purposes: (a) to provide a broader understanding of CVD, as well as its consequences and management; and (b) to develop a holistic model or treatment of CVD patients in Ecuador. It is important to mention that this final project did not include any human subject participants and, hence, no ethics review application was necessary.

Structure of the Project

First, a literature review focused on contemporary definitions of health, and determinants of human health will be presented in Chapter 2. Chapter 3 outlines cardiac rehabilitation programs including traditional, medical and holistic models. Chapter 4 presents self-efficacy theory framework and its current application in the treatment of chronic conditions. Chapter 5 introduces an overview of the Ecuadorian health care system, highlighting the need for a multidisciplinary approach to cardiac patients. Chapter 6 includes the development of self-management cardiac rehabilitation program proposed as a model to be implemented in Ecuador. Finally Chapter 7 outlines the limitations and directions for future research.

Operational Definitions

Behavioural medicine – an interdisciplinary field introduced in the early 1970 to study the relationships between behaviour and health.

Biopsychosocial model – the view that health and illness involve the interplay of biological, psychological and social factors in people’s lives.

Cardio vascular disease - refers to the class of diseases that involve the heart or blood vessels. The term technically refers to any disease that affects the cardiovascular system.

Dyslipidemia - is a disruption in the amount of lipids in the blood.

Health belief model – an explanation of people’s health-related behaviour based on their perception of the threat of illness or injury and the pros and cons of taking action.

Health psychology- a field of psychology introduced in the late 1970s to examine the causes of illnesses and to study ways to promote and maintain health, prevent and treat illness, and improves the health care system.

Hypertension – the condition of persistent high blood pressure.

Ischemic disease - a disease characterized by reduced blood supply to the heart muscle, usually due to coronary artery disease.

Medical model - the medical model is an approach to pathology that aims to find medical treatments for diagnosed symptoms and syndromes and treats the human body as a very complex mechanism.

Morbidity – the amount of people that become ill in a specific location and at a specific period of time in relation to the total population

Obesity - is a condition in which excess body fat has accumulated to an extent that health may be negatively affected.

Psychoneuroimmunology – a field of study focusing on relationships between psychosocial processes and nervous, endocrine, and immune system functioning.

Psychosomatic medicine – a field introduced in the 1930s to study the relationships between people's systems of illness and their emotions.

Self-efficacy – people's belief that they can succeed at something they want to do.

Secondary prevention – actions undertaken to identify or treat a health problem early with the aim of arresting or reversing the condition.

Sequelae – pathological condition resulting from a disease, injury, or other trauma.

Theory of planned behaviour – an explanation of people's health-related behaviour. Their behaviour depends on their intention, which is based on their attitudes regarding the behaviour and beliefs about the subjective norm and behavioural control.

Theory of reasoned action – a theory derived from the social psychology setting. It sustains that a person's voluntary behaviour is predicted by his/her attitude toward that behaviour and how he/she thinks other people would view them if they performed the behaviour. A person's attitude, combined with subjective norms, forms his/her behavioural intention.

Transtheoretical model of change – a theory of intentional behaviour that describes people's readiness to change with five potential stages: precontemplation, contemplation, preparation, action, and maintenance. In health psychology, it explains or predicts a person's success or failure in achieving a proposed behaviour change.

Chapter II

Literature Review

Introduction

The purpose of the following chapter is to provide a comprehensive overview of the research on CVD. It begins by examining the research literature pertinent to the evolution of physical health and illness definitions and the impact of these definitions on the conceptualization of health problems, treatment, and measures of prevention. This review includes several elements including: a) models of health; b) determinants of human health; c) incidence of CVD; and d) causes of CVD. The most representative statistical reports are presented in order to broaden the understanding of the causes for the high incidence of this disease.

Currently, it is recognized that despite the preventive efforts of North American and other developed countries, chronic diseases such as CVD remain causes for concern because of their high rate of incidence, mortality and disability (American Heart Association [AHA], 2004). Although circulatory disorders have considerably decreased over the last 20 years in developed countries (Massé & Gilbert, 2003), CVD is still responsible for slightly more than a third of deaths worldwide (AHA, 2004). At present, the health-care community acknowledges that emotional stress plays an important role in nearly all illnesses, both directly and indirectly. In addition, the innovative research of psychoneuroimmunology (PIN) has revealed that the body, mind and spirit are not fragmented, and encourages the thought that the human heart is more than a physical pump (Guarneri, 2006). Therefore, the synthesis of this literature review will be the

theoretical base to sustain the holistic model of treatment for CVD that is the second purpose of this project.

Contemporary Definitions of Health

“Health is multidimensional and not merely the presence or absence of disease. Health has social, psychological and cultural determinants and consequences,” (Shah, 1998, p. 1). In 1948, the World Health Organization (WHO) was the first body to acknowledge health as multidimensional in nature, defining it as “a complete state of physical, mental and social well-being and not merely the absence of disease, or infirmity” (2001, p. 10). This broad definition can be applied equally to developed and developing countries and to both genders (WHO, 2001). Lately, the WHO has developed a new definition of health that recognizes the interdependence between an individual and his or her environment. This socioecological definition considers health as “the ability to identify and to realize aspirations to satisfy needs, and to change or cope with the environment” (WHO, 2005, p. 18). Health is, therefore, a “cumulative state to be promoted throughout life and the source of everyday life, not the objective of living” (WHO, 2005, p. 20). Under this definition, health is a positive concept, which emphasizes social and personal resources, as well as physical capacities (Canadian Public Health Association, 1986; WHO, 2005). Therefore, health is more than biological; it involves psychosocial and biophysical dimensions. Accordingly, illness refers to the “individual’s experience or subjective perception of lack of physical or mental well-being and consequent inability to function normally in social roles” (Shah, 1998, p. 2).

The above definitions of health and illness challenges the biomedical conception that assumes “that disease is an affliction of the body and is separate from psychological

and social processes of the mind” (Shah, 1998, p. 4), a viewpoint widely accepted during the 19th and 20th centuries and the dominant viewpoint in medicine today (Friedman et al., 1996).

The idea that body and mind are connected has a long history. René Descartes (as cited in Sarafino, 2006) in the 17th century introduced three important innovations. First, he conceived of the body as a machine that worked through mechanisms of action and sensation. Second, he proposed that mind and body, though separate entities, could communicate through the pineal gland. Third, he believed that the human soul leaves the body at death. At the beginning of the 20th century, Sigmund Freud (1923) observed that some patients showed symptoms of physical illness without an organic disorder and proposed that these symptoms were converted from unconscious emotional conflicts. More recently, some researchers have found evidence linking personality traits and health (Smith & Gallo, 2001), as in the case of people whose personalities include levels of anxiety, depression, anger, hostility, or pessimism and thus appear to be more at risk of developing heart disease (Sarafino). Additionally, researchers have discovered that sick people tend to experience feelings of anxiety, depression, anger, or hostility, thus showing that emotions and illness influence each other (Orth-Gomér, 2007b). In this way, biological (inherited characteristics), psychological (cognition, emotion, and motivation), and social (culture, community) factors become important in the understanding of the “whole person” (Hayman, & Hughes, 2006, p. 154) and the interplay between health and illness.

Models of health. The predominant biomedical model during the 20th century viewed illness as the result of an individual’s exposure to a specific pathogen (Brannon &

Feist, 2004). Despite the major role of this biomedical model and the enormous medical progress achieved during the past few decades, patients were considered passive recipients of the medical information rather than active agents in their own treatment and recovery (Sarafino, 2006).

A relatively new perspective called the *biopsychosocial model* emerged as a framework to broaden the biomedical model and to promote the understanding of how psychological, social, and biological factors affect and are affected by a person's health (Sarafino, 2006). In fact, the biopsychosocial model accompanied a dramatic shift in focus from disease to health, recognizing that psychosocial factors such as beliefs, relationships, stress, ethnicity, race, gender, spirituality, and so on greatly affect the onset, the progression, and the recovery from illness. In addition, this framework broadened the understanding of well-being, opening the spectrum of treatments and, perhaps more importantly, assisting in the availability of preventative measures (Shah, 1998).

Current holistic approaches to health care contributed to a new way of understanding physical health and disease patterns. This understanding triggered the development of hybrid and interdisciplinary approaches such as health psychology, behavioural medicine, psychosomatic medicine, and PIN as strong and prolific fields concerned with issues of physical health (Brannon & Feist, 2004). Suddenly, knowledge of patient behaviour became essential to promote health and treat disease. Patients' cognitions, beliefs, attitudes, motivations, perceptions, personal control, perceived risks, intentions, social norms, and self-efficacy became important components that contributed to shape patients' health conduct (Brannon & Feist).

In the attempt to predict and to understand patients' behaviours, researchers formulated various theories such as the health belief model, theory of reasoned action, theory of planned behaviour (an expanded version of the theory of reasoned action), and stages of change model (Sarafino, 2006). In addition, several theoretical models of behaviour were applied to health behaviour in order to understand the problem of patients' adherence or nonadherence to medical advice (Brannon & Feist, 2004). These models included the behavioural model, the self-efficacy theory, and the transtheoretical model. All of the aforementioned theories have produced a substantial amount of research in this field. However, the need for more accurate explanations to understand and predict safe and unsafe health-related behaviours still exists (Brannon & Feist).

Determinants of Human Health

In general, human health determinants have four broad categories: (a) biological; (b) environmental; (c) lifestyle, behaviours, and risk factors; and (d) health-care organizations (Crichton, Hsu, & Tsang, 2000; Lalonde, 1974; Sarafino, 2006; Shah, 1998).

Biological determinants. Biological determinants include those aspects of health that are determined by the organic structure and physiological functioning of the human body (Shah, 1998). They encompass genetic factors that can result in the development of inherited disorders and the predisposition to develop diseases. In addition, biological determinants include changes due to the processes of development, maturation, and aging that can affect the efficient, effective, and healthy functioning of the physical body system (Lalonde, 1974).

Environmental determinants. Environmental factors encompass determinants that are external to the human body or those over which humans have little or no control (Shah, 1998). Some examples of environmental factors are pollution, air, water, noise, environmental sanitation, food safety, technological innovation, communicable diseases, and the rapid change of social environment.

Currently, the environment, as a determinant of health, includes the psychosocial environment, which embraces education, geographical location, income, social support, nutrition, bereavement, social mobility, migration, cultural change, gender, race, ethnic origin, stressful life events, and individual social circumstances (Lalonde, 1974). Additional socioeconomic variables also have been identified as predictors of health. For instance, there is persuasive evidence of the inverse relationship between socioeconomic class and incidence of preventable disease (Blair, Cheng, & Holder, 2001). There are a number of explanations to account for the inverse relationship between SES and health. Some researchers have suggested that this inverse relationship may be the result of material deprivation or the lack of adequate financial support or other resources to maintain physical and psychological well-being (Shah, 1998). Other theorists (e.g., Orth-Gomér, 2007b) have argued that consumption patterns related to SES are associated with the onset and development of illnesses.

Lifestyle, behaviours, and risk factors. Other determinants such as lifestyle and other behavioural risk factors involve aspects of individual behaviour and surroundings over which a person has some level of control (Sarafino, 2006). These factors might include personal decisions regarding habits that can produce either favorable or adverse consequences for health. Alcohol, tobacco, and drug consumption, abuse of

pharmaceuticals, diet, lack of physical activity, sleep patterns, unsafe sexual practices, as well as the level of risk individuals take in these activities are also associated with significant health problems (Orth-Gomér, 2007b; Public Health Agency of Canada, 2004; Shah, 1998).

Health-care organizations. Health-care organizations, such as medical clinics, hospitals, chronic-care facilities, and other ancillary services, are usually defined as critical components of the health-care system (Shah, 1998). The health care system is primarily regarded as a means to alleviate or remediate health problems based on a biomedical model (Shah). Other health organizations may also incorporate alternative health-care modalities such as meditation, stress reduction, biofeedback, and acupuncture. Although critics of alternative health practices assert that there is no scientifically demonstrated proof of its efficacy, many individuals use these health-care practices (Crichton et al., 2000; Vogel et al., 2005).

Even though most health professionals still tend to construct the human body as a biological machine, other determinants are now considered underlying causes of health and illness (Sarafino, 2006). These determinants highlight the interdependence between an individual's health status and their social networks, culture, beliefs, life style choices, and state of mind (Sarafino, 2006). Lalonde (1974) was the first to incorporate a health model that included social support networks, personal health practices, coping skills, and healthy childhood development. Another framework includes the spiritual dimension as important step in the process of healing that involves all aspects of the human being (Sarafino, 2006). But even though these elements are readily known, they are slow to be incorporated into overall patient treatment and illness prevention.

Cardiovascular Disease

Incidence. Even though CVD has been found to be a preventable condition (Kirkland et al., 1999), it is a major killer and the cause of extended hospital stays worldwide (American Heart Disease and Stroke Statistics [AHDSS], 2005).

Unfortunately, incidence of CVD is projected to rise over the next few years (AHDSS, 2005).

In 1990, CVD accounted for 22% of deaths in developing countries, and is responsible for 10% of daily economic loss in low to middle-income countries and 18% in high-income countries (AHDSS, 2005). The countries with the highest death rates from heart disease are Russia, Romania, Poland, Bulgaria, and Hungary, while those with the lowest rate of CVD mortality include Japan, France, Spain, Switzerland, and Canada (Rosamond et al., 2007). By 2020, it is predicted that CVD will cause 34% of all deaths in these developed countries. Data from the Agency for Healthcare Research and Quality (AHRQ) shows that 11.6% (12.9 million) of women and 11.4% (11.7 million) of men aged 18 years and older reported being told by a doctor that they have CVD, including coronary disease, congestive heart failure, myocardial infarct, and stroke (Rosamond et al.). Although these largely preventable conditions are more common among people aged 65 years or older, the number of sudden deaths from heart disease among people aged 15–34 years has increased (AHDSS, 2005).

In the United States, CVD ranks as the number one killer and the major cause of permanent disability, accounting for 19% of all disability payments by the Social Security Administration (Pegus, Bazzarre, Brown, & Menzin, 2002). CVD claims the lives of over 36% of the more than 2.4 million Americans who die each year. More than

79 million Americans currently live with CVD. Estimates are that about 37.2% of non-Hispanic white men and 35% of non-Hispanic white women have CVD (AHDSS). Among African-Americans, 44.6% of men and 49% of women have CVD, and among Mexican-Americans, 31.6% of men and 34.4% of women have CVD (Rosamond et al.). Statistically, every 20 seconds one person in the US has a heart attack, and every 33 seconds a person dies from this condition (AHDSS). Moreover, at least 250,000 people die of heart attacks per annum before they reach a hospital. An estimated 72 million people aged 20 years or older have high blood pressure and 105.2 million people have blood cholesterol levels, both risk factors for CVD (AHDSS).

The magnitude of treating this disease is immense, the total cost for CVD-related medical care and disability in the US was projected to be \$431.8 billion in the year 2007 (AHDSS, 2005). The American Heart Association (AHA) alone spent approximately \$544 million in 2005 on research support, professional and public education, and community service programs (AHDSS).

In England, one out of every three people dies from CVD every year (Allender, Peto, Scarborough, Boxer, & Rayner, 2007). By itself, CVD is the most common cause of death in the UK and the main cause of premature death among the UK population (Allender et al.)

In Canada, as in other developed countries, CVD is the leading cause of death, premature death, morbidity, and years of potential life lost (Langille, 1999). CVD resulted in an estimated 294,000 years of life lost in 1995, occupying the third position after injuries and cancer (Statistics Canada, 2007a). The various health conditions that accompany this disease and the associated sequelae are the leading causes of disability,

loss of productivity, and deterioration in quality of life among Canadian men and women (Langille). In 1994, 56,960 people died from CVD, comprising 27.5% of the total deaths in Canada that year. In 2002, 117 for each 100,000 deaths were a product of this condition. In 2004, 96 for each 100,000 deaths were attributed to CVD (Statistics Canada, 2007b). However, the rates of CVD have been falling substantially over the past two decades, declining as much as 50% in some subpopulations (Langille). The reasons for the declines in CVD rates in Canada are not clear. Some evidence suggests that CVD reduction is presumably the result of preventive efforts and improvement in medical care systems (Kirkland et al., 1999; MacLean, 1999). Despite the observed declines, CVD is still the leading cause of death and disability in Canada, as well as the leading cause of premature death. Currently, 8 out of 10 individuals have at least one of the risk factors for CVD, and 1 in 10 has three or more factors that contribute to the onset and development of the disease (Statistic Canada, 2007b).

It is estimated that CVD costs the Canadian health care system approximately CA \$17 billion annually, resulting in heavy social and economic costs for the country (Kirkland et al., 1999; MacLean, 1999). CVD is the largest contributor to both direct and indirect health costs in Canada (Statistics Canada, 2007a).

Perhaps one of the most important factors to consider is that the baby-boom generation is entering the years when chronic diseases are expected to develop. As the median population age increases, heart disease and stroke will probably increase in the following years (MacLean, 1999), raising the overall cost of health care dramatically. By the year 2016, it is anticipated that the proportion of the population older than 65 years of age will increase from its current level of 12% to 16% (Kirkland et al., 1999; MacLean).

In South America, Ecuador is considered a developing country with an average life expectancy of 70 years. By 1995, it was estimated that the population of Ecuador had lost “more than one million years due to premature death and incapacity” (Lozada et al., 1996, p. 18). These lost years of potential life were attributed to non-transmitted diseases such as cardiovascular, cerebrovascular, and respiratory diseases. In addition, it was found that diabetes, one of the risk factors for CVD, was another prevalent health problem in Ecuador (Instituto Nacional Estadísticas y Censos [INEC] [Nacional Statistics Institute], 2005; Lozada et al.). Currently, CVD is the fifth largest cause of death in adult populations. Of key importance, however, is that the three major risk factors for CVD, cerebrovascular disease, hypertension, and diabetes, are also the top three causes of death in the country (INEC).

These statistical results confirm the findings of the prevalence of CVD in developing countries (Orth-Gomér, 2007b). In fact, statistics routinely collected of CVD mortality rates from most industrialized countries demonstrated increases in the 1950s and early 1960s. However, a decline started in the 1960s in the United States, Australia, Canada, Western Europe, and other developed countries (Paisa, 2006). It is estimated that one-third of the decline in mortality rates from CVD between 1973 and 1995 was the result of better medical treatment and two-thirds due to preventive strategies (Paisa). On the other hand, the disease increased in the developing world, since many people cannot afford coronary care and governments have competing requirements for health dollars (Kuulasmaa et al., 2000).

Causes of Cardiovascular Disease

In chronic degenerative disorders such as CVD, no single agent can be recognized as a main determinate. Even though the true causes are not fully known, a number of biological, social, and psychological risk factors have been identified (Kuulasmaa et al., 2000; Orth-Gomér, 2007b; Smith & Ruiz, 2002). Among them, the following have been branded as the most prevalent: smoking, diet, physical inactivity, obesity, cholesterol increases, stress, and type A personality (AHA, 1999). Other risk factors include chronic conditions such as atherosclerosis, diabetes, and high blood pressure (Kuulasmaa et al.). Socially, isolation and socioeconomic status (SES) are proposed factors in the development of CVD. The pathways by which SES contributes to the onset and development of CVD include lifestyle, behavioural patterns, ease of access to the health-care system, and chronic stress (WHO, 2004). Recently, several researchers have clearly stated that psychosocial factors increase cardiovascular risk independent of other risk factors (Hayman & Hughes, 2006; Orth-Gomér; Smith & Ruiz).

All of the aforementioned risk factors operate on a continuum with no definite threshold at play. However, the AHA (2004) emphasizes the need to search for other risk factors in individuals if one is identified. This procedure is recommended because coexisting risk factors multiply the risk of the disease (AHA). For example, in a controlled case study of 200 patients with first acute myocardial infarction in Bangalore, India, current tobacco smokers carried a greater chance for myocardial infarction. The probability tripled in diabetics who smoked and tripled again in people with hypertension (Paisa, 2006). Finally, it was found that more diseases and deaths occurred in people with

moderate elevations of two or more risk factors compared to those with a marked increase in a single factor (Paisa).

Many of the health decisions that patients make are rooted to their surrounding cultural influences and their individual lifestyle choices. These factors are not just medical issues that can be resolved by health-care professionals alone. This broader scope opens a space for a comprehensive and multidisciplinary approach to eliminate inequality in cardiovascular health. Moreover, it shows the imperative need for accelerating interventions in health promotion and disease prevention, evaluation, treatment, and control of CVD in populations with the highest risk factors.

Although there are many risk factors related to CVD, the description of each one of them goes beyond the scope of this study. Therefore, this paper limits its attention to smoking, dyslipidemia, hypertension, lack of exercise, obesity, gender, age, ethnicity, life stress, educational level, and SES.

Cigarette smoking. Cigarette smoking increases the probability of heart attack (WHO, 2003), and is the most important independent and preventable risk factor for men and women in developing CVD. It accounts for nearly 440,000 of the more than 2.4 million annual deaths in the United States (AHA, 2002) and substantially increases the risk of mortality from lung cancer, upper aero-digestive cancer, stroke, chronic respiratory disease, and a range of other medical problems (Sarafino, 2006). Today, there are about 1.3 billion smokers in the world (WHO), and despite the fact that the prevalence of adults and teen smokers has dropped steadily in industrialized countries, there is still a large increase in smoking in developing countries, especially among males

(Sarafino; WHO, 2004). Though, there is variation in smoking rates across cultures, ages, and genders, all cultures show a higher predominance in males (WHO).

Although it is well established that smoking is a major risk factor for CVD in middle-aged populations, it has been argued that the risk associated with smoking diminishes with age (Hayman & Hughes, 2006). It has been suggested that cigarette smoking produces a greater risk in persons less than 50 years of age, the group containing the vast majority of cigarette users, than in those older than 50. However, other researchers demonstrated that smoking over 64 years of age is associated with increases in ischemic heart disease and overall death from CVD (AHA, 2007), challenging this argument.

Dyslipidemia. Lipids are important energy sources and provide nutrients essential to health (Sarafino, 2006). These substances are directly absorbed from ingested food and produced by the body to store excess calories derived from carbohydrates, proteins, and alcohol (Beckie, 2006). Among all lipids, cholesterol has the greatest influence on heart disease and stroke. Cholesterol is a building block of cell membranes, and it is essential to the formation of vitamins and acids and the regulation of sex hormones (Pegus et al., 2002). Any excess of cholesterol and triglycerides in the blood may be deposited in the arteries in the form of plaque build-up, which narrows the arteries and hardens the walls, thereby reducing blood flow to the heart or blocking it completely (Horlick, 1994). For this reason, fat intake is a particular concern among people with elevated blood cholesterol (Steptoe, Doherty, Kerry, Rink, & Hilton, 2000). Studies have demonstrated that large reductions in serum cholesterol combined with dietary and drug treatment, retard and slowly reverse the artery damage and reduce the risk of heart attack (Sarafino).

It is important to consider that peoples' diets depend on their individual and social experiences, available food, and cultural and economic conditions (Sarafino, 2006). For example, studies in the United States have shown that fat intake is higher among people of low SES, but in the United Kingdom low SES is associated with the consumption of fiber, not fat (Steptoe et al., 2000). Some researchers (e.g., Orth-Gomér, 2007a; Steptoe et al.) found that education was not related to the magnitude of fat reduction. These findings might suggest that counselling in primary care may be equally applicable to individuals from a wide range of backgrounds, although particular efforts may be required to facilitate change in those with low educational levels (Orth-Gomér).

Hypertension. Blood pressure is the force applied by blood on the artery walls. It is different for all individuals and can change from one moment to the next. Blood pressure can be affected by environmental temperature, activity, and emotional experience (stress, anger, anxiety, and so forth) and is usually called the “silent killer” because it presents little to no symptoms until very serious (AHA, 2003).

Data from the National Health and Nutrition Examination Survey (NHANES) indicates that 50 million or more Americans have high blood pressure (American Heart Disease and Stroke Statistics [AHDSS], 2005). It is estimated that one billion individuals worldwide suffer from hypertension, and approximately 7.1 million deaths per year may be attributed to this disease (Chobanian et al., 2003). The WHO (2004) reported that high blood pressure is responsible for 62% of cerebrovascular disease and 49% of ischemic heart disease, with little variation by sex. According to recent estimates, almost one in three American adults has high blood pressure, but because there are no symptoms, nearly one-third are unaware that they have the disease (AHA, 2003). Numerous

researchers have clearly demonstrated the importance of lowering elevated blood pressure, showing that even modest reductions decreases the risk of stroke by approximately 38%, coronary heart disease by 16%, and cardiovascular death by 21% (Pegus et al., 2002; Weber, 2006). If the age-related rise in blood pressure can be prevented or reduced, there might be a corresponding decrease in CVD and stroke (AHA, 2004).

Lack of exercise and obesity. Exercise has often been identified as a key to increasing the quality of life and longevity of individuals. It has also been correlated with many aspects of human health, including mental health (Orth-Gomér, 2007a). In 1992, AHA concluded that physical inactivity and obesity were the major risk factors for heart disease (AHA, 2004). Data from longitudinal studies, such as the Multinational Monitoring of Trends and Determinants in Cardiovascular Disease (MONICA Project) and Cardiovascular Health Studies (Wannamethee, Shaper, Whincup, & Walker, 1999), indicated a positive association between heavier weight and lack of exercise with CVD in the general populations and specifically in those older than 65. According to these studies, moderately intense physical activity has important health benefits and has been proposed as a method for healthy aging. The importance of physical activity was emphasized in retaining functional abilities and promoting both psychological and cognitive functionality.

Age, gender, and ethnicity. Researchers have shown that multiple cardiac risk factors may not apply equally to all individuals because they are modified by age, gender, and ethnicity (Pearson et al., 2002). The Framingham study database (1990–1994) involving 5,127 people aged 30 to 62 demonstrated that the occurrence of CVD is

profoundly age dependent and that there are pronounced differences between men and women (Hughes & Hayman, 2007; Orth-Gomér, 2007a). Results from the National Center for Health Statistics (2001) show that for every 10-year increase in age, both men and women more than double their chances of dying from CVD (Brannon & Feist, 2004). This relationship may occur because CVD is linked to the development of atherosclerosis, an age-dependent health factor (Crichton et al., 2000). Additionally, the Framingham study and other studies such as MONICA (Tunstall-Pedoe et al., 1999) and the Seven Countries Study (Grundy et al., 1999) show that men develop CVD at a younger age than women. This discrepancy between men and women is strongest between the ages of 35 and 54, nearly doubling that of women. Nevertheless, these differences tend to disappear after 54 years of age, and the percentage of women's deaths due to CVD increases sharply, although it still does not equal that of men (Brannon & Feist). Moreover, other studies (e.g., Weber, 2006) have demonstrated that women tend to get CVD as frequently as men do but 10 years later on average due to estrogen hormone protection.

Although the influence of gender on CVD has been understudied, it has been found that once women have contracted CVD, their prognosis is worse than that of men, independent of age difference (Allen & Szanton, 2005). Weber (2006) found that women under 50 who had a heart attack were more than twice as likely to die from it. She also found that women tend to present more complicating conditions such as diabetes, hypertension, high cholesterol, and heart failure (Weber). This finding can be explained by gender differences in the degree of physical activity, leisure-time activities, and job-

related activities that might be conducive to higher rates of obesity in women (Brannon & Feist, 2004).

Concerning ethnicity, several studies show considerable variations in cardiovascular risk. In the Seven Countries Study, Grundy (1999) found that the population of Japan exhibited a much lower risk for CVD than other populations. In addition, this study demonstrated that Hawaiians of East Asian ancestry have only about two-thirds the absolute risk to present CVD. Moreover, it was found that African-Americans have nearly a two-fold risk for cardiovascular deaths compared to European-Americans (Grundy). In a well-integrated screening and evaluation for CVD risk that addressed racial and ethnic disparities among women across the United States (Well-Integrated Screening and Evaluation for Women Across the Nation [WISEWOMAN] project, 2000), investigators found that Native Alaskan participants were healthier in terms of CVD risk than white participants, having lower average blood pressure and total cholesterol. However, compared with white participants, black women had more obesity, higher blood pressure, and higher diabetes prevalence rates. The study concluded that some racial or ethnic disparities were explained by differences in individual and community characteristics, but other disparities persisted even after controlling for these factors. Ethnic differences as found in the United States, where African-Americans and Hispanics have been shown to have a higher risk for CVD compared to European-Americans, have been attributed to poor lifestyle behaviours such as physical inactivity, smoking, and alcohol consumption (Orth-Gomér, 2007a).

Other investigators found high incidences of CVD among South Asians (Indians and Pakistanis) living in Western countries (Kuulasmaa et al., 2000). This study revealed

that the South Asian population presents risk factors about twice that of Americans of European descent, even when the two populations are matched for major risk factors.

The WISEWOMAN projects suggested that low income, less educated, and uninsured women have increased risk of CVD morbidity and mortality (Finkelstein, Khavjou, Mobley, Haney, & Will, 2004). In addition, studies about migration found that lifestyle is more important than genetic factors in explaining variations in cardiovascular risk between different ethnic groups (Kuulasmaa et al., 2000).

Age, gender, and ethnic background cannot be modified. However, people with these risk factors are not necessarily destined to develop CVD. Individuals can minimize their overall risk profile by controlling their environment and other modifiable factors such as hypertension, smoking, exercise, and dietary habits.

Researchers have found that environmental factors such as economics, education, and community issues can aggravate the risk of developing CVD (Brannon & Feist, 2004). Studies have reported, for example, that both women and men with less than a high school education have nearly twice the rate of cardiovascular mortality as men and women with higher levels of education (Finkelstein et al., 2004). Therefore, the goal of intervention strategies is to reduce inherent risk factors systematically by modifying community variables that are associated with increased risk of developing heart disease.

Emotions. Many prospective studies have accumulated important data on the role that psychosocial and emotional factors play in the onset and development of CVD (Lawson et al., 2005). Several recent reviews (Gallo & Mathews, 2003; Suls & Bunde, 2005) have identified three affective dispositions (e.g., depression, anxiety, and anger-hostility) as putative risk factors for coronary heart disease. In fact, these findings suggest

that emotions of negative valence and positive arousal, such as those mentioned above, are related to an increase in CVD risk factors among healthy individuals (Gallo & Mathews; Glassman & Shapiro, 1998; Suls & Bunde). However, Suls and Bunde maintain that the overlap among the three negative dispositions leaves open the possibility that a general disposition toward negative affectivity may be more significant for disease risk than any specific negative effects. The results of other studies (e.g., Glassman & Shapiro) support these findings and others have added to these affective dispositions by including acute outbursts of anger, fear, sadness, and stressful events as emotions were linked to an increased risk of heart attack.

Currently, the most extensive support for connections between negative affective temperament and CVD comes from epidemiological studies, which consider CVD as an illness endpoint (Kemp et al., 2003; Suls & Bunde, 2005). Accordingly, researchers have concluded that depression, anxiety, isolation, and anger-hostility can predict CVD morbidity and mortality more accurately than traditional CVD risk factors because they affect how the individual experiences and interprets life events (Kemp et al.; Suls & Bunde).

One of the most impressive studies was presented by Weeke, Juel, and Vaeth (1988) using the Danish national registry between 1974 and 1978 to identify all individuals with a diagnosis of either major depression or manic-depressive disorder. These researchers followed 6,000 patients during an average of five years and found an excess of deaths from CVD among depressed patients. Moreover, Weeke and her associates examined all causes of natural death and found results similar to that of other

researchers, noting that there was a 50% increase in deaths from CVD among depressed patients when compared with the general Danish population.

In addition, a substantial number of studies have shown that depressive symptoms can predict a worse cardiac outcome for patients with existing CVD (Glassman & Shapiro, 1998). In fact, 9 out of 10 prospective medical studies documented an increased mortality rate from CVD among depressed patients. It was demonstrated that patients with depression in the period immediately after a myocardial infarction were 3.5 times more likely to die than patients who did not suffer from depression (Glassman & Shapiro). Sadly, just a few studies have examined the effect depressive symptoms on the incidence of CVD in populations initially depression-free (Glassman & Shapiro).

Although there is an awareness of the link between depression and heart disease, it is difficult to establish an exact cause-effect relationship for this connection. There are those who have theorized (e.g., Kemp et al., 2003; Suls & Bunde, 2005) that a depressed person is more likely to make bad lifestyle choices, including improper diet and drug and alcohol abuse, and to comply less with medical regimens. Those who favour a biological cause-effect explanation identify stress as a prime suspect, a frequent by-product of depression (Kemp et al.; Suls & Bunde). Accordingly, several other researchers (e.g., Friedman et al., 1996) have demonstrated that endogenous production of hormones is related with stressful episodes. It was found that cortisol production is increased in stressed individuals, bringing on erratic heartbeats (arrhythmias), increasingly elevated cholesterol, and stimulating the accumulation of abdominal fat (Friedman et al.). Therefore, as a consequence of psychological distress, the individual may experience

rapid heartbeat, high blood pressure, faster blood clotting, and elevated insulin levels (Friedman et al.).

The overproduction of insulin is the beginning of sequential metabolic processes that finally determine an increased risk for CVD. This process, described by Reaven as “metabolic syndrome” (Reaven & Chen, 1996, p. 1781), includes symptoms of hyperinsulinism, hypercortisolism, increases of serum catecholamines, hyperuricemia, high blood pressure, obesity, and diabetes. As high levels of stress hormones signal a “fight or flight” reaction, the body’s metabolism is diverted away from the type of tissue repair needed in heart disease (Friedman et al., 1996; Reaven & Chen).

In contrast, evidence supports that anxiety plays a strong role as a risk factor for cardiac disease. The influence of anxiety was found to be more consistent in initially healthy samples than in cardiac patient populations (Suls & Bunde, 2005). In fact, just a few studies found a significant risk of CVD progression due to anxiety in persons with known cardiac disease. However, these studies found difficulties in differentiating anxiety from medical conditions and in distinguishing anxiety symptoms from the normal, appropriate, and short-term fears a person might manifest after being hospitalized (Suls & Bunde).

Other recent evidence has suggested that there is a positive association between anger and hostility and the development of CVD (Brannon & Feist, 2004). These researchers have suggested that people who react with anger or are prone to anger and hostility are more likely to develop CVD due to the exacerbation of biological and physiological processes underlying cardiopathogenesis (Suls & Bunde, 2005). The biological mechanisms by which anger may increase the risk of CVD include discharge

of circulating catecholamines, increased myocardial oxygen demand, vasospasm, and increased platelet aggregability (Kawachi et al., 1996). Additionally, anger and hostility have been associated with increased activation of the sympathoadrenal (SNS) and hypothalamic-pituitary-adrenocortical (HPA) axis as physiological mechanisms (Friedman et al., 1996; Suls & Bunde). Finally, there is evidence of the association of hostility with less social support and more isolation (Smith & Frohm, 1985, as cited in Suls & Bunde). Hostile behaviour tends to promote unsatisfying interactions that may damage social support. As a result, hostile people may lack an important stress defence, specifically social support, thereby increasing their risk for CVD.

It is important to highlight that many studies about hostility and anger as risk factors for CVD were coupled with work on type A behaviour patterns (Sarafino, 2006). Primary studies from the early 1970s suggested that those who exhibit Type A behaviour patterns (e.g., driven, pressured, competitive, and aggressive individuals) react differently to stressors than do those with Type B patterns (e.g., low levels of competitiveness, time urgency, and hostility), who tend to be more easy going and philosophical about life (Sarafino).

Stress. Stress has been a focal point in PIN largely because of its demonstrated effects on bodily functions. After a prolific investigation, researchers have found that stress leads to illness by two routes: (a) a direct route that is the result from physiological changes produced by stress in the organism and (b) an indirect route that refers to changes in human behaviour due to the presence of stress (Sarafino, 2006). The physiological reaction begins with the perception of stress and the activation of the sympathetic division of the autonomic nervous system (ANS), which prepares the

organism for intense motor activity known as the “fight or flight” response (Brannon & Feist, 2004, p. 135). The activation of the sympathetic division compromises all parts of the organism through the production of epinephrine and nor-epinephrine, affecting the cardiovascular, digestive, and respiratory systems (Friedman et al., 1996). Symptoms such as an increase in the rate and strength of cardiac contraction, constriction of blood vessels in the skin, decrease of gastrointestinal activity, increase in respiration, stimulation of the sweat glands, and dilation of the pupils result from this activation process (Brannon & Feist; Friedman et al.). In addition, this physiological reaction can include the stimulation of the adrenal cortex to secrete glucocorticoids, including cortisol, which mobilizes the body’s energy resources, raising the level of blood sugar to provide energy for the cells (Brannon & Feist; Friedman et al.).

The indirect route through which stress is linked with disease refers to changes in health practices that increase the risk for disease such as increases in drinking, smoking, drug use, and sleep and alimentary disorders (Sarafino).

Further, it has been proposed that each individual’s response to stress depends on the extent to which each organism can cope with stress (Gallo & Matthews, 2003). The idea that some people react more strongly to stress than others is a possible link between stress and CVD (Brannon & Feist, 2004). Conversely, Lazarus’ proposition (1984) suggested that the effect of stress on a person is based more on precedents of the stressful event (i.e feelings of threat and vulnerability, the ability to cope, etc.) rather than the stressful event itself. This fact seems to explain the difference in response to stressful situations. In general, situations with high demands and an individual’s low sense of control tend to contribute to the development of illness or worsen existing health

conditions (Brannon & Feist; Sarafino, 2006). Additional sources of stress can also include family relationships, workplace demands, balancing multiple roles, and community conditions (Sarafino).

Educational level and socioeconomic status. Social and economic factors have been related to health and disease (Gallo & Matthews, 2003). Researchers (e.g., Gallo & Matthews; Yang et al., 2006) found that people educated at the undergraduate level and above are less likely to smoke and be overweight, are usually more physically active, and tend to have better eating habits than people with lower levels of education. On the other hand, individuals with lower educational levels have a higher prevalence of smoking, alcohol consumption, poor diet, stress, and exposure to toxins (Yang et al.).

From several studies about community conditions and environmental factors, psychosocial stress has emerged as the main explanation for how low SES can have repercussions on health. It has been postulated that people with lower SES are more likely to experience both chronic and acute stressors in their lives (Brannon & Feist, 2004). It was stated that low SES environments are stressful and reduce an individual's reserve capacity to manage stress, thereby increasing vulnerability to negative emotions and cognitions (Gallo & Mathews, 2003). Domestic violence, ending a relationship with a partner or with a child, custody battles, and being a member of a minority group appear to increase the stressors people experience (Sarafino, 2006). Despite the consistent pattern of these findings, the mechanisms that underlie the graded relationship between SES and health have not been clearly elucidated (Gallo & Matthews). In part, the influence of socioeconomic disparities in health can be explained by differences in the distribution of basic resources such as health care, nutrition, and sanitary living

environments (Gallo & Mathews). To corroborate these findings, studies of nonhuman primates have found that lower-status animals often show raised basal cortisol levels, lower levels of HDL cholesterol, more signs of coronary heart disease, and increased susceptibility to infection (Dowd & Goldman, 2006). Proponents of the idea that low SES harms health believe that this condition operates similarly in both humans and other primates (Dowd & Goldman).

Summary and Conclusion

The CVD risk factors presented above constitute direct targets for mental health therapies, either because they are major risk factors or because of circumstantial evidence of their role in the disease's onset and development. Even though other risk factors such as high blood pressure, high cholesterol, physical inactivity, diabetes, and family history of CVD were not discussed in detail in the present project, their exclusion should not be taken to imply that they are clinically unimportant. Their role in the evaluation and management of patients at risk deserves consideration. However, because the focus of this project is the development of a holistic model of intervention, the most important risk factors for this disease were considered.

This literature review included statistical measures to demonstrate the prevalence of risk factors of cardiac conditions in the general population. Even though data about heart disease risk factors is derived from various studies conducted predominantly in developed countries, studies of developing countries are also considered. The possible effects of CVD on emotions of negative valence and positive arousal such as depression, anxiety, and anger were likewise presented. The link between stress and CVD has considerable support (Brannon & Feist, 2004; Friedman et al., 1996). It has been stated

that the way a person reacts to internal and external demands depends on how that individual perceives the situation and on his or her biological, psychological, and social resources (Brannon & Feist). Situations that are perceived as threatening produce high arousal levels; generating physiological “fight-or-flight” reaction by which the organism is prepared to attack or flee (Friedman et al.). These series of psychological reactions can make the person vulnerable to diseases, including CVD. Psychosocial factors can play a role in eliciting an emotional response in individuals. Low educational levels and SES seem to influence disparities in health due to differences in the distribution of resources such as health care, nutrition, and sanitary living environments (Yang et al., 2006). In addition, people with lower SES are more likely to experience both chronic and acute stressors in their lives (Yang et al.).

Additionally, the literature suggests a complex relationship between stressful events and subsequent mental, physical health and disease outcomes. The biological and psychological risk factors explicated speak about the illusory boundaries of the biomedical sciences. Evidence demonstrates the integration of these two systems and the need of a conceptual and theoretical position that helps medical professionals understand psychosocial risk factors, emotional states, and physiological responses in the development and progression of disease, particularly CVD. This holistic conceptualization of human responses helps set new boundaries in the understanding of health and disease and in the treatment of chronic diseases such as CVD. The next chapter examines some existing cardiac rehabilitation programs.

Chapter III

Cardiac Rehabilitation Programs

This chapter further reviews the research literature surrounding CVD specifically relating to medical, holistic, and self-efficacy cardiac rehabilitation programs and the way these programs manage the treatment of cardiac patients.

Medical Cardiac Rehabilitation Programs

The Medical Cardiac Rehabilitation Program (MCRP) model, created more than two decades ago (Hughes & Hayman, 2007), was an innovation in cardiac patient management. Traditionally, post infarct patients have been treated very conservatively in the first period of their recovery (Hughes & Hayman), including suggestions for complete bed rest, limited amounts of physical exercise, and slow reintegration into normal life. Subsequent research in coronary management, however, has found that it was important to mobilize coronary patients as soon as possible after a cardiac episode (Lorig, Ritter, & González, 2003). These procedures were implemented in order to promote their recovery and decrease complications resulting from prolonged bed rest and inactivity, which increases the risk of pulmonary embolism and weaken the body's muscles (Lorig et al.) In addition, it was found essential to send patients home sooner to promote their fast recovery in a familiar environment. Based on these findings, various programs of cardiac rehabilitation were created with the objective to include early physical activity and to promote a quick return to normal life.

Usually, MCRP consists of a multidisciplinary approach to promote cardiovascular risk reduction, reduce disability, and encourage an active lifestyle change (Balady et al., 2000). This approach is a medically supervised model, which tries to

stabilize, slow, or even reverse the progression of CVD and prevent the risk of heart disease, another cardiac event, or even death (Balady et al.). MCRP is often divided into phases that involve various levels of monitored exercise, nutritional counselling, emotional support, and educational information about lifestyle modifications (AHA, 2000). It has been suggested that cardiac rehabilitation programs should begin while the client is still in the hospital and continue through a monitored plan in an outpatient setting until home-based maintenance can be safely followed (AHA, 2007). Usually, MCRP is tailored to individual needs and health conditions and lasts for approximately three to six months. Ideally, MCRP starts in the hospital and begins with simple exercises and self-care routines. Early-recovery cardiac patients gradually increase their activity level under the close supervision of the cardiac rehabilitation team. MCRP includes nutritional counselling, a stop-smoking program, and psychological counselling to help the patient in the development of skills for coping with environmental conditions, reassuming sexual activity, and finding social support (Balady et al., 2000). The ongoing recovery phase is a long-term maintenance program that will follow the patient for the rest of his or her life. Accordingly, the patient needs to develop and incorporate lifelong habits that include an exercise routine, nutritional changes, and emotional control. During this time, the patient is expected to return to an active lifestyle, with more motivation and improved quality of life (AACPR, 2004).

Holistic Cardiac Rehabilitation Programs

Since the 1990s, growing evidence from several areas of research has suggested that psychological factors are associated with increased risk of CVD (Kop, 2003). One major impact of these findings was the change in direction of cardiac rehabilitation

programs (Vogel et al., 2005), moving beyond the biomedical paradigm toward a more holistic philosophy of health (Friedman et al., 1996; Kop). Nonpharmacological treatments to manage stress, such as meditation, acupuncture, biofeedback, and music therapy, were found effective in decreasing risk factors for CVD (Vogel et al.). Currently, major medical schools and hospitals across North America and Europe and in developed countries worldwide are creating new models to treat mind, body, and spirit as elements that influence health and disease (Vogel et al.).

Several alternative programs are currently used as complements for pharmacological treatment. Stress reduction and management, meditation, group support, biofeedback, guided imagery, pet acquisition, and acupuncture are some of the techniques widely used with cardiac patients. Surprisingly, among all of these therapies, spirituality, faith, the will to live, and love for family and community were found significant in the outcomes in cardiovascular care (Vogel et al., 2005).

Despite the fact that clinical studies about the aforementioned therapies were consistent in suggesting their efficacy, there is no scientific evidence or specific recommendations for these interventions (Vogel et al., 2005). For this reason, the American College of Cardiology (ACC) and the AHA commissioned a Task Force on Clinical Experts to inform and guide health practitioners and patients about their efficacy. Additional clinical findings, guides, and suggestions about complementary, alternative, and integrative medical therapies were compiled in the manuals of *Complementary and Integrative Medicine* and *Complementary Medicine Expert Consensus Document* (Vogel et al.). The analysis of that document goes beyond the scope of this project. However, it warrants mentioning that the conclusions in that document illustrate that in the mind/body

relationship, the most common therapies used for coronary disease and for arrhythmias include stress reduction, group support, guided imagery, and meditation (Vogel et al., p. 201).

Most of the modern CRPs are offered in short-term residential forms or retreats and involve psychosocial interventions and complementary approaches. Different frameworks have promoted the development, testing, and evaluation of diverse holistic CRPs. Some examples of multimodal programs include: (a) Dr. Dean Ornish and colleagues' (1998) nonsurgical, nonpharmacological program for reversing heart disease; (b) the Wellness Evaluation of Lifestyle by Sweeney and Myers (as cited in Sweeney & Witmer, 1991), which is based on a holistic model of wellness and prevention over the life span; and (c) the self-efficacy programs developed by the Stanford Patient Education Research Center from the Stanford University School of Medicine (Lorig et al., 1999).

Nonpharmacological programs. Dean Ornish and his colleagues (1998) presented a randomized clinical trial to investigate whether ambulatory patients could be motivated to make and sustain comprehensive lifestyle changes and, if so, whether the progression of coronary atherosclerosis could be stopped or reversed by lowering the existing drug dosage or stopping pharmacological treatment outright. This program prescribes intensive lifestyle changes, including a low fat diet, moderate aerobic exercise, stress management training, smoking cessation, and group psychosocial support. Baseline comparisons between experimental and control groups have shown high levels of adherence to all aspects of the program during the first year (Ornish et al.).

Wellness programs. The focus of wellness programs is to promote lifestyle modifications to ensure optimal health and well-being, in which body, mind, and spirit

are integrated into a balanced and fulfilling lifestyle (Myers, Sweeney, & Witmer, 2000). Even though wellness programs cannot be considered specifically as CRPs, they are a viable option to manage health problems including CVD.

The model proposes that life tasks such as spirituality, work and leisure, friendship, love, and self-direction interact in a dynamic way with a variety of other life influences such as family, community, religion, education, media, business, and, finally, global concerns (Myers & Sweeney, 2005).

Self-management programs. Finally, the Stanford Patient Education Research Center (SPERC), part of the Department of Medicine at the Stanford University School of Medicine, developed, tested, and evaluated self-management programs for English and Spanish speakers dealing with chronic health problems (Lorig et al., 1999). SPERC programs were designed to help patients gain self-confidence in their ability to control their symptoms and to understand how their health problems affect their lives (Lorig et al., 2003). The purpose of these self-management programs is “to provide patients with the skills to live an active and meaningful life, despite their chronic conditions” (Lorig, 2003, p. 699). Among their numerous programs, some of the most commonly cited include the Arthritis Self-Management Program, the Chronic Disease Self-Management Program, Self-Management @ Stanford: Healthier Living With Ongoing Health Problems, the Positive Self-Management Program, the Back Pain Self-Management Program, and the Diabetes Self-Management Program. Other programs, such as Programa de Manejo Personal de la Artritis (Arthritis Self-Management Program), Tomando Control de su Salud (Chronic Disease Self-Management Program), Tomando

Control de su Diabetes (Diabetes Self-Management Program), were developed in Spanish and culturally adapted for the surrounding Latino community.

In general, self-management programs have become interventions used to promote healthful behaviours and to manage chronic conditions. They present three self-management tasks: (a) medical, (b) role, and (c) emotional management. The model includes six self-management skills: problem solving, decision making, resource utilization, patient-provider partnership, action planning, and self-tailoring (Lorig & Holman, 2003).

After one year of program exposure, control studies demonstrated significant improvements in the clients' health behaviour, self-efficacy, and health status. Control studies demonstrated evidence of their effectiveness, proposing self-efficacy as the mechanism through which these interventions worked (Blanchard et al., 2007; Lorig & Holman, 2003). Recently, chronic disease self-management programs were evaluated for nearly 1,000 subjects with heart disease, lung disease, stroke, and arthritis. These evaluations found that self-efficacy helps clients to develop confidence in their ability to adopt healthy behaviours that influence their health outcomes (Lorig et al., 1999).

Summary and Conclusion

Multimodal psychosocial programs and alternative therapies are currently used in addition to traditional methods to treat CVD. These therapies are gaining popularity among clients living with chronic diseases. Several CRPs offered across North America and Europe have demonstrated their efficacy in the management of cardiac clients (Kop, 2003). The most representative are offered in ambulatory and retreat forms and are accessible to patients and, in some cases, their families (Ornish et al., 1998). Other

programs with proven benefits are based on self-efficacy theory that enhances patients' confidence to manage their lives. Self-efficacy theory has been shown to be a common instrument through which psychosocial programs affect health outcomes (Lorig et al., 1999).

Due to the importance of the extensively tested therapies created by the SPERC, it was decided to use the Stanford self-efficacy scheme as the framework to develop a congruent and efficient model to be implemented as an alternative to cardiac rehabilitation programs in Ecuador. This decision was made after considering several factors, including the proven efficacy of these programs in the U.S. Hispanic community (Lorig et al., 2003), the positive experience in the management of patients with chronic diseases, the holistic approach of these programs, and these programs' foundation in self-management theory.

One of the frequent issues to be overcome in the development of health programs in Latin America is the fact that most of the experiences and information comes from North America. In order to be efficiently applied, such programs should be proven effective in a different culture (Lorig & Holman, 2003). Because the SPERC self-efficacy program was successful in the U.S. Hispanic population, it is possible to anticipate the success of a similar model in Ecuador.

Advances in the field of chronic care have demonstrated that models based on self-efficacy theory increase self-management behaviours, exercise, mental stress management, and treatment adherence (Joekes & Elderen, 2007; Marks, Allegrante, & Lorig, 2005). Self-efficacy models imply the transformation of health-care response from

a system that is essentially reactive to one that is proactive and focuses on keeping persons as healthy as possible (Lorig, 2003).

These findings have important implications for all cardiac rehabilitation programs, in which attention should be given to enhancing self-efficacy, self-management, program adherence, stress management, social support, and family overprotection diminishment. Observations based on the author's experience in a CRP in Quito, Ecuador demonstrated that the level of client adherence to self-care maintenance recommendations appeared to be a strong predictor of prescribed lifestyle changes, which determined the patient's quality of life.

Chapter IV

Self-Efficacy Theory

This chapter intends to conceptually explain the self-efficacy theory that serves as the basis for the SPERC series of self-management programs detailed and analyzed in this project.

Theoretical Framework

Albert Bandura (1997) proposed a social cognitive theory that supports the belief that individuals have some levels of control over their lives. Brannon and Feist (2004) credited him for his work on the interactions of human behaviour, environment, and personal factors, in which cognitive factors are considered especially important.

According to social cognitive theory, self-efficacy is defined as the belief that one individual can carry out specific behaviours in specified situations (Bandura, 1977). This theory holds that psychological procedures produce changes in behaviour and alter the level and strength of self-efficacy. It is hypothesized that expectations of personal efficacy “determine whether coping behaviour will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and aversive experiences” (Bandura, p. 191).

It has been sufficiently documented that cognitive processes play a prominent role in the acquisition and retention of new behaviour patterns. Of great importance in this process is the individual’s recognition that any two situations are correlated: It is the reinterpretation of a situation that favours the behaviour, rather than the stimuli themselves, that shifts the regulation of the behaviour from the stimulus to the individual (Bandura, 1977). This reinterpretation and reinforcement is important in the

understanding of human behaviour. Contrary to the belief that behaviour is controlled by its immediate consequences, it is proposed that “behaviour is related to its outcomes at the level of aggregate consequences rather than momentary effects” (Baum, 1973, as cited in Bandura, p. 192). Under this framework, outcome expectancy is defined as “a person’s estimation that a given behaviour will lead to certain outcomes,” and efficacy expectation is conceptualized “as the conviction that one can successfully execute the behaviour required to produce the outcome” (Bandura, p. 193).

Further, Bandura (1997) maintained that:

Outcomes and efficacy expectations are differentiated because individuals can believe that a particular course of actions will produce certain outcomes, but if they have serious doubts about whether they can perform the necessary activities; such information does not influence their behaviour. (p. 193)

That is, the expectation of personal mastery affects the individual’s coping behaviour. Additionally, it was stated that the level of people’s conviction in their own effectiveness affects the motivation and even the initiation of certain behaviours to deal with a given situation (Bandura, 1977). In this way, if individuals judge themselves as capable of dealing with a circumstance, this perception of self-efficacy will have a direct influence on their activities. Conversely, if people perceive that a certain situation exceeds their coping skills, they will probably tend to avoid it (Bandura). Consequently, Bandura concluded that “efficacy expectations of eventual success, will determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experience” (p. 194).

Bandura (1977) also proposed that individuals with higher levels of perceived self-efficacy tend to perform more effectively to achieve their desired objectives. Additionally, it was proposed that people who deal with a perceived threatening situation that in reality is relatively safe will gain corrective experiences that reinforce their sense of self-efficacy (Pegus et al., 2002). On the contrary, those individuals who cease their coping efforts very early in the process will retain their self-debilitating expectations and fears for an extended period of time (Bandura). However, Bandura also maintained that expectations are not the only determinants of behaviour, which highlights the need for individuals to learn appropriate skills to have adequate incentives.

Self-Efficacy Theory in Health Care

Self-efficacy is a psychological construct that describes the interaction between behavioural, personal, and environmental factors in health and chronic diseases (Sarkar, Ali, & Whooley, 2007). This construct extends beyond the psychological field and has been demonstrated to affect health behaviours and disease management in many chronic disease settings (Robertson & Keller, 1992; Sarkar et al.; Stix, 2003).

Findings from the Heart and Soul Study (Sarkar et al., 2007), which examined the relationship between cardiac self-efficacy and health status, including symptoms load, physical limitations, quality of life, and health among outpatients with stable coronary heart disease, further demonstrated that self-efficacy influences behavioural engagement. Likewise, it has been demonstrated that self-efficacy impacts the degree of expended effort, perseverance, resilience, and the level of achievement (Sarkar et al.; Stix, 2003; Sullivan et al., 1998).

An Australian study involving 115 volunteers from a major hospital tested the hypothesis that depression, anxiety, and self-efficacy are independent predictors of treatment adherence, concluding that self-efficacy strongly predicted adherence behaviour (Schweitzer, Head, & Dwyer, 2007). In the same way, other studies of self-efficacy in patients with CVD (e.g., Song, 2003) demonstrated that it plays a significant role in the successful rehabilitation of patients with CVD, as well as in patients' overall health status, independent of CVD severity and depressive symptoms (Lorig et al., 1999; Sarkar et al., 2007).

In general, the literature on self-efficacy in cardiac patients suggested that heightened self-efficacy is associated with overall patient well-being (Lorig et al., 1999; Stix, 2003) as it predicts an increased uptake of self-management behaviours (Joeke & Van Elderen, 2007). CRPs based on the aforementioned theory are increasingly recognized as key elements to secondary prevention because they reduce the burden of chronic illnesses on the patient (Kennedy, Gask, & Rogers, 2004; Lorig et al.). Consequently, self-efficacy theory is a viable framework for CRPs with demonstrated clinical success. The next chapter provides an overview of the current Ecuadorian cardiac rehabilitation program and enumerates why a profound change is needed in the status quo.

Chapter V

Concerns about the Current Cardiac Rehabilitation Model in Ecuador

Overview of the Ecuadorian Health-Care System

Three fundamental stakeholders support the health-care system in Ecuador: governmental organizations, social security, and private organizations. About 70% of the Ecuadorian population is covered by the Health Ministry's facilities (Ministerio de Salud Pública del Ecuador [MSPE] [Ecuadorian Ministry of Public Health], 2006). The workforce, approximately 18% of the population is covered by the social insurance called "Instituto Ecuatoriano de Seguridad Social" (Ecuadorian Institute of Social Security) (MSPE). Unfortunately, neither system is very efficient, even though the low-income population uses each liberally. The principal reason for its inefficiency is explained by a vertical organizational structure (Robinson, Coulter, & Stuart-Kotze, 2003). Individuals with higher incomes can choose between different alternatives of private care and coverage which include prepaid systems, private insurance and private health-care organizations. However, only 12% of the population can access the private health-care system (MSPE).

Just like to the health-care coverage in Ecuador, the hospital system is also a mixture of public and private institutions (MSPE, 2006). Public hospitals receive funds from the central government while private hospitals are owned by groups of investors and generate their own income. Ecuadorians can access to different specialists depending on the level of complexity of the local health-care facility, possibly including primary and secondary prevention programs. Currently, health-care organizations focus mainly on curative programs (MSPE).

The Ecuadorian health-care system needs to be reformed in order to achieve an ideal balance in health delivery and to provide basic assistance for those with medical needs that exceed their available budgetary resources (MSPE, 2006). Furthermore, it is necessary to balance preventive, educational, and promotional programs with curative programs.

The Ecuadorian Need for a Broader Perspective

Even though the holistic concept of health has drastically changed how health-care providers in North America and Western Europe treat their patients (Schweitzer et al, 2007), existing CRPs in Ecuador are still based on the biomedical model. Presently, this model for patients' treatment is considered inappropriate (Suls & Rothman, 2004; Wise, 2001). For this reason, one of the fundamental requirements in the development of new CRPs in Ecuador is the need for multidisciplinary health teams that are capable of managing cases with a complete understanding of the psychosocial and emotional implications of CVD. Ecuador needs models of health care that can incorporate an increasing partnership between patients and clinicians, share clinical decisions, and contribute to disease management (see Appendix A for details about the Training Professional Health-Care Teams program). The following chapter provides an overview of a self-management cardiac rehabilitation program that is applicable to the country.

Chapter VI

Self-Management Cardiac Rehabilitation Program

Introduction

The Self-Management Cardiac Rehabilitation Program (SMCRP) is a secondary prevention program. Time limited and patient centered, it is built on environmental resources and cultural perspectives, and is focused on problem resolution (AAPC, 2004). The program enhances clients' confidence to achieve treatment goals, learn coping strategies, and develop skills to live an active and meaningful life (Lorig & Holman, 2003). Counselling during SMCRP includes: (a) conceptualization (identification of patients' problems); (b) skill acquisition (developing patients' repertoire of skills through educational and behavioural means); (c) and application (patient's practice of the cognitive changes they achieve in the previous stages) (Brannon & Feist, 2004).

Purpose of the Program

The purpose of SMCRP is to assist patients who suffer from CVD in improving their functional capacity, promoting an active lifestyle, reducing disability and risk factors, creating a sense of self-efficacy and improving their quality of life (Lorig & Holman, 2003; Oldridge & Rogowski, 1990).

Objectives of the SMCRP

The objectives of the SMCRP are to (Holloway & Watson, 2002):

- (a) Provide patients with a framework from which CVD and its physical and emotional sequels are understood and accepted;
- (b) Assist patients to control and modify CVD risk factors;

- (e) Help patients to set clear short-term (weeks or months) and long-term (years) goals and strategies for their recovery, and;
- (d) Support patients to enhance adherence to treatment regimens.

Structure of SMCRP

Patient inclusion criteria. SMCRP is directed to treat adult patients aged 20 and older with various forms of cardiac disease, including myocardial infarction, angina pectoris, recent cardiac surgery, congestive heart failure, valvulopathies, miocardiopathies, cardiac catheterization, recent heart attack, coronary artery bypass graft surgery or PTCA, pacemaker implantation, heart transplant (candidates and recipients), stable chronic heart failure, peripheral arterial disease, or other forms of CVD (Pearson et al., 2002). The target population is independent of patients' gender, race, education, culture, employment status, duration of impairment, and religious affiliation.

Referral criteria. It has been demonstrated that patients receive the most benefit from the program when they are referred soon after hospitalization (Randal et al., 2007). However, if there are clinical, social, and/or logistical reasons that delay enrolment in the program, a patient can join between 2 and 12 months following a cardiac event. An appropriate SMCRP referral includes those made by hospitals and health-care systems, as well as physicians and other health-care settings with primary responsibility for the care of cardiac patients (Randal et al.).

The professional team. For optimal quality of service, a trained, collaborative, and interdisciplinary team of health-care professionals who address patients' biological, psychological, social, and emotional factors facilitates SMCRP. The team is integrated with cardiologists specialized in cardiac rehabilitation, as well as psychologists,

nutritionists, nurses, and physiotherapists. It also would be optimal to train non-health professionals who suffer from CVD to be in charge of the self-management education phase.

Method of the SMCRP

SMCRP has three different phases, as well as two optional programs - smoking cessation and weight management. Phase I is developed during the patient's hospitalization; Phase II and III are delivered in ambulatory setting (Southard et al., 2000).

The primary objective of Phase I is to contact patients and their families in order to establish a trusting relationship. During the Phase I, the professional team gives information about the program, collects a medical history, performs a physical examination, conducts a psychological appraisal, evaluates nutritional and dietary practices, assesses and plans for physical activities, and establishes effective communication between the patient, the patient's family, and the medical-care team (Southard, 2000).

Phase I involves six hours of which one hour is assigned for program induction, one for medical evaluation, one for nutritional evaluation, two for psychological assessment, and one for physical activity evaluation and exercise routine plan initiation.

The primary objective of Phase II is to tailor the cardiac rehabilitation program to effectively address all of the patient's needs. During this phase, the multidisciplinary team works to improve health status and behaviour; build self-efficacy through monitored physical exercise; review and encourage diet changes, and improve responsibility for the day-to-day management of CVD. Optimally, Phase II begins two to ten days after

hospital discharge. It is a 12-week program consisting of 12 one-hour sessions of monitored exercise, two one-hour individualized psychological sessions, and two one-hour nutritional sessions.

Definitions, objectives, human resources, materials, and content of SMCRP Phase I and II are further described in Appendix B. Given the centrality of the counselling received during Phase III to the patient's outcome, it is described in detail below.

SMCRP Phase III

Introduction of Phase III

The counselling portion of Phase III is delivered in a close-group format and encompasses patient education. Focused on self-management skills and strategies to enhance self-efficacy, this phase serves as a source of social support as patients work in collaboration with the counsellor to practice acquired skills. Additionally, it emphasizes the patients' awareness of their own abilities and goal achievement during this process (Randal, 2007). During Phase III, the multidisciplinary professional team continues working together to improve all aspects of the patient's life.

Purpose of Phase III

The purpose of the psycho-educational component of Phase III is to teach patients self-management skills, to enhance self-efficacy, and to achieve increasing independence (Brannon & Feist, 2004).

Objectives of Phase III

The objectives of Phase III are to:

- (a) Enhance clients' efforts to manage their own illnesses;
- (b) Help clients to explore their attitudes toward CVD care;

(c) Develop self-control, an important aspect of stress reduction (Lorig & Holman, 2003).

Structure of Phase III

Professional team. The development of SMCRP Phase III is mainly the responsibility of a clinical psychologist who possesses knowledge in the area of health psychology and trained in cognitive therapy.

Materials. The basic structure of SMCRP during Phase III is guided by the SMCRP Training Guide for Counselling Cardiac Patients (described below) to ensure consistency of content.

Method of Phase III

Duration. Phase III begins after three sessions of Phase II, when it is expected that the patient's self-efficacy has developed through physical activity (Sullivan et al., 1997). It comprises eight sessions each lasting approximately 75 minutes.

Content. The group is formed by a clinical psychologist and comprises between eight and ten patients. The group has a psycho-educational cognitive-behavioural approach with a focus on skill development to enhance self-efficacy. Sessions focus on self-management principles, self-monitoring, and cognitive restructuring, identifying sources of stress, using problem-focused and emotion-focused coping strategies, relaxation training and effective communication (Lorig et al., 1999).

Expected outcomes. At the end of this psycho-educational phase, it is expected that patients will increase their self-efficacy and self-regulation in order to promote emotional control and responsibility about their cardiac conditions (Oldridge & Rogowski, 1990). In addition, it is expected that patients will select one or more self-

management strategies and consistently use them. Desirable patient outcomes during counselling include a lower rate of attrition and an increase in patient's quality of life (Sullivan et al., 2003).

SMCRP Training Guide for Counselling Cardiac Patients

Definition

The psychosocial training outlined in the guide aims to help cardiovascular patients develop the necessary skills for coping with multiple problems related to their health condition. The main goal of the training guide is to enhance emotional management and self-efficacy in patients with a cardiac condition so that they can increase their confidence to cope with long-term changes.

Week 1: Introductory Session

Session rationale. The rationale of the first session is to provide patients with an opportunity to express what they hope to gain from the program, to be introduced to the themes, and understand the program format and rules. The objectives are to:

- (a) Establish the group as a safe place for learning and discussion;
- (b) Facilitate the introduction of each member into the group;
- (c) Clarify the goals of the program;
- (d) Introduce self-management principles.

Procedures. The psychologist (a) encourages members to introduce themselves; (b) gives a brief description of group format and some upcoming topics; (c) asks the members what they hope to gain from this educational phase; and (d) explains issues of confidentiality and respect.

The psychologist then introduces an overview of the self-efficacy theory, self-management and emotional regulation principles and promotes consistent and regular use of previously learned skills. The psychologist should be prepared to answer any medical questions and emotional concerns that patients may present.

Week 2: Self-Monitoring

Session rationale. The second session covers cultural myths and the role of health beliefs in people's behaviours. In addition, this session gives an opportunity to talk about CVD, causes, management, and coping. Before patients can understand their responses to environmental stimuli (i.e., stressors), they need to be clear about the cultural messages attached to health, illness, and lifestyle (French, Marteau, Senior, & Weinman, 2002).

Some of the goals of the second session include the following:

- (a) Members gain an awareness of the predominant myths around health, illness, and coronary disease;
- (b) Members begin to understand the role these myths have played in their own lives.

Procedures. The second session begins with an exercise in which the psychologist writes 10 myths about CVD on separate sheets of paper and posts them around the room. The psychologist talks about these myths by defining them as societal messages accepted as unquestionable truths. Some examples of these CVD myths include the following:

- (a) Health and illness are not under our control;
- (b) I am immune from risks that make other people vulnerable;
- (c) Personal behaviour does not have serious implications for our long-term physical health and our psychological well-being;

- (d) Only biological risk factors produce illness;
- (e) Regular exercise is for young people. Sedentary lives come with age;
- (f) Now that I have a heart condition, I will never be able to do anything I want to do again;
- (g) Unhealthy habits such as the excessive use of alcohol or tobacco do not lead to illness and premature death;
- (h) Emotions and stress do not lead to physical illness;
- (i) Painful emotions are not really important and should be ignored;
- (j) CVD is irreversible and the persons who suffer from it cannot do anything to change it.

Each patient is then given five stickers numbered from 1 to 5 to place a rating above each written myth. A rating of 1 indicates the strongest myth that has influenced his or her life, and a rating of 5 indicates that the myth has had the least influence. When all the stickers have been assigned to one of the CVD myths, the psychologist tabulates the results and selects the top five myths to be discussed. After a group discussion, the psychologist encourages patients to observe and record target behaviours that they want to change. Additionally, the psychologist asks patients to record during the week the antecedents and resulting consequences of their behaviours. Patients are instructed to complete a self-monitoring record of data in order to identify the desired behaviours they want to change and to define their goals for their program. Finally, the psychologist encourages patients to make a specific action plan to eliminate one negative behaviour and to increase one positive behaviour for the coming week. After developing the action plan, patients are asked about their certainty of completing the plan on a 10-point Likert

scale (Trochim, 2006), a rating of 10 meaning “completely sure” and a rating of 1 meaning “not at all sure.” If any response is lower than 7, the psychologist helps patients to change or adapt to their plans. In the following weeks, the patients are asked to report their successes.

Week 3: Orientation to Skill and Relaxation Training

Session rationale. From past experience, it is difficult to focus, be open, and feel energized when feeling ill or preoccupied with physical health. The goal of this session is to teach patients cognitive-behavioural strategies such as deep breathing, relaxation, and physical awareness. The practice of these skills during this session is intended to enhance the patient’s level of control (Bandura, 1977). Patients can use these tools when anxiety, depression, anger, frustration, fear, or guilt get in the way of their ability to act effectively (Freeman, Pretzer, Fleming, & Simon, 2004). Session three has the following objectives:

- (a) To have members recognize how they are affected by emotions;
- (b) To teach and reinforce the physiology of breathing to members.

Skills rationale. Although no one intervention is considered an appropriate method for all people in all circumstances, deep breathing has become an important tool used in medicine, psychology, and self-development (Brannon & Feist, 2004; Cormier & Nurius, 2006). Breathing stimulates the parasympathetic nervous system (PNS) and promotes a relaxation response, calming the central nervous system (Freeman et al., 2004). Some of the benefits that patients can experience include a release of stress and tension, an increase in energy and endurance, an improvement of emotional mastery, an ability to prevent and heal physical problems, an improvement in mental concentration, and enhanced physical performance (Cormier & Nurius).

Exercise. The psychologist instructs patients about the physiology, steps, contraindications, and adverse effects of diaphragmatic breathing (e.g., see Cormier & Nurius, 2006, p. 472). The psychologist instructs the patients to breath in a relaxed fashion until this skill has been mastered. Next, the psychologist introduces instructions for deep muscle relaxation and body scan techniques. The psychologist gives patients the rationale, purpose, and a brief overview of the techniques and guides patients in their practice. For a more detailed presentation of these skills, see Cormier & Nurius, 2006, p. 523.

Discussion. The psychologist and patients discuss the potential applications of the learned skills in real-life situations. Patients are cautioned that mastering these coping strategies will take time and that they will not necessarily be effective in every problematic situation. Nevertheless, the psychologist advises them about the benefits of gaining control over their actual circumstances (Bandura, 1977).

Practice of skills. The patients are instructed to practice breathing techniques twice a day for five minutes (Cormier & Nurius, 2003). In addition, patients are encouraged to practice deep muscle relaxation and body scanning outside the sessions. The psychologist reminds patients to find a quiet place free from distractions and interruptions to practice their skills and start using them in their daily lives (Cormier & Nurius).

Record of skill use. Patients are encouraged to use a daily log to record particular situations they find stressful and the numbers of times the skills were used (Hieber, 1996). The purpose of this self-monitoring strategy is to increase awareness about mood, thoughts, and body sensations accompanying different emotions. Self-monitoring, as well

as the learned cognitive-behavioural strategies, are used intentionally as helping strategies to mold patients' perceived self-efficacy by developing a sense of control over their symptoms (Hieber).

Week 4: Cognitive Restructuring and Positive Thinking

Session rationale. After experiencing a major cardiovascular event, some individuals start to believe that they cannot recover and will never return to previous activities (Lorig & Holman, 2003). Modifying cognitions, rules, expectations, and assumptions (e.g. I will never recover my lifestyle) can provide emotional relief and help patients to have a different picture of their reality (Freeman et al., 2004). This session follows the belief that cognitions are especially important factors that maintain human actions (Bandura, 1997). Therefore, cognitive processes play a prominent role in the acquisition and retention of new behaviour patterns (Bandura). Two main objectives of the fourth session include:

- (a) Patient examination of how they distorted and irrationalize their thinking;
- (b) Patient cognition of environmental contributors, including cultural factors that interfere with their behaviour.

Skill rationale. Cognitive restructuring is a skill to facilitate the patients' awareness about their thoughts and the way they talk to themselves (Freeman et al., 2004). Cognitive skills help patients to change the way they think about themselves, their environment, and other people (Freeman et al.). Once they can identify the negative thoughts that influence their lives, patients can replace or change them (Cormier & Nurius, 2003). By shifting from self-defeating thoughts to self-enhancing statements physiological and emotional responses also can become self-enhancing (Cormier &

Nurius; Lorig & Holman, 2003). These skills can help patients develop more realistic thinking about their health condition and their future.

After providing the treatment rationale, the psychologist begins to present the major components of cognitive restructuring as detailed in Cormier & Nurius, 2003, p. 433. The psychologist should model these processes to give an accurate idea of how to shift self-defeating thoughts to positive self-statements (Cormier & Nurius; Lorig & Holman, 2003). It is important that the psychologist initially helps patients to identify, stop, and replace self-defeating thoughts and then gradually decreases the amount of assistance (Cormier & Nurius). Before any homework is assigned, the patient should be able to practice and carry out this shift in a completely self-directed manner.

Record of skill use. The patients are required to record on a sheet of paper the date and time, the situation, and their automatic thoughts (Hieber, 1996). Afterwards, patients are requested to answer the following questions: (a) What is the evidence that the automatic thought is true? Not true? (b) Is there an alternative explanation? (c) What is the worst scenario that could happen? Could I live through it? What is the best scenario that could happen? What is the most realistic outcome? (d) How do the automatic thoughts affect me? What could be the effect of changing my thinking? (e) What should I do about it? (f) If _____ (a friend's name) was in this situation and had this thought, what would I tell him or her? (Hieber).

Week 5: Identify the Source of Stress/Stimulus Control

Session rationale. Stress problems are often triggered by life events such as serious illness, hospitalization, or job and family stresses (Brannon & Feist, 2004). Once a situation has been resolved, the individual usually returns to what he or she considers

“normal.” However, stressors can remain because of a negative association between the event and the stress response (Brannon & Feist). For example, patients can associate any physical pain with a second cardiac condition and experience a high stress level. With proper and effective training, it is possible to replace these learned negative responses with positive ones (e.g., look for physical discomfort causes without fear of a second cardiac episode) (Freeman et al.). During the fifth session, the two main goals are to enhance patient understanding that:

- (a) Their unhealthy behaviours, such as eating, smoking, drinking, or negative emotional responses, are tied to a great number of antecedents of situations (Cormier & Nurius, 2003), and;
- (b) Modifying the conditions that serve as antecedents (external ones such as eating, smoking, and drinking or internal ones such as fear, depression, anger, and hostility) of the cardiac event, it will be possible to modify their responses and thus change the consequences for their health condition.

Skills rationale. Occasionally, an inappropriate antecedent may be associated with behaviours, and it is possible to think about these antecedents as stimuli that provoke the behaviours. A stimulus-control strategy is based on the idea that reducing or altering these antecedents, in terms of time and place of occurrence, helps to decrease the rate of the behaviour (Cormier & Nurius, 2003; Freeman et al., 2004). Additionally, increasing positive thoughts or signals associated with the behaviour increases that behaviour. Therefore, existing antecedents can be prearranged to make the target behaviour possible or difficult to do (Cormier & Nurius).

During Week 5, the psychologist explains to the patients that behaviours that trouble them may occur because of inappropriate stimulus control. For instance, inappropriate stimulus control may be related to a great number of unhealthy behaviours, such as lack of exercise, obesity, drinking alcohol, smoking, and substance abuse (Sarafino, 2006). The psychologist further explains the theory of change, using the principles and examples of stimulus-control strategies (Freeman et al., 2004). It is important for the psychologist to highlight that this control strategy is implemented to promote positive thoughts and actions to increase the cues associated with patients' ability to manage their health condition (Freeman et al.).

Exercise. Exercise is introduced in the fifth session to decrease maladaptive behaviours and reduce or narrow the frequency of cues associated with these behaviours. For example, exercise may include (a) placing fattening foods in high, hard-to-reach places; (b) practicing deep breathing instead of making outbursts; (c) prearranging cues so that they are controlled by others, for example, asking a patient's wife to be in charge of a diet plan; or (d) asking friends or family to serve only healthy foods or to stop smoking when the patient is present (Cormier & Nurius, 2003).

To alter the time or sequence between the antecedent cues, some of the resulting behaviours may include (a) breaking up the typical sequence (e.g., buying and preparing food only on a full stomach); (b) waking up earlier to follow a physical exercise routine; (c) changing the sequence of behaviours, for example, substituting and engaging in nonfood activities when starting to move toward snacking; or (d) delay food or snacks for a predetermined amount of time (Cormier & Nurius, 2003).

To increase an adaptive behaviour, patients may be encouraged to increase or prearrange the signs associated with the responses (Cormier & Nurius, 2003). For example, adaptive behaviours may include (a) deliberately seeking out the signs to perform the desired behaviour (e.g., initially arranging one room with a treadmill or another training machine to bring the fitness routine to the home); (b) concentrating on the behaviour in a situation and what it means (e.g., concentrating only on training in that room; if distracted, the patient should get up and leave and not mix training with other activities, such as listening to music or talking); (c) gradually extending the behaviour to other situations (e.g., when control has been achieved in training, the patient can generalize the behaviour to another activity or location, such as walking outside); or (d) promoting the occurrence of helpful signs from self-generated reminders or from other people (e.g., asking a partner to provide reminders about the benefits of training) (Cormier & Nurius).

Record of skills use. The psychologist asks the patients to implement daily stimulus control methods for one week. During this time, patients are expected to engage in self-monitoring of their positive target responses and to keep records of the type and the use of the chosen method (Hieber, 1996). At the end of the fifth week, and before the following session, patients are required to review their recorded data and ask themselves some of the following questions: (a) If they used the strategy consistently, what conditions contributed to the positive or negative results? (b) Did they notice any changes in the target behaviour? (c) What have they learned about this strategy that might be helpful for them in the future? (Hieber).

Week 6: Mind and Body Link

Session rationale. Under the biomedical model, the body and mind are considered as separate entities, and patients receive separate treatments from separate systems (Sarafino, 2006). The SMCRP, on the other hand, encourages the patient to consider health and illness as the result of biological and physiological conditions, tied together with psychosocial factors and behaviours. Some of the goals of the sixth session include:

- (a) Patient awareness about their own behaviours, lifestyle, and their physical and emotional responses, and;
- (b) Patient understanding of the connection between their body reactions and the emotional stimulus;

Procedures. The psychologist approaches this educational session with a stress overview, definition, and an explanation on the dimensions of stress (Friedman et al., 1996). The session continues with an explanation about the biological aspects of stress, physiological arousal, and the normal reactions that people and animals have in response to a perceived danger (for a more detailed presentation of stress, physiology, and illness, see Sarafino, 2006, p. 103).

Discussion. The psychologist discusses with the patients some of the causes of stress, alarm reactions, psychosocial factors, and other themes related to body and mind reactions. Also, the psychologist asks patients about their personal experiences in stressful situations (Sarfino, 2006) and helps the group members to identify stressors in their lives, including their physical health symptoms.

Week 7: Self-Efficacy

Session rationale. There are many ways that people react to and cope with success and failure in life. Some people think that they are not capable of performing demanding

tasks, and most of the time they find themselves failing in what they start (Joeke & Van Elderen, 2003, 2007). Others, on the other hand, may consider that their performance will result in desired outcomes due to their abilities or past success (Lorig & Holman, 2003). Therefore, the way people perceive themselves determines the amount of effort they exert, how long they will persevere in doing certain activities, and the amount of energy they will invest to achieve their expected outcomes (Lorig & Holman). Seventh session objectives are for patients to:

- (a) Understand how their own perceptions of their capabilities could influence their performance, and;
- (b) Realize that if they are motivated and energized and have positive internal dialogue, this will foster high levels of attempted performance.

Skill rationale. Self-efficacy is a process that mediates behavioural changes (Bandura, 1977). Self-efficacy refers to our judgments and subsequent beliefs in our capabilities to perform certain tasks under specific situations. If we believe, for instance, that our abilities are sufficient to accomplish a task, then we are more likely to believe that we can accomplish it successfully (Bandura).

Procedure. The psychologist fosters self-efficacy by talking with patients about their past successes in performing different tasks and the results they obtained. For example, during the SMCRP delivery, self-efficacy is enhanced by means of the performance of the patients' physical recovery through an exercise routine (Sullivan et al., 1997).

Discussion. The psychologist promotes discussion about patients' self-efficacy during treatment and in their lives. The psychologist encourages group discussion about

how patients' perceived self-efficacy influences their cognitions, motivation, and therapeutic goals. The psychologist strengthens the patients' self-efficacy and asks them to rate how confident they are about their success. The ratings are measured on an 11-point Likert scale from 0 (uncertain) to 10 (certain).

Record. Patients are encouraged to keep a record of a single task they achieved successfully during the SMCRP. They are encouraged to record thoughts, behaviours, and feelings related to their perceptions of self-efficacy.

Week 8: Problem Solving and Decision Making

Session rationale. CVD often leaves individuals with an inability to solve problems, to make day-to-day decisions in response to changes in their disease condition, or to make informed choices about possible treatments (Lorig et al., 2001; Sarafino, 2006). Some of the objectives for the eight sessions include patient development so that they

- (a) Understand problem-solving and decision-making strategies, and;
- (b) Identify problem-focused and/or emotion-focused components of an issue and to identify problem-solving goals for a specific issue.

Skill rationale. All of us face minor and important difficulties during our lives. Every day we need to make small and important decisions that affect our lives and the lives of others. One way to increase responsibility and self-control is to learn mechanisms for solving our dilemmas. Taking some time before making any decisions may help us to avoid future frustrations, distress, and pain created by a presenting concern (Cormier & Nurius, 2006).

Procedure. After giving a rationale for this strategy, the leader starts to describe the stages of problem solving as presented by D’Zurilla (1986), which include (a) problem orientation, (b) problem definition and formulation, (c) generation of alternative solutions, (d) decision making, and (e) solution implementation.

Exercise. Patients identify situations in which they can practice problem-solving skills. It is important to help patients to follow the stages of problem solving by focusing on just one problem.

Record of skill used. During this week, patients are encouraged to record situations in which they use problem-solving strategies. They are asked to report alternative solutions, including suggestions from friends or health-care professionals, and to describe the possible solutions, solution implementation, evaluation of results, and their plans to take action.

SMCRP Outcomes

It is expected that by the end of the SMCRP, patients will acquire the following:

- (a) Capacity to reduce the physiologic and psychological effects of the cardiac illness;
- (b) Ability to take on an independent, self-management role;
- (c) Competence to execute their desired behaviour successfully;
- (d) Improvement in quality of life and positive changes;
- (e) Adherence to the program and its recommendations. (Brannon & Feist, 2004)

Upon completion of the SMCRP, it is necessary to generate a written report of each patient’s outcomes to present to the patient and to the primary health-care provider.

A written summary should identify any specific areas that may require further intervention and monitoring.

In summary, the SMCRP 8-week program is expected to teach the practice of self-management skills to cardiac patients. Although the program promises to be a positive and self-sustaining resource for patients, only its application, feedback, and results can determine the effect of this training program on patients' self-efficacy. However, to effectively measure the effects of the work on patients' self-efficacy, its achievements, and any differences made in patients' lives, a cardiac Self-Efficacy Questionnaire (Stanford Patient Education Research Center, 2007) is administered both before and after the completion of Phase III (i.e., pre- and post-test measures).

Smoking Cessation and Weight Management Programs

In combination with the SMCRP, smoking cessation and weight management programs are optional programs for patients, who can request them. The development of these programs is beyond the scope of this final project. Nevertheless, these programs are described in the AHA and Core Components of Cardiac Rehabilitation/Secondary Prevention Programs (Balady et al., 2000).

Self-Management Cardiac Rehabilitation Program Evaluation

Nowadays, one of the major challenges facing the health-care system is to coordinate efforts to ensure that optimal patient outcomes have been achieved (Shah, 1998). The American College of Cardiology (ACC) and the AHA have developed performance measures that enable health-care professionals to evaluate the quality of cardiovascular care received by past patients in order to plan future improvements.

The writing committee of the ACC (2007) and AHA (2007) associations worked collaboratively and elaborated on guidelines and recommendations with a high degree of specificity. These guidelines support performance measurement and permit the rapid incorporation of new knowledge. The aforementioned guidelines establish validity, reliability, and feasibility for the foundation of the ACC and AHA data (AACPR, 2007). These measurement sets are intended to serve as a vehicle for more rapidly translating the strongest clinical evidence into practice, to provide ways for measuring the quality of care, and to identify opportunities for improvement (Randal et al., 2007). Therefore, the recommended guidelines are used as a framework to evaluate Phases I and II of the SMCRP.

The SMCRP evaluation process has a strong focus on its consumers, which include the patient, the primary care physician, and health-care systems. Evaluative measures of the program include both program structure and process-based measures, which reliably assess the use of program policies and procedures. (For more detail about organizational structure, appropriate personal, equipment, and process-based evaluation, see Appendix C.)

Chapter VII

Conclusions

While the biomedical model has dominated medical practice during the last century, new models of health care developed over the past few years have revolutionized patient treatment (Sarfino, 2006). These models provide a more comprehensive, less biologically dependent account of illness by focusing on the biophysical and psychosocial dimensions of health and illness (Brannon & Feist, 2004). Under this broader view, health is conceptualized as a multidimensional, cumulative state to be promoted through life (Crichton et al., 2000; Lalonde, 1974; Sarafino; Shah, 1998).

Additionally, determinates of health were modified and a number of strategies were developed or adapted for the promotion of health under these developments. Such interventions completed by system levels rather than isolated elements allow for the concept of systems of health that permit the treatment of the individual as an inseparable unit (Kiecolt-Glaser et al., 2002; Shah, 1998). According to this new framework, four determinants of health were proposed: biological, environmental, lifestyles and behaviours, and health-care organizations (Shah). Further research proposed other determinants of health that include income and SES, social-support networks, education, employment, and working conditions. Additional information includes determinants of an individual's health such as personal health practices and coping skills, healthy childhood development, beliefs and values, and a spiritual dimension (Orth-Gomér, 2007).

The application of the resulting knowledge and the development of technology contributed to the understanding that personal behaviours have serious implications for the long-term physical health and psychological well-being of individuals (Kiecolt-Glaser

et al., 2002). In fact, it was found that preventable illnesses make up approximately 80% of the illnesses spectrum, among which coronary diseases are some of the most significant (Orth-Gomér, 2007).

In chronic and degenerative disorders, such as CVD, no single factor can be identified as the main determinant (Horlick, 1994; Suls & Rothman, 2004). Many risk factors, including chronic conditions, are considered serious (Grundy et al., 1999). However, cigarette smoking, lack of exercise, age, gender, ethnicity, depression, anger and hostility, stress levels, education, and SES are additional risk factors linked to this condition (Orth-Gomér, 2007). The evidence of the relationship between the aforementioned risk factors and CVD raises some serious concerns about the complexity of this health condition. What is unknown is the magnitude that each of these risk factors has as direct or indirect causes of CVD (French et al., 2002). Nevertheless, the holistic conceptualization of human responses has influenced the way in which curative and preventive programs are currently being developed (Kuulasmaa et al., 2000).

CRPs are secondary prevention programs to promote cardiovascular risk reduction, to decrease disability, and to encourage active lifestyle changes (Hughes & Hayman, 2007). Under the biomedical model, cardiac rehabilitation programs focus on helping patients in their physical recovery (Balady et al., 2000). The new definition includes the belief that patients play a significant role in the successful outcome of CRP and recognizes that CRP is an integral part of secondary prevention of CVD (AACVPR, 2007; ACC, 2007; AHA, 2007).

Based on these definitions, several alternative treatments, many of which have demonstrated signs of efficacy, were created as complements to traditional methods

(Vogel et al., 2005). One of these programs, self-efficacy, is based on the social cognitive theory which supports the belief that individuals have some level of control over their lives (Bandura, 1977). According to Bandura, self-efficacy is a psychological construct that describes the interaction between behavioural, personal, and environmental factors.

The aforementioned framework was applied at the Stanford University School of Medicine in order to create programs for patients with chronic conditions, including cardiac disease (Lorig et al., 2003). In general, the literature on self-efficacy in cardiac patients suggests that heightened self-efficacy predicts an increased uptake of behaviour, enhances physical and social functioning, and reduces the burden of CVD symptoms (Lorig et al., 1999; Lorig et al.).

Currently, within the Ecuadorian health care system, the majority of primary and secondary health programs are based on the biomedical model (MSPE, 2006). Programs founded on self-efficacy represent both a challenge and an opportunity to overcome traditional barriers in the management of CVD. However, during the implementation of the SMCRP in Ecuador, some dilemmas were encountered. For instance, the lack of a multidisciplinary health team with the conviction to promote psychosocial factors in patients was cited as one of the major problems (MSPE). Therefore, the first step toward the effective implementation of such a program is to train the health-care team adequately within a holistic framework. Another difficulty cited was related to patient care. Patients have played a passive role in their recovery since the inception of CRPs. Because they do not believe that psychosocial difficulties and environmental circumstances can negatively affect their health, having patients take responsibility for their lives presents

an extra difficulty in their recovery (Balady et al., 2000). Therefore, it is necessary to educate the Ecuadorian population about psychosocial risk factors that affect their health.

As mentioned earlier, SMCRP comprises three phases. Phase I is optimally delivered while the patient is still at the hospital and includes assessment and evaluation of the patient's medical history, physical activity, and nutritional profile as well as psychological testing. Phase II optimally starts immediately following the patient's discharge from the hospital and includes an ongoing medical assessment, patient evaluation, physical examination, self-care plan with detailed priorities for risk reduction, development of an individual diet plan, continuing psychological assessment, individual support, and a structured physical exercise plan. Phase III includes the psycho-educational component of the program and is delivered in a closed-group format. This phase includes self-management, skill training, and development with a focus on enhancing self-efficacy and medical, emotional, and role management to provide patients with the necessary skills to improve their health status. As Lorig and Holman (2003) maintained, the psycho-educational part of the program is vital in order to achieve effective outcomes for patients.

To ensure optimal patient outcomes, program evaluation measures are necessary. The AACVPR (2007), the ACC (2007), and the Performance Measures on Cardiac Rehabilitation/Secondary Prevention Services (AHA, 2007) have demonstrated some of the most relevant measures. The application of these measures is crucial for several reasons. First, these guidelines include a detailed review and ranking of the evidence available for the diagnosis and treatment of specific disease areas. Second, these guidelines serve as a vehicle to effectively implement the strongest clinical evidence to

practice. Finally, evaluation tools help to measure quality of care and identify opportunities for improvement.

To implement the SMCRP effectively is one challenge, but it has been suggested that other cardiac rehabilitation programs are also underutilized. For instance, the AACVPR (2007), the ACC (2007), and the AHA (2007) recognize that less than 30% of eligible patients participate in a CRP. Some of the reasons for the low participation rate are the obstacles encountered during the initial referral process (Balady et al., 2000). While some of these obstacles can be reduced through the systematic adoption of standardized procedures and other similar processes for establishing appropriate referrals (Balady et al.), other proposed reasons for low participation include a lack of physician knowledge about CRP benefits and outcomes (AACVPR; ACC; AHA). Moreover, patients may not always know or pursue the best CRP treatments and strategies (AACVPR; ACC; AHA). As a result, the outcomes of cardiac rehabilitation programs are not optimal despite the inclusion of the best scientific knowledge in the programs (AACVPR; ACC; AHA). For all these reasons, and probably others, there is a need for multiple solutions and approaches to effectively address the delivery and implementation of cardiac rehabilitation programs.

After reviewing the development of the SMCRP, one could conclude, as did Lorig (2003), that “self-management education is more than a nice extra” (p. 3). In fact, self-management programs have been considered to have many purposes, not the least of which is encouraging cardiac patients to live meaningful lives.

Suggestions for Future Projects

Through the present literature review, it was found that the modification of certain cardiovascular risk factors may not only prevent myocardial infarction but could also be strategies that enhance the quality of life (Lorig et al., 2003). There is evidence that smoking, the lack of physical activity and leisure time, and the presence of hypertension, among other cardiac risk factors, are associated with cognitive decline and increased risk for late-life complications (AHA, 2004). In short, it seems that many of the same factors that influence cardiovascular health may impact the overall quality of life. Therefore, it is important that professionals working in the health field educate and coach patients on strategies to reduce unhealthy behaviours and promote overall quality of life.

Additionally, it is necessary to develop effective programs that enhance community self-efficacy and promote self-management strategies to reduce cardiovascular risk factors and to improve health.

The median age for cardiac infarction and referral to CRPs has decreased in the recent past (AHA, 2005). It is imperative that medical professionals in charge of community health understand and promote medical treatment models that, in addition to effectively treating CVD patients, educate their communities to prevent increased recurrence. Continual efforts to promote primary prevention and intervention in the Ecuadorian population is worthy of ongoing project development and research.

References

- Allen, J., & Szanton, S. (2005). Gender, ethnicity, and cardiovascular disease. *Journal of Cardiovascular Nursing, 20*(1), 1–6.
- Allender, S., Peto, V., Scarborough, P., Boxer A., & Rayner, M. (2007). *Coronary heart disease statistics*. London: BHF.
- American Association of Cardiovascular and Pulmonary Rehabilitation. (1999). *Guidelines for cardiac rehabilitation and secondary prevention programs*. Champaign, IL: Human Kinetics.
- American Association of Cardiovascular and Pulmonary Rehabilitation, American College of Cardiology, American Heart Association. (2007). Performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention Services. *Journal of the American College of Cardiology, 50*(14), 1400–1433.
- American Association of Cardiovascular and Pulmonary Rehabilitation Outcome Committee. (2004). *Guidelines for cardiac rehabilitation and secondary prevention programs* (4th ed.). Champaign, IL: Human Kinetics.
- American Heart Association. (1999). Scientific assessment of cardiovascular risk by use of multiple-risk-factor assessment equations. *Circulation, 100*, 1481–1492.
- American Heart Association. (2001). Heart and stroke statistical update. Dallas, TX: Author.
- American Heart Association. (2002). *Heart and stroke facts: Statistical update*. Dallas, TX: American Heart Association; 2001. Retrieved July 14, 2007, from www.americanheart.org/statistics/index.html

- American Heart Association. (2004). *Heart and stroke encyclopedia*. Retrieved August 25, 2007, from http://www.americanheart.org/beatyourrisk/?_requestid=357248#
- American Heart Association. (2005). Heart disease and stroke statistics 2005. Update: American Heart Association. Dallas, TX: Author.
- American Heart Disease and Stroke Statistics. (2005). *Update: American Heart Association*. Dallas, TX: Author.
- Balady, G., Ades, P., Comoss, P., Limacher, M., Pina, I., Southard, D., et al. (2000). Core components of cardiac rehabilitation/secondary prevention programs: A statement for healthcare professionals. *American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation Writing Group*. Retrieved August 15, 2007, from: <http://circ.ahajournals.org/cgi/content/full/102/9/1069>
- Bandura, A. (1997). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215.
- Beckie, T. (2006). A behavior change intervention for women in cardiac rehabilitation. *Journal of Cardiovascular Nursing*, *21*(2), 146–153.
- Blair, S., Cheng, Y., & Holder, J. (2001). Is physical activity or physical fitness more important in defining health benefits? *Med Science Sports Exercise*, *33*, 379–399.
- Blanchard, C., Reid, R., Morrin, L., Beaton, L., Pipe, A., Courneya, K., et al. (2007). Barrier self-efficacy and physical activity over a 12-month period in men and women who do and do not attend cardiac rehabilitation. *Rehabilitation Psychology*, *52*(1), 65–73.

- Brannon, L., & Feist, J. (2004). *Health psychology: An introduction to behaviour and health*, (5th ed.). Toronto, ON: Thomson Learning.
- Bunde, J., & Suls, J. (2006). A quantitative analysis of the relationship between the Cook-Medley Hostility Scale and traditional coronary artery disease risk factors. *Health Psychology, 25*(4), 493–500.
- Carlson, N., & Buskist, W. (1997). *Psychology: The science of behaviour*. Needham Heights, MA: Allyn and Bacon.
- Chobanian, A., Bakris, G., Black, H., Cushman, W., Green, L., Izzo, J., et al. (2003). The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. *Journal of the American Medical Association, 289*(19), 2560–2572.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386–396.
- Cormier, S., & Nurius, P. (2003). *Stress management strategies. Interviewing and change strategies for helpers* (pp. 467–542). Pacific Grove, CA: Thomson Learning.
- Couper, D., Sanford, C., Lamar, V., Tyroler, H., & Mosely, T. (2002). *Tired and angry? Both emotions may predict heart attacks*. Paper presented at the meeting of the American Heart Association. Honolulu, HI: Author.
- Crichton, A., Hsu, D., & Tsang, S. (2000). *Canada's health care system: Its funding and organization*. Ottawa, ON: CHA Press.
- Damasio, A. (2002). How the brain creates the mind. *Scientific American, 12*(1), 4–9.

- Dowd, J., & Goldman, N. (2006). Do biomarkers of stress mediate the relation between socioeconomic status and health? *Journal of Epidemiology & Community Health, 60*(7), 633–639.
- Dubbert, P. (2002). Physical activity and exercise: Recent advances and current challenges. *Journal of Consulting and Clinical Psychology, 70*(3), 526–536.
- Finkelstein, E., Khavjou, O., Mobley, L., Haney, D., & Will, J. (2004). Racial, ethnic disparities in coronary heart disease risk factors among WISEWOMAN enrollees. *Journal of Women's Health, 13*(5) 503–518.
- Freeman, A., Pretzer, J., Fleeming, B., & Simon, K. (2004). *Clinical applications of cognitive therapy* (2nd ed.). New York: Springer Science.
- French, D., Marteau, T., Senior, V., & Weinman, J. (2002). The structure of beliefs about the causes of heart attacks: A network analysis. *British Journal of Health Psychology, 7*(4), 463–480.
- Freud, S. (1923). *Historias clínicas de la histeria [Clinical histories of hysteria]*. Buenos Aires: Graficas Bartolomé.
- Friedman, H., Klein, T., & Friedman, A. (1996). *Psychoneuroimmunology, stress, and infection*. Boca Raton, FL: CRC Press.
- Gallo, L., & Matthews, K. (2003). Understanding the association between socioeconomic status and physical health: Do negative emotions play a role? *Peer Reviewed Journal, 129*(1), 10–51.
- Gardner, J., McConnell, T., Klinger, T., Herman, C., Hauck, C., & Laubach, C. (2003). Quality of life and self-efficacy: Gender and diagnoses considerations for

- management during cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation*, 23, 299–306.
- Gerberding, J. (2007). *Heart disease and stroke: The nation's leading killers' deaths, disability, and cost*. Retrieved November 26, 2007, from <http://www.cdc.gov/nccdphp/publications/AAG/pdf/dhdsp.pdf>
- Glassman, A., & Shapiro, P. (1998). Depression and the course of coronary artery disease. *American Psychiatric Association*, 155, 4–11.
- Greenberg, L. (2001). *Emotion focus therapy: Coaching clients to work through their feelings*. Washington, DC: American Psychological Association.
- Grundy, S., Pasternak, R., Greenland, P., Smith, S., & Fuster, V. (1999). Assessment of cardiovascular risk by use of multiple risk-factors assessment equation: A statement for healthcare professionals from the American Heart Association and the American College of Cardiology. *Journal of the American College of Cardiology*, 34(4), 1348–1359.
- Guarneri, M. (2006). *The heart speaks: A cardiologist reveals the secret language of healing*. New York: Touchstone.
- Gysbers, N., & Henderson, P. (2006). *Developing & managing: Your school guidance and counseling program*. Alexandria, VA: American Counseling Association.
- Hart, P. (2005). Women's perceptions of coronary heart disease: An integrative review. *Journal of Cardiovascular Nurses*, 20(3), 170–176.
- Hayman, L., & Hughes, S. (2006). Progress in prevention: Cardiovascular health for all. *Journal of Cardiovascular Nursing*, 21(2), 154–155.

- Heart and Stroke Foundation of Canada. (2003). *The growing burden of heart disease and stroke in Canada 2003*. Ottawa, ON: Author.
- Hogeboom, C., & Brand, R. (1998). Intensive lifestyle changes for reversal of coronary heart disease. *Journal of the American Medical Association*, 280(23), 2001–2007.
- Holloway, A., & Watson, H. (2002). Role of self-efficacy and behavior change. *International Journal of Nursing Practice*, 8, 106–115.
- Horlick, L. 1994. Dyslipidemia and metabolic factors in the genesis of heart attack and stroke. *Health Reports*, 6(1), 94–9. Retrieved November 27, 2007, from <http://www.ncbi.nlm.nih.gov/pubmed/7919096>
- Hughes, S., & Hayman, L. (2007). Cardiovascular risk reduction: The fountain of youth. *Journal of Cardiovascular Nursing*, 22(1), 84–85. Retrieved October 10, 2007, from <https://www.nursingcenter.com/library>
- Instituto Nacional Estadísticas y Censos [National Statistics Institute]. (2005). *Statistics of main causes of death in Ecuador*. Retrieved November 12, 2007, from http://www.inec.gov.ec:8080/web/guest/institucion/regionales/reg_cen/est_soc/est_vit/est_nac.
- Joekes, K., & Van Elderen, T. (2007). Self-efficacy and overprotection are related to quality of life, psychological well-being and self-management in cardiac patients. *Journal of Health Psychology*, 12(1), 4–16.
- Kawachi, I., Sparrow, D., Spiro, A., Vokonas, P., Weiss, S., Dowd, J., et al. (2006). The normative aging study. *Epidemiological Community Health*, 60, 633–639.
- Kemp, D., Malhotra, S., Franco, K., Tesar, G., & Blonson, D. (2003). Heart disease and depression: Don't ignore the relationship. *Journal of Medicine*, 70(9), 745–761.

- Kennedy, A., Gask, L., & Rogers, A. (2005). Training professionals to engage with and promote self-management. *Health Education Research, 20*(5), 567–578.
- Kiecolt-Glaser, J., McGuire, L., Robles, T., & Glaser, R. (2002). Psychoneuroimmunology and psychosomatic medicine: Back to the Future. *Journal of Psychosomatic Medicine, 64*(1), 15–28. Retrieved October 1, 2005, from OVID database.
- Kirkland, S., MacLean D., Langille, D., Joffres M., McPherson K., & Andreou, P. (1999). Knowledge and awareness of risk factors for cardiovascular disease among Canadians 55 to 74 years of age: Results from the Canadian heart health surveys, 1986–1992. *Canadian Medical Association Journal, 161*(8), 10–16.
- Kop, W. (2003). Brain, behaviour and immunity: Psychological risk factors and immune system involvement in cardiovascular disease. *Behavioural Medicine, 17*(4), 233–237.
- Kuper, H., Marmot, M., & Hemingway, H. (2002). Systematic review of prospective cohort studies of psychosocial factors in the etiology and prognosis of coronary heart disease. *Seminars in Vascular Medicine 2*, 267–314.
- Kuulasmaa, K., Tunstall-Pedoe, H., Dobson, A., Fortmann, S., Sans, S., Tolonen, H., et al. (2000). Estimation of contribution of changes in classic risk factors to trends in coronary-event rates across the WHO MONICA project populations. Retrieved October 10, 2007, from <http://www.ktl.fi/publications/monica/index.html>
- Lalonde, M. (1974). *A new perspective on the health of Canadian*. Public Health Agency of Canada, Minister of National Health and Welfare, Cat.No.H31-1374 ISBN 0-

662-50019-9. Retrieved November 10, 2007, from <http://www.phac-aspc.gc.ca/ph-sp/phdd/pdf/perspective.pdf>

Langille, D. (Ed.). *The Amherst Initiative for Healthy Adolescent Sexuality (AIHAS) final report*. Halifax: Dalhousie University, 1999.

Lawson, R., Evans, J., Vasan, R., Murabito, J., Kelly-Hayes, M., & Benjamin, E. (2005). Depressive symptoms, coronary heart disease, and overall mortality in the Framingham Heart Study. *Psychosomatic Medicine*, *67*, 697–702.

Lazarus, R. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, *44*, 1–22.

Lorig, K. (2003) Self-management education: More than a nice extra. *Medical Care*, *41*(6), 699–701.

Lorig, K., & Holman, H. (2003). Self-management education: History, definition, outcomes, and mechanisms. *Annals of Behavioural Medicine*, *26*(1), 1–7.

Lorig, K., Ritter, P., & Gonzalez, V. (2003). Hispanic chronic disease self-management: A randomized community-based outcome trial. *Nursing Research*, *52*(6), 361–369.

Lorig, K., Sobel, D., Stewart, A., Brown, B., Bandura, A., Gonzalez, V., et al. (1999). Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization. *Medical Care*, *37*(1), 5–14.

Lozada, P., Aguinaga, P., Páez, R., Olmedo, C., & Pozo, A. (1996). El peso de la enfermedad en el Ecuador [The impact of the disease in Ecuador]. Retrieved May, 11, 2007 from www.opsecu.org/bevestre/revistas/CEPAR/pesoenf.pdf

- MacLean, D. (1999). Cardiovascular disease: risk factors in older Canadians. *Canadian Medical Association Journal*, *19*(8), 161–169.
- Marks, R., Allegrante, J., & Lorig, K. (2005). A review and synthesis of research evidence for self-efficacy–enhancing interventions for reducing chronic disability: Implications for health education practice. *Health Promotion Practice*, *6*(1) 37–43.
- Massé, R., & Gilbert, L. (2003). *The Québec Public Health Program 2003–2012*. The Direction générale de la santé publique of the ministère de la Santé et des Services sociaux.
- McEwen, B., & Norton, E. (2003). Allostatic load: When protection gives way to damage. *Journal of Advances in Mind-Body Medicine*, *19*(1), 28–32. Retrieved October 3, 2005, from OVID database.
- Ministerio de Salud Publica del Ecuador, [Ecuadorian Ministry of Public Health]. (2006). *Instituciones de salud*. Retrieved October 9, 2007, from Ministry of Public Health Information Office Online via MSP Access at <http://www.msp.gov.ec/>
- Myers, J., Sweeney, T., Witmer, J., & Melvin, J. (2000). The wheel of wellness counseling for wellness: A holistic model for treatment planning. *Journal of Counseling & Development*, *78*(3), 251–267.
- National Heart, Lung, and Blood Institute. (2005). *Framingham Heart Study*. (Government ClinicalTrials.gov Identifier: NCT00005121) Framingham, MA: US Health Authority: Author.
- Oakley, (2004). How the mind hurts and heals the body. *American Psychologist Journal*, *59*(1), 29–40. Retrieved September, 29, 2005, from PsycINFO database.

- Oldridge, N., & Rogowski, B. (1990). Self-efficacy and in-patient rehabilitation. *American Journal of Cardiology*, *66*, 362–365.
- Ornish, D., Scherwitz, L., Billings, J., Gould, K., Merritt, T., Sparler, S., et al. (1998). Intensive lifestyle changes for reversal of coronary heart disease. *JAMA: Journal of the American Medical Association*, *280*(23), 2001–2007. Retrieved November 27, 2006, from PsycINFO database.
- Orth-Gomér, K. (2001). Women and heart disease: New evidence for psychosocial, behavioral, and biological mediators of risk and prognosis. *International Journal of Behavioral Medicine*, *8*(4), 251–269.
- Orth-Gomér, K. (2007a). Job strain and risk of recurrent coronary events. *Journal of the American Medical Association*, *298*(14), 1693–1694.
- Orth-Gomér, K. (2007b). Psychosocial and behavioral aspects of cardiovascular disease prevention in men and women. *Behavioural Medicine*, *20*(2), 147–151.
- Orth-Gomér, K., Horsten, M., & Wamala, S. (1998). Social relations and extent and severity of coronary artery disease. *European Heart Journal*, *19*, 1648–1656.
- Paisa, P. (2006). Preventing ischemic heart disease in developing countries. *Evidence-based Cardiovascular Medicine*, *10*(2), 85–88.
- Pearson, T., Blair, S., Daniels, S., Eckel, R., Fair, J., Fortmann, S., et al. (2002). AHA guidelines for primary prevention of cardiovascular disease and stroke. *Journal of the American Heart Association*, *106*, 388–391. Retrieved January 7, 2008, from <http://circ.ahajournals.org/cgi/reprint/106/3/388>

- Pegus, C., Bazzarre, T., Brown, J., & Menzin, J. (2002). Effects of the heart at work program on awareness of risk factors, self-efficacy, and health behaviors. *Journal of Occupational & Environmental Medicine*, 44(3), 228–236.
- Pert, C. (1997). *Molecules of emotion*. New York: Tom Listone.
- Public health agency of Canada. (2004). 2004–2005 departmental performance report. Retrieved September 13, 2006, from http://www.tbs-sct.gc.ca/rma/dpr1/04-05/PHAC-ASPC/PHAC-ASPCd45_e.pdf
- Randal, T., King, M., Lui, K., Oldridge, N., Piña, I., & Spertus, J. (2007). Performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services. *Journal of the American College of Cardiology*, 50, 1401–1410.
- Reaven, G., & Chen, Y. (1996). Insulin resistance, its consequences, and coronary heart disease. *Circulation*, 93, 1780-1783.
- Remor, E. (2006). Psychometric properties of a European Spanish version of the perceived stress scale (PSS). *The Spanish Journal of Psychology*, 9(1), 86–93.
- Robertson, D., & Keller, C. (1992). Relationships among health beliefs, self-efficacy, and exercise adherence in patients with coronary artery disease. *Heart & Lung*, 21, 56–63.
- Robinson, S., Coulter, M., & Stuart-Kotze, R. (2003). *Management* (7th ed.). Toronto, CA: Prentice Hall.
- Rosamond, W., Flegal, K., Friday, G., Furie, K., Go, A., Greenlund, K., et al. (2007). Heart disease and stroke statistics 2007 update: A report from the American Heart

Association Statistics Committee and Stroke Statistics Subcommittee.

Circulation, 115(5), 69–171.

Sarafino, E. (2006). *Health psychology: Biopsychosocial interactions* (5th ed.). Hoboken, NJ: John Wiley & Sons.

Sarkar, U., Ali, S., & Whooley, M. (2007). Self-efficacy and health status in patients with coronary heart disease: Findings from the Heart and Soul Study. *Psychosomatic Medicine*, 69(4), 306–312.

Scholz, U., Sniehotta, F. F., & Schwarzer, R. (2005). Predicting physical exercise in cardiac rehabilitation: The role of phase-specific self-efficacy beliefs. *Journal of Sport & Exercise Psychology*, 27, 135–151.

Schweitzer, R., Head, K., & Dwyer, J. (2007). Psychological factors and treatment adherence behavior in patients with chronic heart failure. *Journal of Cardiovascular Nursing*, 22(1), 76–83.

Shah, C. (1998). *Public health and preventive medicine in Canada*, (4th ed.). Toronto, ON: University of Toronto Press.

Smith, T., & Gallo, L. (1999). Hostility and cardiovascular reactivity during marital interaction. *Psychosomatic Medicine*, 61, 436–445.

Smith, T., & Ruiz, J. (2002). Psychosocial influences on the development and course of coronary heart disease: Current status and implications for research and practice. *Journal of Consulting and Clinical Psychology*, 70(3), 548–568.

Song, K. (2003). The effects of self-efficacy promoting cardiac rehabilitation program on self-efficacy, health behavior, and quality of life. *Korean Med*, 33(4), 510–518.

- Southard, D., Williams, M., Bazzarre, T., Balady, G., Ades, P., Comoss, P., et al. (2000). Core components of cardiac rehabilitation/secondary prevention programs. *American Heart Association, Circulation, 102*, 1069–1073.
- Stanford Patient Education Research Center. (2007). *Chronic disease self-management program questionnaire code book*. Stanford University. Retrieved January 10, 2008, from <http://patienteducation.stanford.edu>
- Statistics Canada. (2007a). *The leading causes of death at different ages, Canada: Product main page*. Retrieved December 10, 2007, from <http://www.statcan.ca/bsolc/english/bsolc?catno=84F0503X>
- Statistics Canada. (2007b). *Selected leading causes of death: Age-standardized mortality rates by selected causes*. Retrieved December 8, 2007, from <http://www40.statcan.ca/101/cst01/health30a.htm>
- Stenberg, E., & Gold, P. (2002). The mind-body interaction in disease. *Scientific American, 12*(1), 82–89.
- Steptoe, A., Doherty, S., Kerry, S., Rink, E., & Hilton, S. (2000). Socio-demographic and psychological predictors of changes in dietary fat consumption in adults with high blood cholesterol following counseling in primary care. *Health Psychology, 19*(5), 411–419.
- Stix, G. (2003). Ultimate self-improvement. *Scientific American, 289*(3), 44–45.
- Strecher, V., McEvoy De Vellis, B., Becker, M., & Rosenstock, I. (1986). The role of self-efficacy in achieving health behavior change. *Health Education Quarterly, 13*, 73–91.

- Strike, P., & Steptoe, A., (2005). *Center for the advancement of health: Extreme exertion, emotion can spark repeat heart attacks*. Retrieved November 15, 2005, from <http://www.sciencedaily.com/releases/2005/03/050322134150.htm>
- Sullivan, M., LaCroix, A., Russo, J., & Katon, W. (1998). Self-efficacy and self-reported functional status in coronary heart disease: A six-month prospective study. *Psychosomatic Medicine, 60*, 473–478.
- Suls, J., & Bunde, J. (2005). Anger, anxiety, and depression as risk factors for cardiovascular disease: The problems and implications of overlapping affective dispositions. *Psychological Bulletin by the American Psychological Association, 131*(2), 260–300.
- Suls, J., & Rothman, A. (2004). Evolution of the biopsychosocial model: Prospects and challenges for health psychology. *Health Psychology, 23*(2), 119–125.
- Sweeney, T., & Witmer, J. (1991). Beyond social interest: Striving toward optimal health and wellness. *Individual Psychology, 47*, 527–540.
- Swenson, C., Marshall, J., Mikulich-Gilbertson, S., Baxter, J., & Morgenstern, N. (2005). Physical activity in older, rural, Hispanic, and Non-Hispanic white adults. *American College of Sports Medicine, 37*(6), 995–1002.
- Taylor, S., Kemeny, M., Reed, G., Bower, J., & Gruenewald, T. (2000). Psychological resources, positive illusions, and health. *American Psychologist Journal, 55*(1), 99–109.
- Thompson, S., Sobolew-Shubin, A., Galbraith, M., Schwankovsky, L., & Cruzen, D. (1993). Maintaining perceptions of control: Finding perceived control in low-

control circumstances. *Journal of Personality and Social Psychology*, 64(2), 293–304.

Trochim, W. (2006). *Research methods knowledge base*. Retrieved January 5, 2008, from <http://www.socialresearchmethods.net/kb/index.php#about>

Tunstall-Pedoe, H., Kuulasmaa, K., Mähönen, M., Tolonen, H., Ruokokoski, E., & Amouyel, F. (1999). Contribution of trends in survival and coronary event rates to changes in coronary heart disease mortality: 10-year results from 37 WHO MONICA Project populations. *The Lancet*, 353, 1547–1557.

U. S. Department of Agriculture. (n.d.). *The Center for Nutrition Policy and Promotion: My pyramid plan*. Retrieved November 20, 2006, from <http://www.mypyramid.gov/>

U. S. Department of Health and Human Services. (2007). *Estimated direct and indirect costs of major cardiovascular diseases and stroke*. Retrieved December 7, 2006, from http://www.cdc.gov/nccdphp/publications/AAG/dhdsp_text.htm#1

Valenti, L., Lim, L., Heller, R., & Knapp, J. (1996). An improved questionnaire for assessing quality of life after acute myocardial infarction. *Quality of Life Research*, 5, 151–161.

Vogel, J., Bolling, S., Costello, R., Guarneri, E., Krucoff, M., Longhurst, J., et al. (2005). Integrating complementary medicine into cardiovascular medicine. A report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents: Expert Consensus Document on Complementary and Integrative Medicine. *Journal of the American College of Cardiology*, 46(1), 184–221.

- Wannamethee, S., Shaper, R., Whincup, P., & Walker, M. (1999). Role of risk factors for major coronary heart disease events with increasing length of follow up. *Heart, 81*, 374–379. Retrieved August 22, 2007, from <http://heart.bmj.com/>
- Weber, M. (2006). Hypertension treatment and implications of recent cardiovascular outcome trials. *Journal of Hypertension, 24*(2), 37–44.
- Week, A., Juel, K., & Vaeth, M. (1988). Cardiovascular death and manic-depressive psychosis. *Journal of Affect Disorders, 13*, 287–292.
- Wise, M. (2001). *Learning to live beyond a heart event: A case study of learning on-line*. Unpublished doctoral dissertation, University of Wisconsin, Madison.
- Witmer, J., & Sweeney, T. (1992). A holistic model of wellness and prevention over the life span. *Journal of Counselling & Development, 71*, 140–148.
- World Health Organization. (2001). *Men, ageing and health*. Retrieved July 20, 2007, from whqlibdoc.who.int/hq/2001/WHO_NMH_NPH_01.2.pdf
- World Health Organization. (2003). *Tobacco control country profiles* (2nd ed.). Retrieved August 25, 2007, from <http://www.who.org>.
- World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence & practice*: Report of the WHO, Department of Mental Health and Substance Abuse with the Victorian Health Promotion Foundation and the University of Melbourne. Geneva, Switzerland. (ISBN 9241591595-NLM classification: WM 31.5)
- WHO, Health and Welfare Canada, and Canadian Public Health Association. (1986). *Ottawa charter for health promotion*. Ottawa, ON: Canadian Public Health Association.

- Wright, C., Barlow, J., Turner, A., & Bancroft, G. (2003). Self-management training for people with chronic disease: An exploratory study. *British Journal of Health Psychology, 8*, 465–476.
- Yang, L., Liu, K., Daviglius, M., Colangelo, L., Kiefe, C., Sidney, S., et al. (2006) Education, 15-year risk factor progression, and coronary artery calcium in young adulthood and early middle age: The coronary artery risk development in young adults, (CARDIA) study. *Journal of the American Medical Association, 295*, 1793–1800.
- Young, C., Peterson, J., Allegrante, J., & Charlson, M. (2001, October). *The use of individualized risk factor information to promote health behavior change among angioplasty patients*. Poster session presented at the annual meeting of the Society for Public Health Education, Atlanta, GA.

Appendices

Appendix A: Training Professional Health-Care Teams

Introduction

The cardiac rehabilitation field is multidisciplinary by nature (Southard, 2000). Patients receiving complex regimens of care require the work of a variety of health-care professionals from diverse disciplines. The development of a coordinated and multidisciplinary approach to cardiac patient care would provide an effective platform to deliver cardiac rehabilitation programs and to produce better patient outcomes (Randal et al., 2007).

Purpose of the Training Program

It is essential that the multidisciplinary team in charge of the cardiac rehabilitation program works with a collaborative philosophy in mind, shares interests in humanistic skills, and understands the importance of psychosocial factors in health (Pearson et al, 2002). Consequently, before developing an effective cardiac rehabilitation program, it is essential to train a professional health-care team on psychosocial factors, physiological responses, and on the links between the brain, emotions, and well-being.

Objectives of the Training Program

The objectives of training a multidisciplinary team of health professionals are to:

- (a) Remind the health-care team about the importance of building a strong therapeutic relationship in which sensitivity, warmth, concern, and respect are present (Kennedy, Gask, & Rogers, 2005).

- (b) Become aware that a patient's behaviour, thoughts, feelings, environment, and lifestyle have significant implications for treatment outcomes (Oldridge & Rogowski, 1990).

Structure of the Training Program

Inclusion criteria. The training program is intended for cardiologists and cardiologists specializing in cardiac rehabilitation, psychologists, nutritionists, nurses, physiotherapists, and health professionals with a strong background in management of chronic diseases or preventive health programs.

Professional team. The training is coached by a cardiologist with a specialization in cardiac rehabilitation and by a psychologist with knowledge in the field of health psychology (Pearson et al., 2002).

Method of the Training Program

Content. This training program is supported by the conviction that to “the extent in which health professionals are able to initiate and participate in effective communication with patients they can make a difference in encouraging and supporting decision making and self-care actions in patients” (Lorig et al., 1999, p. 4). The program provides the guidelines for developing a strong relationship between health-care practitioners and patients. In addition, informs health professionals about major psychosocial factors that influence health and disease, the reasons for patients not adhering to medical regimens, and the ways to detect and improve low observance of exercise routine, diet, and emotional control (Oldridge & Rogowski, 1990). The identified training skills include listening and communication, which imply the understanding that medical and technical jargon can create confusion, incorrect ideas, and

dissatisfaction (Sarafino, 2006). Additionally, the training covers interviewing skills and the use of open questions to facilitate recollection of information about the history and progression of the illness. Finally, this training distributes information about the SMCRP, the importance of secondary prevention, and the program's expectations (Lorig et al.).

The SMCRP training program focuses on the following (Lorig et al., 1999, p. 8):

- (a) Models of health;
- (b) Psychology in medical settings;
- (c) Capacity to build a strong relationship with others;
- (d) Training in patient-centered communication;
- (e) Major psychological, behavioural, and psychosocial risk factors for heart disease;
- (f) History and research of PIN;
- (g) Problems of adherence;
- (h) Self-management programs, including core skills and resources;
- (i) Psychological measures, including conceptualizing clients concerns;
- (j) Community conditions in reducing cardiovascular risk factors.

Duration. The training program is delivered at the medical center in a workshop format for four hours twice a week for three weeks. The total training duration is 24 hours. The training methods include focus groups, discussions, and video demonstration examples.

Expected outcomes. Following the training program, it is expected that each member of the multidisciplinary health team should have the ability to better empathize with patients, even in the most challenging of circumstances (Kennedy et al., 2005).

Members should be able to be friendly, show interest in patients as persons, show empathy for their internal state, and project a feeling of reassurance in a calm and competent manner. In addition, members should be able to call on the skills of colleagues when referral is appropriate, carry out appropriate responsibilities, help to ensure that all the needs of each patient are met, and gather evidence to support the management and prosecution of each case.

Appendix B: SMCRP Phase I and Phase II

Introduction

Phase I starts when patients are still hospitalized or immediately afterward by providing them with information about the program and ways to better manage their health condition. They are advised about the need to change various unhealthy behaviours, when appropriate, including emotional care, diet, exercise, smoking cessation, and weight management. They are also advised of the requirement to follow treatment regimens (Schweitzer, 2007). This phase includes cardiological, nutritional, psychological, and physical activity assessment.

Purpose of Phase I

The purpose of Phase I is to contact the patients and their families in order to establish a trusting relationship with the medical-care team and help patients manage their health conditions.

Objectives of Phase I

The objectives of Phase I are to:

- (a) Inform the patient and his or her family about the program;
- (b) Collect the patient's information and doing a medical history;
- (c) Conduct a physical examination and psychological appraisal;
- (d) Evaluate nutritional intake and implement dietary changes;
- (e) Assess and plan physical activities;
- (f) Establish active and effective communication (Southard, 2000).

Structure of Phase I

Professional team. The multidisciplinary team in charge of the program is composed of a program coordinator; function performed by a health professional with strong background in management of chronic diseases or preventive health programs. The team also includes a cardiologist specialized in cardiac rehabilitation, a psychologist with knowledge of health psychology and cognitive and behavioural therapy, a nutritionist with knowledge in preventive programs, and a physiotherapist with background in personal training (Pearson et al., 2002).

Materials. A folder given to patients is used for informational purposes. It includes data about the multidisciplinary health team, program's framework, the program's description and cost. It also includes a pamphlet with relevant dietary information and a list of relevant website addresses including the MyPyramid website (<http://www.mypyramid.gov/>).

Cardiac patients are assessed using a standard medical intake. A psychological intake interview is used to build a therapeutic alliance and to identify each patient's needs and goals. The patient's current anxiety and depression levels are evaluated through the Clinical Anxiety Scale (CAS) and the Depression-Happiness Scale (DHS). A nutritional assessment is used to evaluate alimentation habits. Finally, a physical activity assessment is used to evaluate the patient's physical condition and to tailor an exercise routine plan.

Method of Phase I

Content. This step includes checking for a proper referral, establishing direct contact with the cardiologist or the primary health-care professional, and gathering all required information (Balady et al., 2000).

The medical intake interview used in the program is a comprehensive, standardized patient assessment that includes the patient's physical evaluation and appraisal of cardiovascular risk factors upon entry to the cardiac rehabilitation program (AACPR, 2004). This written record collects the client's demographic information, current health and medical concerns, cardiac function, medication, diet habits and exercise patterns, smoking, resting routine, family, marital status, sexual history, and social support. It also includes a description of the illness, the number of months since myocardial infarction or diagnosis of cardiac heart failure, secondary diagnostics, cures, and treatment of the disease. In addition, the health professional gathers information about the patient's health problems and whether the patient is struggling with problems in his or her living situation, including serious vulnerabilities, overwhelming pressures, dependence on other people, overprotection, and perception of control over the situation (Balady et al., 2000). This intake also includes patient's health concerns and significant changes in both somatic and cognitive complaints.

Medical assessment. The medical assessment is done by a cardiologist specialized in cardiac rehabilitation. The medical assessment includes gathering information on the patient's medical history, vital signs, symptoms, disease progression, and medication. It also involves a cardiovascular and pulmonary examination, a post-procedure wound sites, joints, and neuromuscular examination, and an evaluation of hypertension, and weight (AACPR, 2004). In addition, the cardiologist is in charge of assessing the current level of physical activity and planning the patient's exercise routine. The exercise prescription should specify the frequency, intensity, duration, and modalities of the exercise program (Pearson et al., 2002).

Psychological assessment. Part of the first contact with the patient consists of an evaluation of anxiety and depression, discussion about stress reaction, analysis of the importance of adherence to lifestyle modifications, and the repercussion of changes in the patient's quality of life. In this program, the CAS and DHS are used. Both scales contain easy-to-understand questions, are clinically proven in Spanish-language form, and provide good information about the patient's emotional state. It is also important that the patient's family be informed about the benefits of emotional support and the risks of overprotection, because of overprotection "is associated with feelings of distress and lowered quality of life" (Joekes & Van Elderen, 2007, p. 13).

Nutritional assessment and dietary changes. The nutritional assessment includes the evaluation of eating habits, number of meals, snacks, frequency of dining out, and alcohol consumption. The total daily caloric intake and the dietary content of fat, saturated fat, cholesterol, sodium, and other nutrients are also evaluated. The nutritionist evaluates target areas for nutrition intervention (AACPR, 2004). Following the assessment, a nutritionist tailors a diet plan and prescribes the patient's initial diet.

Physical activity assessment. This assessment evaluates the patient's physical activity level, sports involvement, sedentary habits, and possible limitations. The exercise program is very structured and consists of a routine of exercises, depending on the patient's condition (Balady et al., 2000). During this phase, the patient's physical activity starts with slow motor movements as prescribed by a cardiologist who is specialized in cardiac rehabilitation.

Duration. This phase involves six hours of which one hour is assigned for program induction, one hour for medical evaluation, one hour for nutritional evaluation

and initial diet changes, two hours for psychological assessment, and one hour for physical activity evaluation and exercise routine plan initiation.

Induction. The person in charge of the program's induction completes the forms, gives information about the program, collects medical information, and informs the patient and the primary-care provider about the program's process and expected outcomes (Pearson et al., 2002).

Expected outcomes. Following completion of Phase I, an effective relationship should exist among patients, family members, and the multidisciplinary team. An effective relationship is expected to contain three elements: agreement on treatment goals, a shared understanding of the rationale for specific tasks to facilitate reaching those goals, and an interpersonal bond of mutual trust and care.

The treatment team should have written records of the patient's medical, psychological, nutritional, and physical activity evaluations (AACPR, 2004). This information is used as a basis for the intervention, care plan, risk reduction, and short- and long-term goals. Finally, at the end of this phase, it is expected that patients practice deep breathing, have an individualized diet plan, and start a physical exercise routine.

SMCRP Phase II

Introduction to Phase II

Phase II begins 2 to 10 days after hospital discharge. In this phase, ongoing cardiological, psychological, and nutritional assessments are done at early, mid, and late-treatment stages. Phase II combines exercise training, nutritional counselling, and educational sessions about heart disease, CVD risk factors, It is a twelve-week program

consisting of twelve one-hour sessions of monitored exercise, two one-hour individualized psychological sessions, and two one-hour nutritional sessions.

Purpose of Phase II

The purpose of this phase is to tailor the cardiac rehabilitation program to effectively address all of the patient's needs.

Objectives of Phase II

The objectives for this phase are to:

- (a) Improve health status, health behaviour, and self-efficacy;
- (b) Build self-efficacy through monitored physical exercise;
- (c) Transfer responsibility for the day-to-day management of CVD to the patient.

(Randal et al., 2007).

Structure of Phase II

Professional teams. The medical team's functions and procedures depend on individual patient requirements. It is important to identify the elements and mechanics of the medical procedures that enhance or pressure the teamwork to make this multidisciplinary task a reliable system of care (Randal et al., 2007).

Materials

- (a) Standard medical evaluation sheet;
- (b) Psychological assessment;
- (c) Perceived Stress Scale;
- (d) CAS, DHS;
- (e) Nutritional assessment;
- (f) Stress measures

Method of Phase II

Phase II starts with a medical history, including tests and exams gathered in Phase I. The results obtained during participation of Phase I are confirmed, and other factors are assessed, including medical adherence, psychosocial factors, and dietary changes. The evaluation in this phase helps to tailor the SMCRP to the patient's need by setting specific goals for each area of treatment, scheduling appointments, testing the individualized exercise program (Randal et al., 2007).

Medical assessment. The medical assessment confirms information about cardiovascular diagnoses and prior cardiovascular procedures, co-morbidities, symptoms of cardiovascular disease, risk factors, medications, and daily life activities, including driving, sexual activity, sports, gardening, and household tasks (Pearson et al., 2002). It includes a physical examination, vital signs evaluation, cardiovascular and pulmonary examination, and evaluation of post-procedure wound sites, and a joint and neuromuscular examination. This ongoing medical evaluation helps to assess the patient's physical abilities, medical limitations, exercise tolerance, and other medical conditions present during this time. During this phase, provides advice, support, and counselling about physical activity needs, evaluates the exercise program, and sets goals to increase physical activity. In addition, the cardiologist considers simulated work testing for patients with heavy labour jobs, explores daily schedules to suggest how to incorporate increased activity into usual routines, and recommends a gradual increase of low-impact aerobic activity to minimize risk of injury (Balady et al., 2000).

Psychological individual sessions. The psychologist measures anxiety, depression, anger, and hostility symptoms using the same test and scales to confirm

changes in the patient's condition or to corroborate previous results. During these sessions, the psychologist assesses perceived stress using a sixteen-point, four-item Spanish version of the Perceived Stress Scale (Remor, 2006). To assess the patient's social support system, the following question is asked: "Do you have as much contact as you like with someone you feel close to, someone in whom you can trust and confide (yes/no)?" (Sarkar, Ali, & Whooley, 2007, p. 308). In addition, in these sessions the psychologist takes some time to talk and ask questions about sexual dysfunction or maladjustment, substance abuse (e.g., alcohol or other psychotropic), and the effect of the cardiac process on the patient's family members and relationships. The goals of these sessions are to improve psychosocial well-being, reduce stress, and facilitate functional independence. However, no disease-specific content is taught.

Nutritional individual sessions. During these two nutritional sessions, a nutritionist evaluates the patient's safety and adherence to nutritional changes and their impact on the lives of the patient and his or her family (Randal et al., 2007). In addition, these sessions assess target areas in nutrition in order to prescribe specific dietary modifications, verify amounts of saturated fat and cholesterol ingested, and educate and counsel the patient and family members regarding healthy dietary habits. Finally, a nutritionist extends efforts to motivate patient adherence to the prescribed diet by highlighting and identifying future improvements in quality of life (Balady et al., 2000). To measure and monitor diet changes and improvements, a nutritionist uses follow-up questionnaires and informs the primary health-care provider of the results.

Exercise performance. During this phase, patients start a one hour structured and monitored (telemetry) exercise routine three times a week at the medical center. An initial

exercise stress test is performed and periodically repeated as changes in the clinical condition warrant. The test includes assessment of heart rate and rhythm, signs, symptoms, and exercise capacity (Balady et al., 2000). With these results, the physician develops and adjusts a documented exercise plan, keeping records of resistance training, risk stratification, and resources. The physician routinely provides updates to the exercise prescription, recommends gradual increases of intensity over weeks, and increases participation in domestic, occupational, and recreational activities. In addition, the physician includes ECG monitoring if necessary, supplements the formal exercise regimen, and prescribes home activities depending of the specific exercise program objective (Pearson et al., 2002). The exercise prescription specifies frequency (F), intensity (I), duration (D), and modalities (M). Each exercise session includes warm-up, cool-down, and flexibility movements (AACPR, 2004).

In the SMCRP, monitored physical exercise is used to enhance self-efficacy beliefs based on the patients' general self-reported physical functional capacity. Therefore, cardiac rehabilitation practitioners from the program encourage these beliefs through positive instructional and motivational interaction.

Expected outcomes. It is expected that at the end of this phase, patients have improved their physical capacity and psychosocial well-being (Baldy et al., 2000). Indicators of these improvements include written reports about the patient's functional capacity, measures of muscular endurance, strength, and flexibility, as well as increased awareness of emotional control, acquired nutritional knowledge, improvement in his or her psychological distress and social isolation, and a reduction or elimination of alcohol, tobacco, caffeine, or other non-prescribed psychoactive drugs. It is important that patients

demonstrate self-responsibility for changes in health-related behaviour, master relaxation and other stress management skills, and show ability to obtain effective social support (Baldy et al.). To keep track of these improvements, a self-monitoring daily record is kept in a progress chart. In addition, it is important that the patient regains functional independence and learns how to prevent disability (Lorig & Holman, 2003). Moreover, patients are expected to understand about weight management and diet regimens. Finally patients should have an increased their awareness about their physiological responses to physical and emotional challenges so that they begin to modify various unhealthy behaviours (Sarafino, 2006).

Appendix C: SMCRP Evaluation

Organizational Structure Evaluation

Structure-based measures help quantify the infrastructure from which the program is provided, as well as the appropriate personnel and equipment to satisfy high-quality standards of care for cardiac rehabilitation services.

With an effort to make the program more flexible and participative, the program adopted a functional structure comprising a medical director, one manager, and a multidisciplinary health team. This functional structure helps promote leadership, strong mutual relationships, a sense of participation, collaboration, information sharing, and a shared vision.

Appropriate Personnel Evaluation

Every six months, the program manager will be in charge of reviewing how the job task is divided, grouped, and coordinated. This evaluation process is done in both individual and group settings in order to avoid duplication of functions, to motivate participation, to share responsibilities, and to promote communication (Gysbers & Henderson, 2006). At the individual level, three facets of the performance evaluation include (a) self-evaluation, (b) administrative evaluation, and (c) assessment of goal attainment (Gysbers & Henderson). The self-evaluation and administrative evaluation focus on job performance competencies and each individual's level of skill and commitment. Specific behaviours of the participating individuals are observed throughout the year, documented, and compared with expected behaviours. The purpose of the assessment of goal attainment is to evaluate the health team's level of contribution to the improvement of the program, as well as their levels of effort and commitment (Gysbers

& Henderson, 2006). Evaluations fall into five areas: (a) clearly outstanding; (b) exceeding expectations; (c) satisfactory; (d) below expectations; (e) and unsatisfactory.

Equipment Evaluation

The program manager is in charge of developing a competitive advantage for the program in relation to other cardiac rehabilitation programs in Quito, Ecuador. This approach means that the program must be equipped with appropriate equipment to satisfy high-quality standards of care for cardiac rehabilitation and the necessary technology, including an information system that promotes integrative work among the medical team. In this one-year evaluation, the multidisciplinary team, in coordination with the program manager, can decide improvements in this area.

Process-Based Evaluation

In the area of process, the program evaluation consists of every activity that must be performed by the health team. To be judged as satisfactory, each activity should be effectively completed, should have a written report, and should reach expected outcomes.

An overall performance rating is a reflection of the summary of ratings from each activity, plus consideration of the rating levels. To arrive at the overall program performance rating, the rating for each activity and the related evaluation are totalled and recorded. Because these results and evaluation procedures are in the forefront of professional dialogue, it is recommended that the program's evaluation be conducted after the program is designed and yearly thereafter (Gysbers & Henderson, 2006). Some of the activities rated in this area include opportune referral, the method of data collection of medical documentation of each patient to be enrolled, complete medical, psychological, and nutritional assessment, evaluation of risk factors for adverse events

during exercise and during the whole program, patient evaluations for changes in symptoms, development of individualized risk reduction, nutritional and psychological procedures, and conditions and coordination of care with other health-care providers (Randal et al., 2007). Additionally, it is important to monitor responses and document the program's effectiveness through ongoing analysis of aggregate data.