DIABETES EDUCATION - IT'S HEART SMART

Scholarly Project for the Degree of M. S. N.

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WENDY SCHOEN MUMA

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DIABETES EDUCATION - IT'S HEART SMART

By

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ABSTRACT

By

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According to data from the National Center for Health Statistics (NCHS), major cardiovascular diseases were responsible for over 900,000 deaths in 1994, representing 42% of all deaths occuring in that year in the United States. Macrovascular disease, and particularly atherosclerosis, is the most common of all diabetic complications, accounting for 80% of all diabetic mortality and 77% of all diabetic hospitalizations.

Heart disease and diabetes consume billions of health care dollars yearly. In response to these enormous costs, preventive cardiology and rehabilitation programs are becoming increasing popular. Studies show a financial return by targeting high-risk and recently hospitalized patients and teaching them proper management of their disease and lifestyle modification and risk factor reduction. The main focus of most of these programs are low fat diets, weight reduction, exercise, smoking cessation and lipid management. Although diabetes is often mentioned as a risk factor, little emphasis is put on intensive management of diabetes and blood glucose levels, even though there is increasing evidence regarding the strong relationship between diabetes and heart disease.

The research and current practice supports the need for diabetes education to be integrated into preventive cardiology and rehabilitation programs. Advanced practice nurses can become key in developing and providing diabetes education in wellness programs such as preventive cardiology and rehabilitation, thereby providing the patient with chronic disease improved health and overall well being.

DEDICATION

This project is dedicated in loving memory of my grandfather, John T. Schoen. He passed away shortly after I graduated from Grand Valley and became a nurse. He was a true believer in education, dedication, and hard work. Without his support, emotional and financial, I may not have been able to finish my undergraduate degree.

ACKNOWLEDGMENTS

This scholarly project would not have been possible without the assistance of multiple people. First and foremost I would like to thank my committee, Louise Selanders (chairperson), Bridget Warren, and Kate Lein, for their guidance, patience, knowledge and expertise. Thanks for helping me shape this teaching module into a project I am extremely proud of.

I would also like to thank my mentor, Mary Jean Klebba. Mary Jean shared the knowledge and passion about diabetes that has helped me develop into the advanced practice nurse that I am today. Thank you Mary Jean for your continued support and encouragement on my continued education.

The staff of the cardiac rehabilitation program at Spectrum Health East has also been instrumental in the development and success of this diabetes education program. I would like to specifically thank Jeff Johnson, Jennifer Zinzer, and Joe Carlson (who is no longer with Spectrum), for their contributions and commitment.

Finally, I would like to acknowledge my family, friends and coworkers that for their continued support and patience during these past three years. Without you, I never would have made it!

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PROBLEM SIGNIFICANCE

According to data from the National Center for Health Statistics (NCHS), major cardiovascular diseases were responsible for over 900,000 deaths in 1994, representing 42% of all deaths occurring in that year in the United States (Weaver, Mueller, & Leighton, 1997). Heart disease consumes billions of dollars yearly in lost income in the United States, decreased productivity in the workplace and increased health care costs. In response to these enormous costs, an emphasis on cardiovascular wellness programs, research and prevention has become a priority.

Wellness programs, such as preventive cardiology and rehabilitation programs, are becoming increasing popular around the country. Traditionally, these programs offered only monitored exercise sessions without intensive risk factor modification intervention. In the late 1980's and early 1990's, exercise training was complemented by the addition of education and counseling for coronary risk factor modification (Miller, Warren, & Myers,1996). The main risk factors which preventive cardiology and rehabilitation programs focus on are low fat diets, weight loss, exercise, smoking cessation and lipid management (Weaver, Mueller, & Leighton, 1997). Although diabetes is often mentioned as a risk factor, little emphasis is put on intensive management of diabetes and blood glucose levels, even though there is overwhelming evidence regarding the strong relationship between diabetes and heart disease (Weaver, Mueller, & Leighton, 1997)

Diabetes is one of the most common chronic diseases in developed countries today. Data from the National Health Interview Survey 1991-1993 revealed that approximately 3% of people in the United States knew they had diabetes in 1991-1993 (Harris, 1995). However,

measurement of blood glucose concentrations in a representative sample of people without known diabetes in the National Health and Nutrition Examination Survey II revealed that there was approximately one case of undiagnosed diabetes in the country for every diagnosed case (Buchanan & Davidson, 1997). Latest estimates of people with diabetes in the United States is 15 -16 million, or about 1 in 17 or 18 people (Harris, 1995). Prevalence rates of known diabetes in the United States have increased almost seven fold since the 1950's.

More than 90% of all people with diabetes have Type 2 diabetes. Formerly known as non-insulin-dependant diabetes mellitus or adult onset diabetes, Type 2 diabetes is caused initially by insulin resistance and hyperinsulinemia eventually leading to relative or absolute insulin deficiency (DeFronzo, 1998). Risk factors in the development of Type 2 diabetes include a strong genetic disposition, onset later in life, obesity, particularly with intra-abdominal fat distribution, and sedentary lifestyles (DeFronzo, 1998).

A study by Olefsky (1997) has shown that, even in the absence of diagnosed Type 2 diabetes, insulin resistance/hyperinsulinemia can have important adverse health consequences. Insulin resistance/ hyperinsulinemia (often called Syndrome X, or the insulin resistance syndrome) can be etiologically important in causing certain forms of hypertension as well as dyslipidemia, both of which can contribute to the development of CVD. The current view of Syndrome X is that it is an extremely common metabolic abnormality present in 50 to 75 million Americans (Olefsky, 1997). Type 2 diabetes will develop in a certain proportion of these subjects, usually at a rate of 3%to 8% per year (Reaven et al,1994). Even for those who do not progress to Beta cell failure and Type 2 diabetes, hypertension, dyslipidemia, and CVD are

frequently observed.

Macrovascular disease, and particularly atherosclerosis, is the most important of all chronic diabetic complications and accounts for about 80% of total diabetic mortality (Garber,1994). Seventy-five percent of that mortality occurs as the result of markedly accelerated coronary artery disease (Garber,1994). As a consequence, 77% of all hospitalizations for diabetic complications are accounted for by the general category of coronary atherosclerosis (Garber, 1994). Although diabetes itself can accelerate atherosclerosis by 200-400%, diabetic patients often have multiple risk factors for coronary disease (Garber, 1994). Although many of these risk factors are covariates of Type 2 diabetes, including hypertension, hyperlipidemia, and obesity, Type 2 diabetes is an independent risk factor of cardiovascular disease and in proportion to the duration of diabetes. (Sobel, 1997).

The economic impact of caring for the health care problems of people with diabetes is alarming. These costs account for about15% of all US health care dollars and 27% of all Medicare expenditures (Rubin & Altman, 1994). Approximately half of these costs are for treatment of specific diabetes problems and most of it is to treat the continual problems of advanced diabetes complications. Buchanan & Davidson (1997) state that, "societal (indirect) costs from advanced diabetes complications are considerable, estimated at $8.4 billion annually from lost productivity, $11.2 billion from long-term disability and rehabilitation, and $27 billion from premature death".

These statistics reveal that diabetes, in general, and Type 2, in particular, are associated with very serious morbidity, increased mortality and tremendous economic impact. There is now evidence that many long term complications, in particular cardiovascular, can be

prevented by good clinical care, early detection and treatment, and careful monitoring. The cornerstone of prevention of macrovascular disease is aggressive intervention to favorably modify well-established risk factors including hyperlipidemia, hypertension, obesity, hyperglycemia and smoking (Sobel, 1997). Target blood pressure with treatment should be < 135/85 mm Hg throughout the day. The NCEP-ATP II Guidelines for hyperlipidemia should be followed and aggressive treatment instituted in persons with Type 2 diabetes. The greatest opportunity to deliver such preventive services lies in the hands of primary care providers, such as nurse practitioners, who care for a large majority of people (> 90%) with Type 2 diabetes in the United States (Buchanan and Davidson,1997).

The shift in the delivery of health care services from fee for service to managed and capitated plans has indirectly given providers incentive to render better and more cost-effective ways to treat chronic diseases. Clinical studies support intensive risk factor modification as a method to lower morbidity and mortality in cardiac and diabetic patients (Miller, Warren, & Myers, 1996). Health care delivery systems are now developing innovative methods to provide preventive care, early detection, and treatment as well as to maximize resources to lower overall health care costs. Studies show a financial return by targeting high-risk/recently hospitalized patients and teaching them proper management of their disease, adopting a healthy lifestyle, and the use of medical resources appropriately (Miller, Warren, & Myers, 1996, p. 76). Cardiac rehabilitation and diabetes education are examples of secondary and tertiary prevention programs that targets these high risk patients who are costly to the health care system.

As health care systems focus an increasing amounts of attention to

cost savings in the next decade, the emphasis for treatment of coronary artery disease (CAD) and diabetes must include stronger initiatives for primary and secondary prevention of CAD and diabetes. Although it has been previously thought that CAD was an inevitably progressive disease, evidence now shows that disease progression can be delayed and even reversed through intensive risk factor modification and blood glucose management.

STATEMENT OF PROBLEM

The background and current practice information supports the belief that there is a need for diabetes education to be integrated into preventive cardiology and rehabilitation programs. Therefore, the goal of this scholarly project is to develop a two hour education course for Type 2 diabetic patients in a cardiac rehabilitation program. The course will be designed and taught by a nurse practitioner. The many roles that require an advanced practice nurse include educator, collaborator (with primary care providers and cardiac rehabilitation staff), coordinator, researcher and change agent (Hamric & Spross, 1989). Based on the existing literature and using The Health Belief Model, developed by Becker and modified by the author, as a conceptual framework, a teaching module will be developed for diabetes management within the context of a cardiac rehabilitation program.

Conceptual Definitions

The following conceptual definitions are considered essential to the course on diabetes and heart disease. The review of literature makes frequent reference to the following terms:

TYPE 2 DIABETES: It was formerly known as adult onset or non-insulin dependent diabetes. It usually develops after 40 years of age, with or without classic symptoms. The person is not dependent on insulin injections to sustain life but may be treated with insulin for better control. The endogenous insulin levels associated with this disease may be mildly depressed, normal, or elevated coupled with tissue insensitivity to insulin. Contributing factors to the development of Type 2 diabetes are: family history of Type 2 diabetes, obesity, sedentary lifestyle,age, and ethnicity. (Phipps, Long, Woods, & Cassmeyer, 1992)

SYNDROME X: Is a condition in which insulin resistance, hyperinsulinemia, hyperglycemia, upper body obesity, hypertension, and lipid abnormalities occur with surprising frequency in the same individual. (Vinicor, 1996)

MACROVASCULAR DISEASE: Defined as disorders of large vessels with resultant morbidity and mortality. Pathologically, macrovascular disease in diabetes mellitus reflects atherosclerosis, which is the deposit of material (ie. lipids) within the inner layer- the intima- of vessel walls. (Vinicor, 1996).

Conceptual Framework

The model chosen for this project is The Health Belief Model as modified by Becker, see figure 1 (Glanz, Lewis, & Rimer, 1990). This model was developed in an attempt to predict when people will engage in preventive behaviors. The Health Belief Model looks at behavior change

and is a type of individual health promotion model. Individual health promotion models are based on the premise that success depends on an individual's willingness to undertake and maintain the new behaviors (Murdaugh & Vanderboom,1997). The primary outcome of interest is individual behavior. These models were originally developed by health care providers to help individuals modify or replace high-risk behaviors with healthy ones. Individual models concentrate on what people can do for themselves. They focus on attitudes, beliefs, or other characteristics within the individual that can be changed.

The principle intervention in an individual-oriented model is education. In terms of this project, the aim is to provide information about consequences of diabetes risk factors in terms of morbidity and mortality for adult clients with cardiovascular disease (Murdaugh & Vanderboom, 1997). The education will provide the participant with direction and promote the development of strategies that support and promote behavior change.

The four core dimensions of the Health Belief Model that are proposed as directly affecting predisposition to behavior change are:

Perceived Susceptibility: Refers to one's subjective perception of the risk of contracting a health condition. In the case of medically established illness, the dimension has been reformulated to include acceptance of the diagnosis, personal estimates of resusceptibility, and susceptibility to illness in general.

Perceived Severity: Feelings concerning the seriousness of contracting an illness or of leaving it untreated include evaluations of both medical and clinical consequences and possible consequences.

Perceived Benefits: While acceptance of personal susceptibility to a condition also believed to be serious is held to produce a force leading

to behavior, it does not define the particular course of action that is likely to be taken. This is hypothesized to depend upon beliefs regarding the effectiveness of the various available actions in reducing the disease threat, or the perceived benefits of taking health action. Thus, an individual exhibiting an optimal level of beliefs in susceptibility and severity would not be expected to accept any recommended health action unless that action was perceived as feasible and efficacious

Perceived Barriers: The potential negative aspects of a particular health action, or perceived barriers, may act as impediments to undertaking the recommended behavior. A kind of benefit analysis is thought to occur where an individual weighs an actions effectiveness against perceptions that it may be expensive, dangerous, unpleasant, inconvenient, time-consuming, etc. (Glanz, Lewis, & Rimer, 1990, p.43-44)

Modifying factors such as demographic, sociopsychologic, and structural variables, as well as cues to action, only indirectly affect action tendencies through their relationship with perception of threat (susceptibility and seriousness).

In 1988, Rosenstock et al proposed that self efficacy be added to the Health Belief Model as an explanatory variable and suggested that it be incorporated in interventions based on this model. For behavior change to succeed, people must feel threatened by their current behavioral patterns (susceptibility and seriousness) and believe that change of a specific kind will be beneficial by resulting in a valued outcome at acceptable cost. But they must also feel they are competent to implement the change (Glanz et al, 1990).

The model proposed for this project see figure 2, incorporates the

concept of self efficacy into The Health Belief Model. Individual perceptions of the cardiac rehabilitation participant with Type 2 diabetes will vary in the degree in which they perceive how their diabetes control will effect the recovery and potential resusceptibility of their heart disease. Participants will come to class with set of modifying factors that are individual to each class member. Modifying factors include such things as demographic variables (age, sex, race), sociopsychologic variables (personality, social class, economic status), structural variables (knowledge about their disease, prior contact or experience with others with heart disease and diabetes) and cues to action (primary care provider's encouragement/attitude toward disease and lifestyle modification, mass media, advise from other health care workers). The most influential of these being the structural knowledge of the participant and cues to action, mainly primary care provider's influence. One of the strongest indicators that a patient will take the recommended action is the physician or primary care provider's attitude toward the particular action. All of the individual's perceptions and modifying factors influence the individual's perceived threat of uncontrolled diabetes on recurrent CAD.

The aim of this project is that by educating participants on the high risks associated with poor diabetes control in relationship to heart health, participants will be more likely to take action to control their diabetes. Through the process of completing the education session, the goal will be that each participant will have a better understanding of the seriousness of diabetes and the benefits of good management in relationship to their heart health. Murdaugh & Vanderboom, 1997 stated,

From a cardiovascular perspective, the model theorizes that

> individuals are more likely to engage in risk-reducing behaviors if they believe they are highly susceptible to cardiovascular disease, the disease will have serious effects, their actions or behaviors will reduce the susceptibility or severity, and the benefits of taking action or making change outweigh the costs or disadvantages of doing nothing. (p. 6)

Since the individual with diabetes is responsible for over 95% of the disease management and care, it will be the instructor's responsibility to educate on the tools necessary for proper management. For those who are ready for and feel the need for more instruction and help in understanding the many aspects of good diabetes management, the individual will be enrolled in the properly needed comprehensive outpatient diabetes education classes.

Figure 1 - The Health Belief Model, Becker et al., Glanz, Lewis, & Rimer 1990, p. 40.

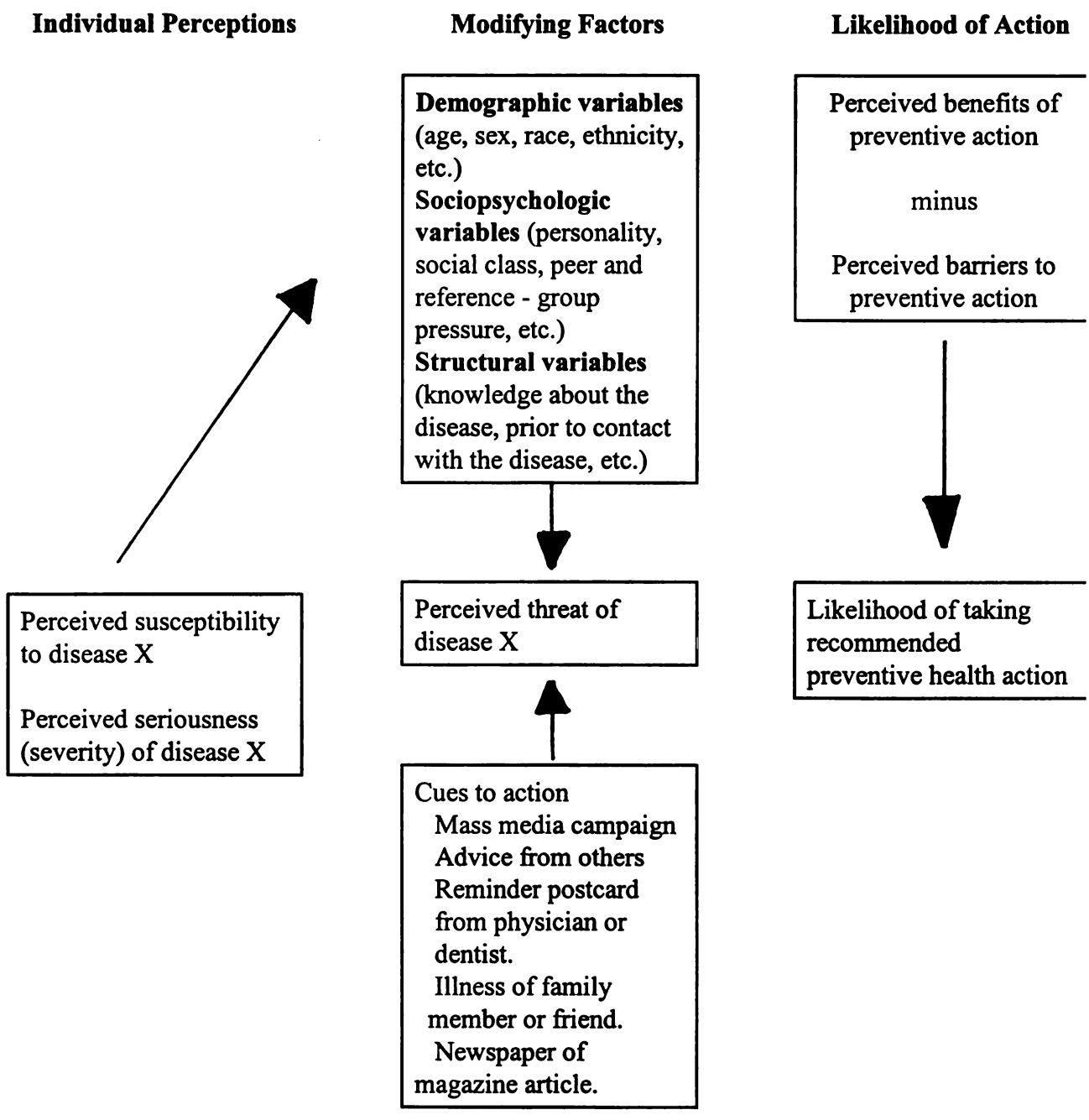
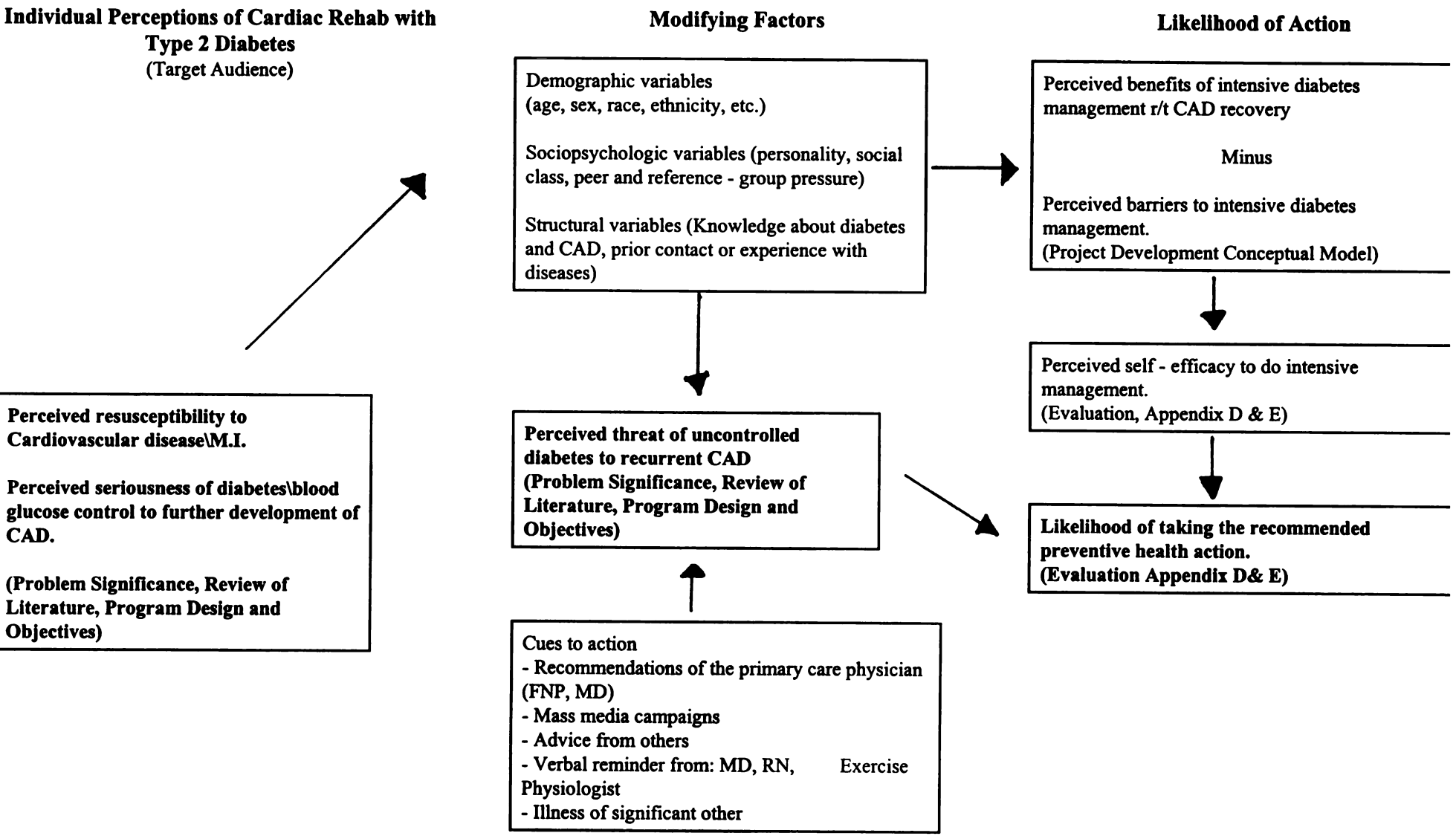


Figure 2 - The Health Belief Model from Becker et al - modified to include self efficacy and to reflect diabetes education program.



REVIEW OF LITERATURE

Diabetes and Heart Disease

The Diabetes Control and Complications Trial (DCCT) in Type 1 diabetic patients, which was completed and reported in September 1993, is a milestone in the field of diabetes management. The results of this long term study conclusively demonstrate that glycemic control is a major determinant of the development and progression of diabetic microvascular and neuropathic disease (Lebovitz, 1994). These findings were repeated in a smaller scale study in Kumamoto, Japan, with Type 2 patients on insulin.

The Framingham Study was the first major large-scale study that helped define the cardiovascular risk in the diabetic population. This study showed that the major clinical manifestations of coronary disease increased in diabetics, particularly in females. The impact of diabetes on coronary disease was greater in the presence of other risk factors. However, even when these factors were taken into account, an independent influence of diabetes on coronary artery disease was still observed (Dawber, 1980).

Many factors contribute to the development of macrovascular disease in persons with Type 2 diabetes. Most of these appear to be related to the insulin resistance and hyperinsulinemia that can be seen for years in patients developing and manifesting Type 2 diabetes before Beta Cell exhaustion has occurred (Sebol, 1997). These include hypertriglyceridemia, hypertension, obesity and the potentially adverse effects of hyperinsulinemia on the vessel walls. Modest hypercholesterolemia and altered coagulation, platelet function, and fibrinolysis appear to all associated with hyperinsulinemia and hyperglycemia (Sobel, 1997). Hyperinsulinemia is considered to be a

significant, independent risk factor for cardiovascular disease (CVD) (Reaven, Lithell, & Landsberg, 1994).

The Multiple Risk Factor Intervention Trial (MRFIT) data showed that the mortality rate for coronary heart disease (CHD) increases exponentially as a function of serum cholesterol levels in diabetics just as it does in non diabetics. For every cholesterol level diabetics have a threefold to fivefold higher CHD mortality rate (Bierman, 1992). The Nurses' Health Study shows the same phenomenon in women. In this study, diabetic women had about a fivefold increase in CHD incidence rate, regardless of the cholesterol level (Bierman, 1992).

In three large population studies from around the world (Helsinki, Paris, and Busselton, Australia), high insulin levels have been shown to be associated with increased incidence and mortality rates of CHD (Bierman, 1992). The Paris Prospective Study showed that the annual CHD mortality rate is significantly higher in those healthy individuals who had fasting plasma insulin levels in the highest quintile (Fontbonne et al, 1991).

According to the sixth report from the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (November,1997), the risk of cardiovascular disease in patients with hypertension is determined not only by the level of blood pressure but also by the presence or absence of target organ damage or other risk factors such as smoking, dyslipidemia and diabetes mellitus. These factors independently modify the risk for subsequent cardiovascular disease, and their presence or absence should be determined during evaluation of patients with hypertension. It is the clinical opinion of the JNC VI executive committee that patients who have high normal blood pressure as well as renal insufficiency, heart failure or diabetes mellitus

should be classified in risk stratification group C and treated promptly and aggressively with pharmacologic therapy and lifestyle modification.

The United Kingdom Prospective Diabetes Study (UKPDS) recently released the findings of their 20 year study. The UKPDS has shown that in the aggregate, intensive therapy improves health-care status (with regards to retinopathy, neuropathy, and nephropathy), thus providing important support for the glucose hypothesis, established by the DCCT for Type 1 diabetics and suggested by the Kumamoto study of intensive insulin therapy in Type 2 diabetes (Nathan, 1998). The UKPDS did not unequivocally show whether an intensive strategy influences cardiovascular disease, a question that some researchers feel was unlikely to be answered due to the multi factorial nature of cardiovascular disease in Type 2 diabetes (Nathan, 1998). However, it did show a decrease in cardiovascular disease with intensive treatment of Metformin as well as with intensive blood pressure treatment combined with blood glucose control (Nathan, 1998). The study, despite the median of 10 years' follow up is still short compared with the median life expectancy of 20 years in the UKPDS patients diagnosed at the median age of 53. To investigate longer term responses, post monitoring for 5 years will go on to establish whether the improvement of glucose levels achieved will substantially decrease the risk of fatal and non-fatal myocardial infarctions with longer follow up (UKPDS Group, 1998).

Efficacy of Cardiac Rehabilitation Programs

The World Health Organization Expert Committee in 1993 stated that comprehensive cardiac rehabilitation is the multifaceted process of prescription exercise training combined with an active program of coronary risk factor modification in patients with established heart disease. The goals are to improve functional capacity, alleviate or lessen

activity related symptoms, reduce invalidism, and identify and modify coronary risk factors to reduce subsequent morbidity and mortality due to cardiovascular illness. The ultimate goal is to restore and maintain the individual at his or her optimal physiological, psychological, social and vocational status (Allen & Redman, 1996).

Studies have documented that cardiac rehabilitation reduces mortality, cardiac rehospitalization, and overall medical costs (Ades, Huang, &Weaver, 1992; Levin, Perk, & Hedback, 1991). Currently, only 15% of all patients eligible for cardiac rehabilitation services enroll in formal cardiac rehabilitation programs and some studies show that older adults enroll at a significantly lower rate (Allen & Redman, 1996). Learning to cope with heart disease and learning to manage lifestyle behaviors are majors needs for all cardiac patients (Allen & Redman, 1996).

Cardiac rehabilitation programs that consist of prescriptive exercise training and modification of risk factors following coronary events have been shown to reduce cardiovascular mortality, improve functional capacity, and slow the progression and promote the reversal of coronary atherosclerosis (Allen & Redman, 1996). Although it is generally assumed that the benefits of these programs are similar for all adult age groups, it is important to note that many of these studies were done with populations of cardiac patients that included very few or no elderly (greater than 65) patients.

Evidence of the benefits of exercise and risk factor modification among elderly patients with cardiac disease is starting to emerge. Significant improvement in quality of life in patients enrolled in cardiac rehabilitation programs have been reported. Coronary risk factor reduction, results in both increased survival and decreased morbidity in

coronary patients (Allen & Redman,1996).

There are no available studies on diabetes education as a part of the comprehensive cardiac rehabilitation program. From peers and educators with whom this author has spoken to around the area and outside the state of Michigan, most programs do not have anything comparable. Studies are mixed on whether diabetes education effects outcomes, unfortunately, outcome research in the area of diabetes education has only recently become emphasized. Studies have shown positive and no real changes in relationship to outcomes and most have enough limitations that results can not be generalized. There are studies currently being conducted by the Diabetes Outreach Networks in Michigan, as well as by Robert Anderson and Marti Funnell of the University of Michigan.

Health Belief Model

The Health Belief Model has become a popular conceptual framework in nursing, especially in studies focusing on patient compliance and preventive health care practices. In reviewing 10 years of studies related to the model, Janz and Becker concluded that results of numerous studies, both retrospective and prospective, show perceived barriers to be the most powerful of the Health Belief Model dimensions in explaining or predicting various health behaviors (Pender, 1996). Perceived suspectibility was also important in understanding preventive behaviors. Both perceived benefits of taking action and perceived seriousness of disease lacked power to explain or predict health-protecting behavior.

Nurse researchers have used the Health Belief Model in connection with studies of women's practice of breast self-examination, women's decisions regarding estrogen replacement therapy, immunizations, obesity, and gender differences in leisure-time physical exercise. It's use

in cardiac rehabilitation is limited. It's use in diabetes education is more common, especially with foot care and self monitoring of blood glucose levels.

SUMMARY

Even though the UKPDS results provided some answers, it's results are considered controversial by some researchers partially because it's design required a stepwise additive therapy that may have obscured differences and partially because of the multiple intervening variables involved in the Type 2 diabetes with regards to heart disease (Nathan, 1998). There appears to be more than enough data and research backing the control of blood glucose levels in correlation to control of cardiovascular risk factors in decreasing overall incidence of cardiovascular complications and death. The efficacy of cardiovascular rehabilitation programs strongly supports education on modification of risk factors for heart disease. The Health Belief Model has been used in nursing research for years and definitely has been proven a valid model for behavior modification education.

PROJECT DEVELOPMENT

Diabetes education for cardiac rehabilitation participants was first identified as a need by a group of staff from the diabetes education and preventive cardiology and rehabilitation department at Blodgett Memorial Medical Center. Multiple group meetings were held to discuss the course and course content. The group consists of both department managers, a nurse educator from each department, the cardiac rehabilitation department dietitian, and a local endocrinologist/diabetes specialist.

First, a needs assessment of the cardiac patient was done by informal interviews with random diabetic clients conducted while they were in their exercise session (qualitative research). Areas of interest identified were exercise guidelines and the relationship of heart disease to diabetes. Two classes were offered at a six week interval at Blodgett Memorial Medical Center. The class was open to any cardiac rehabilitation patient and their significant others. A questionnaire (Appendix A) was distributed to all participants to identify potential areas of need, as well as provide data for the instructor on characteristics of the target population (quantitative research). The data collected from the participants supplied the instructor with the **modifying factors or variables** (demographic, sociopsychologic, and structural) of each individual. Data collected also identified the following areas of need: regular self monitoring of blood glucose levels, meal planning, and a basic understanding of diabetes (**preceived threat of uncontrolled diabetes**). (Appendix B)

Based on these results, the class was altered to spend more time on the importance of monitoring and the need for controlled blood sugars for overall heart health. A basic session on carbohydrate counting was also added to the session. Classes continued to be offered at six week

intervals for the next four months using the same needs assessment questionnaire. Data collected from these four classes showed the similar results (Appendix B).

The needs assessment questionnaire was developed (Appendix D). It is a written questionnaire and checklist assessing areas of interest by the potential participant, practices in the major areas of management of diabetes (**preceived seriousness and threat of uncontrolled diabetes**) - monitoring, meal planning, medications, and exercise, and the best time to offer the class. This questionnaire will be distributed by the Cardiac Exercise Physiologist and/or nurse to ***all*** class members with diabetes in their monitored exercise session. Distribution will take place for a month then repeated every three months to continually assess and monitor the needs of the client. Participants will be asked to complete the questionnaire and return it during class or drop off at the cardiac rehabilitation office. Completion of the questionnaire will be strongly encouraged, but not mandatory.

Pilot materials (Appendix C) were developed and are distributed to class members at the end of class. The handouts contain the majority of information that is taught during the class. The areas of focus are the **seriousness of uncontrolled diabetes** on heart disease and the **benefits** of good diabetes management in relationship to heart health. These handouts are distributed at the end of class in order to facilitate group discussion and participation during class. The instructor acts more like a facilitator for group learning, since evidence does support this type of teaching/ learning for the adult learner. Through group discussion, of how to obtain and maintain good control, the instructor can assess for potential **perceived barriers** participants may have to taking action. The instructor may also be able to assess whether individual participants

may feel unable to do the recommended action (**self-efficacy**). The open format of the class not only unables the instructor to discuss ways of overcoming barriers and simplify the recommended actions, but the participants themselves may be able to help each other through the sharing of personal experiences.

There is increasing evidence in rehabilitation that teaching groups of patients with similar health problems helps them reach their greatest potential (Payne, 1995). Because many clients with a chronic disease or disability are adults, consideration of how adults learn is appropriate. Group learning has a long history in adult education, beginning more than 200 years ago with Benjamin Franklin's study discussion group called the Junto (Payne, 1995). Educators of adults have identified small group discussion as an appropriate method for education the age group as it ensures their active participation, sharing of experiences, and learning from each other. Group discussion has been identified as the method of adult education that is most satisfying to participants and that provides a sense of belonging and an opportunity for fellowship (Payne, 1995).

Knowles (1980) described group learning as drawing on richer resources and motivations than individual learning (Payne, 1995). Brookfield (1986) viewed the resource of adult experiences for learning and the sharing of those experiences in a group setting as one of the most significant forms of adult learning in which individuals can engage. Adult learning in a group setting often helps motivate individuals and provide a stimulus for change (Payne, 1995). Studies have been conducted in both the cardiac rehabilitation and diabetes education settings with positive results (Payne, 1995).

TARGET AUDIENCE

The original target group was all cardiac rehabilitation participants and their significant others with diabetes or interested in learning about the relationship of diabetes and heart disease. However, since the implementation of this program, the preventive cardiology and rehabilitation department is trying to increase marketing to primary care providers. The rationale is prevention of heart disease by referring patients with diabetes, but not necessarily established heart disease, to the program for a GXT stress test, exercise prescription, and lifestyle modification courses. The majority of cardiac rehabilitation programs are used for secondary and tertiary prevention, another words, post cardiac event or disease. The goal is to be able to expand the program and the gym hours available to promote more primary preventive use. The cost savings associated with improving not only the patient's diabetes status, but also the risk reduction for heart disease, would be enormous.

PROGRAM DESIGN/OBJECTIVES

GOAL: Improve overall cardiac health and reduce morbidity and mortality associated with diabetic cardiac rehabilitation patients through education on diabetes management.

MACRO OBJECTIVE:

Participants will demonstrate the importance of diabetes management in relationship to cardiac health status by writing a plan of action at the end of class with at least one goal and behavior change they plan to make to improve their diabetes management.

MICRO OBJECTIVE 1.0:

Participants will demonstrate an understanding of the increased risk of macrovascular disease in persons with diabetes.

1.1 - Participants will identify the major complication of diabetes - macrovascular disease.

1.2 - Participants will identify the role of insulin resistance in the development of heart disease.

1.3 - Participants will verbalize the relationship between hyperglycemia and lipid levels in the blood stream.

1.4 - Participants will visualize what high levels of blood glucose in the blood stream and verbalize how this is a risk factor for all diabetic complications, including heart disease.

1.5 - Participants will identify the multiple overlapping risk factors for the development of Type 2 diabetes and heart disease.

LEARNING EXPERIENCES FOR MICRO OBJECTIVE 1.0

Lecture with group discussion on the Pathophysiology and development of Type 1 and Type 2 diabetes, with emphasis on heart disease risk factors and precursors (such as insulin resistance/ hyperinsulinemia).

Handouts with outline of lecture for participant to be able to keep in their cardiac rehab binder to review later if necessary.

"Blood bags" that show what elevated blood glucose levels look and feel like.

Overheads with charts showing graphs of the prevalence of heart disease complications and hospitalizations of diabetes.

MICRO OBJECTIVE 2.0:

Participants will discuss the importance of monitoring blood glucose levels and laboratory results for good diabetes management and heart health.

2.1 - Participant will verbalize the importance of regular self blood glucose monitoring and identify an appropriate schedule for testing.

2.2 - Patient will verbalize normal blood glucose ranges.

2.3 - Patient will describe the hemoglobin A1C test and how often it should be done by physician.

2.4 - Patient will verbalize the NCEP guidelines for total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides.

LEARNING EXPERIENCES FOR MICRO OBJECTIVE 2.0

Lecture with class discussion.

Handouts with normal glucose ranges and lab values for cardiac rehab folder.

Demonstration of hemoglobin A1C with a model.

Finger stick blood glucose done on One Touch machine before class.

Make coupons available for meter purchase if wanted.

MICRO OBJECTIVE 3.0:

Participants will identify the guidelines for safe exercise in persons with diabetes.

3.1 - Participants will discuss how exercise effects blood glucose levels.

3.2 - Participants will discuss the increased risk hypoglycemia and in some cases, hyperglycemia with exercise.

3.3 - Participants will verbalize what to do if they have hypoglycemia or hyperglycemia before, during, and after exercise.

3.4 - Participants will identify the safest times to exercise.

3.5 - Participants will verbalize the importance of monitoring before and after exercise.

3.6 - Patients will verbalize how medications can affect exercise. (Diabetes agents, insulin injections, and beta blockers)

LEARNING EXPERIENCES FOR MICRO OBJECTIVE 3.0

Lecture with group discussion.

Handouts for cardiac rehab binder.

Case Study examples on Overheads

Have all Cardiac Rehab instructors test all participants with diabetes before and after exercise.

MICRO OBJECTIVE 4.0:

Participants will demonstrate an understanding of basic carbohydrate counting.

4.1 - Participants will verbalize how carbohydrates, proteins, and fats effect blood glucose levels.

4.2 - Participants will identify foods that are in the carbohydrate group (grains/starches, fruit, and milk).

4.3 - Participants will verbalize an understanding of the importance of consistent amounts and times of carbohydrates and meals.

LEARNING EXPERIENCES FOR MICRO OBJECTIVE 4.0

Lecture with group discussion of carbohydrate counting.

Plastic models of foods and portion sizes.

Examples of how to carb count a sample meal.

Option of further education - 1:1 appointment with Registered Dietitian for individual meal plan development.

EVALUATION (Appendix E)

Program evaluation will take place at several different levels. This program has a set of short term, as well as long term goals to be evaluated. Short terms goals of this program are increased knowledge on the relationship of diabetes and heart disease, acceptance, and increased self-efficacy in the abilities needed to obtain good management of diabetes. The short term goals can be seen immediately after participation in the program and will influence the success of the long term goals. The long term goal of decreased morbidity and mortality, and overall quality of life will be evaluated by qualitative and quantative reasearch.

Initial evaluation by the nurse practitioner instructing will be by beginning the class with brief introductions by particicpants and the sharing of their feelings and/or thoughts on their diabetes and heart disease. Evaluation at following the class will involve the participant

MICRO OBJECTIVE 4.0:

Participants will demonstrate an understanding of basic carbohydrate counting.

4.1 - Participants will verbalize how carbohydrates, proteins, and fats effect blood glucose levels.

4.2 - Participants will identify foods that are in the carbohydrate group (grains/starches, fruit, and milk).

4.3 - Participants will verbalize an understanding of the importance of consistent amounts and times of carbohydrates and meals.

LEARNING EXPERIENCES FOR MICRO OBJECTIVE 4.0

Lecture with group discussion of carbohydrate counting.

Plastic models of foods and portion sizes.

Examples of how to carb count a sample meal.

Option of further education - 1:1 appointment with Registered Dietitian for individual meal plan development.

EVALUATION (Appendix E)

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Initial evaluation by the nurse practitioner instructing will be by beginning the class with brief introductions by particicpants and the sharing of their feelings and/or thoughts on their diabetes and heart disease. Evaluation at following the class will involve the participant

using to information received and completing a plan of action listing at least one goal and behavior change they wish to make regarding their diabetes management. These goals will then be sent back to them in three months and at one year after completion of the course, asking them to rank (using a Likert scale) how they feel they are doing on their goal and behavior change. Even if participants make some progress toward the goals, it will be a positive evaluation of the program. Since according to Prochaska, the movement from Precontemplation to Action can take up to six months to a year, some movement toward the goal should be considered a positive.

The needs assessment is an ongoing evaluation process, where participants will be asked to complete a questionnaire. These questionnaires will be distributed every four months. Evaluation of these questionnaires will assure that the program is continuing to meet the needs and interests of the target population.

Another form of evaluation will be a one time case design. It will involve the completion of a evaluation on the micro objectives and whether they have been accomplished. It will also include a section for comments for future improvement.

The last form of evaluation that could be used is the analysis of potential research on program outcomes. It will be the Program Developer's responsibility to take these evaluations and make improvements in the program if necessary, but to also show the importance of keeping the program to the hospitals managers, directors, and physicians of the cardiac rehabilitation program.

IMPLICATIONS FOR RESEARCH

Since the long term goal of this program is to improve overall cardiac health through education on diabetes, research implications would focus

on outcome data. The main type of research that would prove outcomes the best would be forms of quantitative research. One of the most effective and objective ways of evaluating the long term goal is through the monitoring hemoglobin A1C levels. A hemoglobin A1c would be drawn prior to participation in the class, and at intervals after completion of the class. To prove the effectiveness of the education class, comparison of hemoglobin A1C levels with a cohort of patients that have not participated in the program. To further document effectiveness of the program, as well as researching the reduction in post myocardial complication rate of patients with controlled diabetes, patients in both cohorts would need to be followed up on a long term basis with hemoglobin A1c levels and monitoring for evidence of complications. This could be done by periodic interviews with patients, along with small focused physical exam by the nurse practitioner, monitoring for evidence of complications.

Pretest/ post-test is another form that could be used for quantitative research to measure the short term goal of increased knowledge about the risks associated with diabetes and heart disease. A pretest could be given to a random group of cardiac rehabilitation participants with diabetes upon entry interview into the overall program. The same group could be given the test at the exit interview from the program and comparisons made between those that took advantage of the diabetes education course.

Questionnaires/surveys mailed out to clients post course at different intervals to evaluate goal/behavior changes made by the patient along with any signs of cardiac complications. Quantitative reasearch combined with qualitative research would effective in measureing the achievement of the short term goal of increasing self efficacy of the

participant. The quantitative piece would have the participant rate, using the Likert scale, how they are progressing toward their behaivor change goals. Open ended question interviews done after participation in the course may be effective in evaluating the content of the course and how it is taught, as well as giving the researcher a better view of the patients overall feelings in terms of their perceived self efficacy in managing their diabetes. Since the class session opens with a brief participant introduction and discussion on their feelings regarding their diabetes, it could give a starting place for comparison, preclass and after completion of the class. It also may give the instructor a better understanding of the target population and their needs.

IMPLICATIONS FOR THE ADVANCED PRACTICE NURSE

The challenge for clinicians caring for individuals with chronic disease includes the implementation of interventions designed to motivate the initiation of risk modification efforts and to facilitate behavior change. The advanced practice nurse in the primary care setting can use this program in multiple ways to improve client health and well being. Even though many education and rehabilitation programs exist, they are often under utilized by most primary care providers. Studies have shown that participation in programs such as cardiac rehabilitation and diabetes education is greatly increased when the primary care provider's recommendation is perceived by the patient as strongly recommended vs. moderately supportive or absent (Allen & Redman, 1996).

Through the use of preventive rehabilitation and risk factor modification programs such as this one, the advanced practice nurse uses a variety of roles. They include, but are not limited to the following roles:

Clinician/Practitioner- promoting self-care abilities, maintaining health, and preventing complications of chronic disease.

Change Agent - collaborating and coordinating activities to bring positive alterations in an individual's health behaviors.

Collaborator - exchanges information and participates in client care or problem management with other members of the health care team to achieve joint responsibility and accountability for planning for decisions made regarding a client needs and outcomes.

Coordinator- facilitates the identification of health needs and the implementation of the therapeutic plan in health care delivery systems as a member of a team of health care professionals.

Educator - teach and assist clients in identifying and meeting their health educational needs. (Hamric & Spross, 1989)

The role of the case manager by the nurse practitioner would prove highly effective in this situation. The program could provide a clear delineation of responsibilities based on the complexity of patient interventions that are required for good overall management of the patient's health. The nurse practitioner could manage the patient's diabetes and other coronary risk factors, work in collaboration with the cardiologist to manage the complex cardiac care, as well as working in collaboration with the primary care provider on the aspects of care that my arise during the cardiac rehabilitation program. Many times patients feel overwhelmed by all the physicians that become involved in their care, therefore, it would be highly beneficial for the patient to have someone that is coordinating all the aspects of care, so that the patient can focus on recovery.

CONCLUSION

Advanced practice nurses and other health care professionals have a responsibility to provide appropriate and effective services to all patients, regardless of age, gender, and ethnicity. The present systems of care are not effectively help many cardiac and diabetic patients reach the level of rehabilitation and education that would improve their overall health status. Advanced practice nurses can become key in providing leadership in the use of preventive cardiology and rehabilitation and diabetes education services.

APPENDIX A

Questionnaire

Appendix A

Cardiac Rehab Questionnaire

1.) Name:_____ Age:_____
Regular Physician:_____
How often do you see him/her for your diabetes in a year?
_____

2.) What type of diabetes do you have? Type I or Type II
When were you diagnosed with diabetes? _____

3.) Medication taken for diabetes? Oral or Insulin
Name:_____
Dosage:_____
When do you take it? Morning, Noon, Dinner, Bedtime
Before meal (15-30 minutes)
With the meal
After meal

4.) Do you monitor your blood sugars? yes or no
How often?_____

5.) Do you follow a meal plan? yes or no
Recommended calories_____
Ever seen a dietitian 1:1 for a meal plan? _____
What do you weigh?_____
How much would you like to weigh?_____
Recent gain or loss of weight?_____
What is the most troublesome part of your diabetes meal plan?
_____
_____
_____

6.) Have you taken diabetes education classes in the past? yes or no
How long ago?_____

To be filled out after class

1.) Did you find this class beneficial? yes or no
Comments:_____

_____

_____

2.) Would you be interested in enrolling in the Comprehensive Ambulatory Diabetes Control and Education Program offered through Blodgett?
Yes or No

If yes, please include a daytime phone number, we will follow up with you.
Phone number:_____

Thanks for your participation!

Appendix B

Questionnaire Results - Pilot Classes

Appendix B

Results of the First 2 Diabetes Classes:

Participants:

Type I diabetes -	0
Type II diabetes -	16
Participants without diabetes -	6

Medication regimen:

Diet/Exercise only -	2
Oral medication/all types -	8
Insulin requiring -	6
Combination therapy -	0

Monitoring regimen:

None -	2
2 -4 times a week -	7
Once a day -	4
Twice or three times a day -	3
Four times a day -	0

Attended previous diabetes education program:

yes -	8
no -	8

** Most of the participants with prior education classes went through c classes 3 - 5 years ago.

** 4 participants are interested in enrolling in the Comprehensive Diabetes Education Program for further education.

Comments:

"I think it was a good program"
"Good class, well presented"
"The most informative class I have attended"
"Thought class was complete and very helpful"

Suggestions:

More on diet x 4

Results of 3rd, 4th, 5th, and 6th classes:

Participants:

Type I diabetes -	1
Type II diabetes -	32
Non diabetic participants -	10

Medication regimen:

Diet/exercise only -	3
Oral medications/all types -	16
Insulin Requiring -	13
Combination therapy -	0

Monitoring regimen:

None -	6
2-4 times a week -	9
Once a day -	7
Two or three times a day -	8
Four times a day -	2

Attended previous education program before:

Yes -	19
No -	14

** 12 participants are interested in enrolling in the Comprehensive Diabetes Education Program for further education.

Appendix C

Class Handouts

Appendix C

DIABETES AND HEART DISEASE

*** AN ESTIMATED 16 MILLION PEOPLE IN THE UNITED STATES HAVE DIABETES, ONLY 8 MILLION ARE DIAGNOSED. SOME EXPERTS PREDICT THAT NUMBER WILL BE 20 MILLION BY THE YEAR 2000.

*** 80% OF PEOPLE WITH DIABETES DIE OF HEART DISEASE.

*** 77% OF ALL HOSPITALIZATIONS OF PEOPLE WITH DIABETES ARE MACROVASCULAR COMPLICATIONS (HEART DISEASE, HEART ATTACK, STROKE)

*** DIABETICS WITH HEART DISEASE USUALLY ARE YOUNGER, HAVE MORE SEVERE DISEASE AT THE TIME OF DIAGNOSIS, & HAVE MORE POST CARDIAC EVENT COMPLICATIONS.

*** DIABETIC MEN ARE AT 2 TO 4 TIMES GREATER RISK FOR HEART DISEASE, WOMEN 4 TO 6 TIMES.

*** DIABETES ITSELF CAN ACCELERATE ATHEROSCLEROSIS 200-400%.

*** MOST PEOPLE WITH DIABETES ARE TYPE II, CAUSED BY INSULIN RESISTANCE AND HYPERINSULINEMIA, BOTH OF ARE LINKED TO CAUSING OBESITY, HYPERTENSION, AND LIPID ABNORMALITIES (ELEVATED LDL AND TRIGLYCERIDES, DECREASED HDL).

Cardiac Rehab - Diabetes Education

1.) What is the normal blood glucose range?

Fasting blood sugar -	70 - 110
Impaired Glucose Tolerance -	110 - 126
Before lunch and dinner -	70 - 130
Bedtime -	100 - 130
1 - 2 hours after a meal -	< 160

2.) What is Diabetes?

A.) A Chronic disease involving the body's metabolism.

1.) Pancreas doesn't produce any insulin or not enough insulin.

2.) The body is unable to properly use the insulin produced. (Insulin Resistance/ Hyperinsulinemia)

3.) Type 1 Diabetes

* Pancreas makes no insulin
* Insulin dependent, must take shots for life
* 10% of people with diabetes have Type 1 diabetes
* Onset is quick
* Usually <30 years of age at diagnosis
* Thin body frames, especially at time of diagnosis

Causes:

* Genetic marker is triggered - starts an autoimmune reaction that kills the cells in the pancreas that make insulin.

Symptoms

* Increased thirst and urination
* Increased hunger combined with weight loss
* Flu-like symptoms (nausea and vomiting)
* Diabetic ketoacidosis/ Coma

Type 2 Diabetes

* Pancreas makes inadequate amounts of insulin
* Insulin Resistance/Hyperinsulinemia
* 90% of people with diabetes have Type 2 diabetes
* Usually over 40 years of age at time of diagnosis

Contributing Factors (** indicates heart disease risk factor also)

Uncontrollable

* Age
** Family History
* Ethnic Background
* History of Gestational diabetes or baby > 9 lbs.

Controllable

** Overweight/ obesity
** Sedentary lifestyle
** High fat diet
** High blood pressure
** High Cholesterol/triglycerides
** Stress
** Smoking

Symptoms

1. Fatigue
2. Blurry or double vision
3. Increased thirst and urination
4. Gradual weight gain or weight loss
5. Increased infections
6. Slow healing wounds
7. Dry itchy skin
8. Numbness and Tingling in hands and/or feet
9. Decreased circulation to lower extremities

Treatment

1. Meal plan
2. Increased physical activity and exercise
3. Oral medication
4. Insulin
5. Combination therapy

Exercise and Diabetes

When you exercise, your blood sugar can change rapidly, sometimes as much as 100 mg/dl or more. It's important to understand how and why your blood sugar drops so that you can manage it during and after exercise. Think of your body as a machine and the muscles as the engine that makes it go. Your muscles burn fuel in the form of glucose and fat, just as an automobile engine burns gas. You get these fuels from what you eat, as well as from what is stored in the muscles and the liver. When you start to exercise, glucose from your meal is used for fuel, as well as the glucose released from the muscles and the liver. Fat is stored in fat cells. During exercise, the fat cells release little molecules of stored fat into the blood stream to be used for energy by the muscles (this is how fat cells shrink and you lose weight).

Fat and glucose leave the blood stream and enter the muscle cells through receptors. These receptors are doors to the cells, with separate entrances for fat and glucose. The door for fat opens easily, but when you have diabetes, the door for glucose is frequently locked, and the key that unlocks the door is insulin. When there is enough insulin, glucose flows freely into the muscle cell. But when you don't have enough insulin, or when your cells don't recognize it, the glucose tends to accumulate in the blood stream. The result is high blood sugar.

When you exercise, the receptors on your cells become more sensitive to the insulin in your blood, causing the "door" to swing open freely. This allows glucose to rush into the muscle cells to meet the demands of exercise.

Many factors influence how much your blood sugar will drop during and after exercise. These include: **how hard your workout is, how long it lasts, the time since your last meal, your medication and it's time of peak action, the temperature, the weather, and the type of exercise you do.**

Low Blood Sugar and Exercise

Sometimes blood sugar drops for hours after a workout. This is often the case for people with Type 1 diabetes, but it also happens with Type 2. This happens because glucose that is normally stored in the muscles gets used up during long bouts of exercise, and to replace it, the muscles must take glucose out of the bloodstream. Low blood sugars can be seen 4 to 24 hours after a bout of exercise.

Guidelines for safe exercise

1. Always monitor your blood sugar before and after an exercise session, especially until you can establish a trend of how much your blood glucose tends to drop.

2. Try not to exercise at times when your medication is at peak action. If you are on insulin, be aware of peak action times:
   Humalog insulin: 45 to 90 minutes after injection
   Regular insulin : 2 hours after injection
   NPH or Lente insulin: about 6 to 7 hours after injection
   70/30 and 50/50: 2 hours after injection **and** 6 to 7 hours after injection

3. Do not inject insulin into the muscle area that you plan on exercising, exercise speeds up the action of the insulin.

4. Best time to exercise is 1 hour after a meal, this is when your blood sugar tends to be the highest.

5. Wear good shoes and pay careful attention to your feet. A small blister can turn into a bad infection if not taken care of properly.

6. Always try to exercise with a partner.

7. Always carry a form of fast acting sugar on you while exercising in case of a hypoglycemia reaction. (Glucose tablets, 2-3 pieces of hard candy, or money to buy a regular soda or juice).

8. Stay hydrated during exercise, dehydration can cause blood sugar to drop more than usual.

9. IF BLOOD SUGAR IS > 300, DO NOT EXERCISE UNLESS:
   1. YOU TEST FOR URINE KETONES: IF NEGATIVE OR TRACE AMOUNTS, YOU MAY EXERCISE BUT WILL NEED TO TEST DURING AND AFTER EXERCISE. **IF POSITIVE - DO NOT EXERCISE, YOUR BLOOD SUGAR WILL RISE NOT DROP!**

OR 2. START EXERCISE AND STOP 15 TO 20 MINUTES INTO EXERCISE SESSION AND TEST YOUR BLOOD SUGAR. IF IT HAS STARTED TO DROP, CONTINUE TO EXERCISE AND TEST AGAIN AT THE END OF THE SESSION.

10. Be aware that if you are on a Beta Blocker (Atenolol, Toprol XL, Tenormin). These medications are commonly prescribed for and needed by heart patients, but they will block the beginning phases of hypoglycemia. It is not uncommon for these patients to have blood sugars in the 50's and have no symptoms of a low blood sugar.

MONITORING

Recommendations for blood glucose monitoring:

Good control (oral medications or diet and exercise only)

2 times a day - 3 days a week
(2 days before breakfast and dinner, 1 day before lunch and bedtime)

Moderate control or anyone or insulin

2 times a day - 7 days a week
(5 days before breakfast and dinner, 2 days before lunch and bedtime)

Poor control or any Type 1 diabetic

4 times a day - 7 days a week

You should record your results in a blood glucose diary and look for trends (times when your readings are always high or low).

NCEP guidelines for Diabetics with established heart disease

LDL Cholesterol - < 100
HDL Cholesterol - > 45
Triglycerides - <150

Hemoglobin A1C

* Blood sugar average for 2 to 3 months
* Goal - within 1% of the upper limit of normal for your lab. Good rule of thumb - 7% or less.
* Should be done every 3 to 4 months for those not under good control, every 6 months for those in good control.

How to Compare

6% = 120 mg/dl
7% = 150 mg/dl
8% = 180 mg/dl
9% = 210 mg/dl
10% = 240 mg/dl
11% = 270 mg/dl
12% = 300 mg/dl
13% = 330 mg/dl

APPENDIX D

Needs Assessment

Appendix D

Dear Cardiac Rehabilitation Participant,

Over the past year, we have added a diabetes education class as part of the Cardiovascular Health Class Series at Spectrum Health East Campus. To help us improve our class and meet the needs and interests of future participants, we would appreciate it if you would take a couple of minutes to fill out the following questionnaire.

1.) Type of diabetes you have: ***Type 1, Type 2, not sure***
How long have you had diabetes? _____

2.) Do you currently self monitoring your blood sugars? ***yes*** or ***no***
If ***yes,*** how often? _____
What times? (please circle all that apply)
before breakfast, before lunch, before dinner, bedtime
What is the range for a normal blood sugar?_____

3.) Medication taken for diabetes: ***oral, insulin, both, none***
Name, dosage, and when taken:
_____

4.) Do you currently monitor your carbohydrate intake? ***yes*** or ***no***
Which of the following foods contain ***carbohydrate?***
(circle all that apply)

fruit chicken milk lettuce fruit juice hamburg spaghetti
toast ice cream fat free/no sugar added ice cream crackers
skim milk cereal potatoes green beans cookies yogurt
muffins meatballs diet cola fat free potato chips pretzels

In your opinion, which topics do you feel are important to include in a ***two hour*** diabetes education course?

Difference between Type 1 and 2 diabetes _____
Diabetes Medications _____
Guidelines for exercise with diabetes _____
Carbohydrate Counting (dietary overview) _____
Low Blood Sugar (signs and treatment) _____
Monitoring (self and important lab values) _____
Others:_____
_____

What days and times do you feel are most convenient for class offerings? (Keep in mind this class is offered every six weeks)
Please indicate with a ***1 or 2***, what would be your first and second choice.

Days:

Monday _____
Tuesday _____
Wednesday _____
Thursday _____
Friday _____

Times:

9:00 am to 11:00 am _____
10:00am to 12:00 pm _____
1:00 pm to 3:00 pm _____
2:00 pm to 4:00 pm _____
3:00 pm to 5:00 pm _____

Your age:_____
Gender:_____

Thank you so much for your time!! Please return this completed form to your exercise group leader or the cardiac rehab office.

APPENDIX E

Evaluation

Appendix E

MY ACTION PLAN

List two behaviors you want to work on to improve your blood sugar control.

1.) _____

_____

_____

_____

2.) _____

_____

_____

_____

Describe how each behavior will improve your health and life.

1.) _____

_____

_____

2.) _____

_____

_____

What can prevent you from changing your behavior?

1.) _____

_____

_____

2.) _____

_____

_____

EVALUATION

Your evaluation of this session will have an important effect on future programs. Thank you for providing honest, relevant feedback.

Please circle the number on the scale that best expresses your answer to the questions.

A. Program Content	NA	Not at All		Somewhat		Completely
1. Was the content for the session relevant?	0	1	2	3	4	5

B. Presenter	NA	Poor	Fair	Good	Very good	Excellent
1. Knowledge of subject	0	1	2	3	4	5
2. Organization and presentation	0	1	2	3	4	5
3. Teaching effectiveness	0	1	2	3	4	5

C. Objectives

Upon completion of the program the participant will be able to:

	NA	Not at All		Somewhat		Completely
1. Understand the increased risk of macrovascular disease in persons with diabetes.	0	1	2	3	4	5
2. Understand the importance of blood glucose monitoring and laboratory results in the management of diabetes.	0	1	2	3	4	5
3. Identify the guidelines for safe exercise for people with diabetes.	0	1	2	3	4	5
4. Understand basic carbohydrate counting.	0	1	2	3	4	5

Dear Cardiac Rehab Participant,

It's been several months now since you completed the diabetes education course through cardiac rehabilitation. At the end of class I asked each person to write one or two individual behavior changes and goals for your diabetes management. Today, I am asking if you would please take a couple minutes to tell us how you are doing on these changes. I have enclosed a prepaid envelope to use. This is very helpful for us to evaluate our program!

BEHAVIOR CHANGE/GOAL

1.)_____

_____

_____

How have you done with this change?

Excellent Pretty good Okay Not very good Not at all

2.)_____

_____

_____

How have you done with this change?

Excellent Pretty good Okay Not very good Not at all

Please feel free to call me with any questions! Thanks for your time!

Wendy S. Muma, RN, MSN
774-5182

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