PERCEPTION OF HEALTH, SOCIAL SUPPORT, AND HEALTH-PROMOTING BEHAVIOURS OF ANGIOPLASTY PATIENTS

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Perception of Health, Social Support, and Health-Promoting Behaviours of Angioplasty Patients

by

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Abstract

This descriptive correlational study with repeated measure design was conducted to investigate changes in health perceptions and health-promoting behaviours pre and post angioplasty. The relationships among social support, health perception, demographics, illness-related variables, and health-promoting behaviours were also examined. Pender's Health Promotion Model (1996) was used as the theoretical framework for the study.

The sample was comprised of 70 subjects, the majority of whom were male (78.6%), married (90%), between the ages of 45 and 64 (64.7%), had not completed high school (65.7%), and were either employed (40%) or retired (34.8%) with an annual family income less than $40,000 (74.2%). Data were collected through an interview at the time of angioplasty and a follow-up telephone call at approximately eight weeks. Instruments included the Health-Promoting Lifestyle Profile II (HPLP) and the Norbeck Social Support Questionnaire (NSSQ).

There were significant improvements in the total and all six subscale scores of the HPLP. Subjects scored highest on the interpersonal relations and spiritual growth subscales and lowest on the health responsibility and physical activity subscales. Health perception also improved significantly over time and was significantly related to HPLP total score at follow-up as well as the physical activity and spiritual growth subscales. Social support variables were

significantly related to the interpersonal relations subscale at the time of angioplasty but only one social support variable demonstrated a significant relationship with health-promoting behaviour (spiritual growth subscale) at follow-up. Age was significantly related to overall HPLP scores at the time of angioplasty but only the interpersonal subscale at follow-up. Females had significantly higher health responsibility scores at follow-up. Health perception and the health responsibility subscale explained 32.53% of the variance in total HPLP scores at follow-up.

The results of this study suggest that angioplasty patients are motivated to improve risk factor status and that many factors can influence this process. Also, there is need for more research in the area of health promotion for angioplasty patients, particularly the precise role of social support in this process.

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CHAPTER 1

Introduction

Coronary artery disease (CAD) is the progressive obstruction of blood flow through one or more coronary arteries related to the presence of atherosclerotic lesions. The resulting decreased oxygen supply to myocardial tissue may cause ischemia or infarction (Ignatavicius, Workman, & Mishler, 1995). Mortality and morbidity from CAD are due to a complicated interplay between atherosclerosis, vasomotor tone, platelet aggregation, and thrombosis (Fuster, Badimon, Badimon, & Chesebro, 1992; Shah & Helfant, 1988).

The medical treatment for CAD includes medications, coronary artery bypass surgery (CABG), and percutaneous transluminal coronary angioplasty. Because clinical and research findings have shown that a reduction in associated risk factors can significantly impact morbidity and mortality from CAD (Farmer & Gotto, 1996), lifestyle modifications have also been incorporated into treatment regimes (O'Keefe, Lavie, & McCallister, 1995). Nurses play a major role in practice, education, and research to reduce the impact of this disease.

CAD is the leading cause of death in developed countries (Fleury, 1992; Marmot & Mustard, 1994; Mullinax, 1995). In 1994 the Canadian mortality rate from CAD was 151 per 100,000 population, accounting for 44,175 deaths. The Newfoundland rate was slightly higher at 156.2 per 100,000 population (Statistics Canada, 1996).

A reduction in mortality rates for CAD has been associated with economic development. Improvements in health care, such as better diagnostic services and treatment, as well as improvements in lifestyle are thought to be contributing factors (Marmot & Mustard, 1994). Despite this decline, CAD continues to be the leading cause of morbidity and mortality in Canada. According to the 1993 Health Canada statistics cardiovascular disease had a major financial impact on the health care system, accounting for over $8 billion dollars of the total direct costs of all illnesses (Heart and Stroke Foundation of Canada, 1995).

Information which can help reduce the effects of this disease will benefit patients and families as well as the health care system. An understanding of the factors which influence the adoption and maintenance of health-promoting behaviours can help ensure that decreasing health care dollars are spent wisely to improve the long term health outcomes of patients with CAD, including those who have undergone angioplasty.

The purpose of the current study was to investigate the effects of social support, health perception, and demographic and illness-related variables on the health-promoting behaviours of angioplasty patients. A second purpose was to investigate changes, if any, in health-promoting behaviours and health perception following an invasive procedure such as angioplasty.

Background and Rationale

Percutaneous transluminal coronary angioplasty involves the threading of a balloon tipped catheter through a coronary artery. The inflation and deflation of the balloon compresses plaques against the arterial walls to reduce stenosis. First introduced in 1977, angioplasty is much less invasive, expensive, and debilitating than bypass surgery. This procedure is an attractive option for which up to 50% of people with CAD are candidates (Hartzler, Hlatky, King, & Phillips, 1992). Medical suitability for angioplasty is determined by the complexity and location of lesions. Candidates for angioplasty usually have single- or double-vessel disease and lesions are discrete, proximal, and noncalcified (Ignatavicius et al., 1995).

It has been estimated that 54% of the decrease in CAD is due to lifestyle modification (Heart and Stroke Foundation of Canada, 1993). Studies have found that risk factor modification can halt the progression of mild to moderate coronary stenosis and may even cause regression of severe stenosis (Gould et al., 1992; Ornish et al., 1990). Individuals can play a role in the management of CAD by reducing the impact of modifiable risk factors. Activities such as smoking cessation, hypertensive management, regular exercise, and dietary modification have been associated with reduced incidence of and mortality from CAD (Sytkowski, Kannel, & D'Agostina, 1990). However, studies have shown that people fail to make significant lifestyle changes or adhere to them for long

periods (Andrew et al., 1981; Digenio et al., 1991; Dishman, 1982; Godin & Shephard, 1990; Mullinax, 1995).

Although angioplasty is not a cure for CAD, these patients do experience a marked improvement in quality of life and decrease or cessation of symptoms (Allen, Fitzgerald, Swank, & Becker, 1990; Berger, Wililams, & Reinert, 1986; Bliley & Ferrans, 1993; Gulanick & Naito, 1994; Parisi, Folland, & Hartigan, 1992). Because of the reduction in symptoms which act as a stimulus to modify behaviour, patients may fail to make needed lifestyle changes (Gaw, 1992; Hanson, 1988). It has even been postulated that the comparable ease of the procedure may negatively impact lifestyle modification by decreasing the fear of medical intervention and enhancing misconceptions about the risks and consequences associated with CAD (Gaw, 1992; Jenkins & Kotra-Ottoboni, 1991; Shah et al., 1986).

Study findings also indicate that people respond differently to various cardiac events (Jaarsma, Kastermans, Dassen, & Philipsen, 1995; Kison, 1992; Mooney et al., 1992). Because angioplasty patients do not experience the same pain, disability, and perceived risk that accompany bypass surgery or myocardial infarction, interventions developed to promote risk factor modification in one group may not be effective for another group of patients (Jensen, Banwart, Venhaus, Popkess-Vawter, & Perkins, 1993). Due to the shortened hospital stay and decreased available patient teaching time, findings from studies which focus

on coronary artery bypass and myocardial infarction patients may not be generalizeable to angioplasty patients.

Due to the relatively recent increase in the use of angioplasty, this group of patients have not been extensively studied in relation to risk factor modification, rehabilitation, and health maintenance (Jensen et al., 1993; Tooth & McKenna, 1995). Given the limited and inconclusive findings on angioplasty patients, this group was chosen as the target population for this study.

Problem Statement

While the population of patients treated with angioplasty continues to increase, time available for inpatient education is decreasing due to shorter lengths of hospital stay, usually 24 to 48 hours (Hartzler et al., 1992). The factors which affect the likelihood of engaging in health-promoting behaviours must be understood and pertinent interventions developed and implemented in the hospital and the community setting. Oldridge (1988) stated that "compliance-enhancing strategies should be investigated only if it has been shown that the condition under consideration is an important cause of mortality and premature disability, that the intervention or therapy is effective, and that compliance with the intervention is poor" (p. 42). All three of these conditions have been met regarding risk factor modification for people with CAD.

The restenosis rate following angioplasty is between 25% and 40%

(Hartzler et al., 1992; Lee, 1995). Failure to modify risk factors has been associated with the restenosis of lesions treated by angioplasty (Galan, Deligonal, Kern, Chaitman, & Vandormael, 1988; Reis, Kuntz, Silverman, & Pasternak, 1992). Any area of study which looks at the factors affecting health-promoting behaviours in this fast-growing population is an appropriate area for research.

The Health Promotion Model (Pender, 1996) identifies factors which influence health behaviour. These factors include prior related behaviour, personal factors, self-efficacy, benefits and barriers to health behaviours, as well as interpersonal and situational influences. Social support and health perception have not been adequately studied in angioplasty patients to determine what effects they have, if any, on health-promoting behaviours.

Research Questions

This study was designed to address the following research questions.

1) Is there a significant relationship between social support and health-promoting behaviours of angioplasty patients?
2) Is there a significant relationship between health perception and health-promoting behaviours of angioplasty patients?
3) Are the health-promoting behaviours of angioplasty patients a function of demographic (age, gender, income, education) and illness-related

variables (comorbidity, length of time since diagnosis, chest pain at follow-up)?

4) Will changes occur in perceptions of health status and health-promoting behaviours from the time of angioplasty to approximately eight weeks post procedure?

CHAPTER 2

Literature Review

An understanding of the health-promoting behaviours of angioplasty patients requires insight into the risk factors for CAD, and the factors which impact lifestyle changes. The review of relevant literature is divided into five major sections. The first section presents an overview of risk factors involved in the development of CAD, as well as risk-reduction strategies. The second section presents a general discussion on the factors affecting health-promoting behaviours in cardiac and healthy populations. Special consideration is given to educational programs, emotional/psychological influences, and select demographic variables. The third section summarizes quantitative and qualitative research findings on the role of social support in facilitating the incorporation of health-promoting behaviours in diverse populations. The fourth section discusses the research literature on the role played by health perception in cardiac and healthy populations. The final section presents a brief discussion on the conceptual framework for this study.

Risk Factors for CAD

Risk factors for CAD are the conditions or characteristics that increase the likelihood of developing the disease or augmenting its progression. In an attempt to decrease morbidity and mortality from CAD, early research focused

on the identification of risk factors. Recent studies continue to explore risk factors for the development of CAD but also investigate their role in the progression of the disease. There is consensus that the major risk factors are age, family history, elevated low-density lipoprotein cholesterol (LDL), decreased high density lipoprotein (HDL), cigarette smoking, hypertension, and diabetes mellitus (Farmer & Gotto, 1996).

In 1978, data from five major longitudinal studies were pooled for a combined analysis of observations of 8,422 males over 72,011 person years. Findings confirmed the strong relationship between susceptibility to coronary events and age, hypertension, serum cholesterol, and smoking (Pooling Project Research Group, 1978). A major limitation of this research was that it was restricted to males.

There is a growing body of evidence supporting the significant influence of risk factors for CAD. Support for the following risk factors continues to be well-documented in research studies: age (Rubin et al., 1990; Wilson & Evans, 1993), family history of heart disease (Hunt, Williams & Barlow, 1986; Khaw & Barrett-Connor, 1986), smoking (Hermanson et al., 1988; Wilson & Evans, 1993), hypertension (MacMahon et al., 1990; Wilson & Evans, 1993), plasma lipid levels (Andrews et al., 1997; Law, Wald, & Thompson, 1994; Tracy & Tracy, 1997), and diabetes (Abbott, Donahue, Kannel, & Wilson, 1988; Kannel, Wilson, & Zhang, 1991).

The West of Scotland Coronary Prevention Study Group (1997) provided further support for the influence of modifiable risk factors on CAD morbidity and mortality. In a randomized controlled placebo study designed to determine the benefits of pravastatin in decreasing plasma cholesterol levels to prevent cardiac events, 6,595 men aged 45 to 64 were followed every three months for an average of 4.9 years. Multivariate analysis demonstrated that treatment with pravastatin exerted an independent and significant effect on the reduction of definite CAD death or nonfatal myocardial infarction (MI) by 32% ($p = .0001$). Smoking, diabetes, family history, age, hypertension, and low LDL to HDL ratio were also identified as independent predictors of CAD. Because of the significant effects of lifestyle factors on morbidity and mortality, the authors stated that aggressive risk factor modification should be addressed prior to the initiation of drug therapy. A major criticism of this study is that it failed to include women or subjects over the age of 64 years, therefore, generalizability is limited.

Because of the earlier onset of the disease as well as higher prevalence rates, male gender is considered to be a risk factor for CAD (Bush, 1996). However, a recent prospective six-year study of men ($\underline{n} = 664$) and women ($\underline{n} = 822$), with a mean age of 69 years, failed to document a significant relationship between fatal CAD and masculine and feminine traits as defined by the Bem Sex Role Inventory (Barrett-Connor, 1997). One possible explanation for these findings is the significant increase in the incidence of CAD for women over 54

years of age when they actually have a higher mortality rate (32%) than men (27%) from MI (Lerner & Kannel, 1986). The reasons for this higher mortality rate are not well understood but may be due to later diagnosis and treatment or smaller heart size (Bush, 1996).

The use of estrogen replacement therapy after menopause has been found to exert a protective effect (Stampfer, Colditz, & Willet, 1991). In a review of case-control and cohort studies about estrogen replacement therapy, Kalin and Zumoff (1990) found a decreased risk of CAD for women taking hormone replacement in 19 out of 31 studies. The addition of progesterone to hormone replacement therapy to reduce the risk of estrogen induced carcinoma may diminish its protective effect. This question is currently under study (Farmer & Gotto, 1996).

Additional factors have been the subject of more recent research and are now being included as definite risk factors for CAD. These include: physical inactivity (American Heart Association, 1992; Leon, Connett, Jacobs, & Rauramaa, 1987; Raichlen, Healy, Achuff, & Pearson, 1986), stress (Jiang et al., 1996; Kubzansky et al., 1997; Rosengren, Tibblin, & Wilhelsen, 1991), and obesity, especially abdominal obesity, or waist-to-hip ratio (Folsom et al., 1993; Hubert, Feinleib, McNamara, & Castelli, 1983; Manson et al., 1990; Walton et al., 1995).

CAD Risk Reduction

In reviewing the literature on established risk factors for CAD, it is clear that a great deal of responsibility can be assumed by individuals to reduce the risk of fatal or nonfatal cardiac events. Smoking cessation has been shown to improve the survival rate of patients (Hallstrom, Cobb, & Ray, 1983; Hermanson et al., 1988; Rosenberg, Palmer, & Shapiro, 1990; Vlietstra, Kronmal, & Oberman, 1982). According to the United States Surgeon General, smoking cessation will reduce the morbidity and mortality from CAD by about 50% within one year (U.S. Department of Health and Human Services, 1990).

Hypertension can be treated with medication, weight reduction, sodium restriction, exercise, and stress reduction (Chockalingam et al., 1990; MacMahon, MacDonald, Bernstein, Andrews, & Blacket, 1985). Serum cholesterol levels, specifically LDL, can be reduced with dietary modifications (Law et al., 1994) and the amount of HDL can be increased through low-fat, low-cholesterol diet and exercise (Connelly et al., 1992). Proper management of diabetes through diet, exercise, and medication can reduce the impact of this disease on CAD (Vinik & Wing, 1992). Weight reduction to a body mass index of 20 to 27 can have a direct positive effect on CAD or exert an indirect effect by modifying the impact of other risk factors such as hypertension, hyperlipidemia, and diabetes (Chockalingham et al., 1990; Lavie & Milani, 1997). Physical activity has also been shown to have a direct impact and an indirect effect by

reducing other risk factors such as hypertension, obesity and total cholesterol levels (Blair, 1993; Cunningham, 1992; Hagberg, Montain, Martin, & Ehsani, 1989). Relaxation and stress management techniques have been shown to be effective in reducing stress levels (Turner, Linden, van der Wal, & Schamberger, 1995).

Oldridge, Guyatt, Fischer, and Rimm (1988) conducted a meta-analysis of 10 randomized clinical trials investigating the effects of cardiac rehabilitation on mortality and morbidity following a MI. In order for sites to be included in the study, rehabilitation programs had to offer risk factor management for at least six weeks post-MI, and follow patients for a minimum of 24 months after program completion. A total of 4,347 patients were recruited into the study. Although results indicated that cardiovascular mortality was reduced by 25% ($p = .006$), there was no significant reduction in nonfatal recurrent MI. The authors were unable to explain this finding and recommended that more research be conducted in the area. A major limitation of this study was that only three of the 10 studies had female subjects.

Summary

Research into the risk factors responsible for the development of CAD is ongoing. Numerous other possible contributors are being studied including thrombogenic, inflammatory, and immunologic processes as well as the role of

dietary iron (Heart and Stroke Foundation of Canada, 1995). Further, there is sufficient knowledge to support lifestyle modification for the primary and secondary prevention of CAD. The adoption of health-promoting behaviours by patients with CAD is vital in reducing the morbidity and mortality associated with this disease.

Health-Promoting Behaviours

Dunne (1961) was one of the first researchers to discuss the influence of behaviour on promoting wellness and longevity (as cited in Walker, Sechrist, & Pender, 1987). Ardell (1979) expanded on the idea of health-promoting behaviours to include such concepts as self responsibility, nutritional awareness, stress management, physical fitness and environmental sensitivity. While the topic of health promotion has increased in popularity, there is limited research on health-promoting behaviour maintenance, and study findings are certainly not conclusive (Bottoroff, Johnson, Ratner, & Hayduck, 1996).

Factors Affecting Health-Promoting Behaviours

Several factors influence the adoption of health-promoting behaviours by individuals with CAD. Consideration is given to those factors which have received the most attention in studies focusing on healthy subjects and individuals with CAD (e.g., patient education programs, motivation, attitude, self-

efficacy, and demographic variables). There is a scarcity of literature which specifically focuses on the health-promoting behaviours of angioplasty patients (McKenna, Maas, & McEniery, 1995).

Education programs. Gortner & Jenkins' (1990) experimental study of 149 recovering coronary artery bypass graft surgery patients found evidence for the positive effects of education programs on cardiovascular risk reduction. Control and experimental groups received routine information on recovery, but the experimental group had more intense education sessions and telephone follow-up for eight weeks. Experimental subjects reported higher levels of physical activity at 4 (p = .05), 8 (p = .02) and 12 (p = .03) weeks. Treatment status (control or experimental) explained 15% of the variance for activity at 12 weeks (p = .018).

Education programs, including individual, group and family teaching, have been linked to increased compliance with medical regimens and decreased risk behaviours in studies of cardiac patients (Hoff & Lowenstein, 1994; Marshall, Penckofer, & Llewellyn, 1986; Mullen, Mains, & Velez, 1992; Tirrell & Hart, 1980). In a meta-analysis of 28 controlled trials of cardiac teaching, Mullen et al. (1992) found that behaviourally oriented interventions and adherence to educational principles resulted in a greater reduction in risk factors than programs that focused only on information provision. These authors also found that educational programs were significantly related to decreased cardiac

mortality.

Motivation. McSweeney (1993), in a descriptive, naturalistic field study, conducted ethnographic interviews with MI patients (N = 16). Motivation, defined as thoughts and beliefs that foster actions and attitudes, was identified as a key factor in facilitating health-promoting behaviours. Gaw (1992), in a qualitative study of angioplasty patients (N = 14), also found that lack of motivation was a key factor inhibiting necessary lifestyle changes. Patients considered themselves to be cured of CAD and believed lifestyle changes were unnecessary (Gaw, 1992).

Attitude. In a descriptive correlational study, Miller, Wikoff, McMahon, Garrett, and Ringel (1985) investigated indicators of medical regimen adherence in a sample of 141 cardiac rehabilitation patients experiencing their first MI. Attitudes toward healthy behaviours and the perceived expectations of others were measured by the Miller Attitudinal Scale and the Health Intention Scale. Adherence to medical regimen was measured by the Health Behaviour Scale. Patient attitude and perceived expectations of others accounted for a significant proportion of the explained variance for diet modification (22%), smoking cessation (34%), physical activity (33%), medication adherence (61%), and stress management (39%). Comparable findings have been reported in other studies of cardiac patients (Miller, Wikoff, Garrett, McMahon, & Smith, 1990) and the general population (Pender & Pender, 1986).

Qualitative findings also support the relationship between attitude and health-promoting behaviours. Resistive attitude, or not wanting to change behaviour, was found to be the biggest factor inhibiting health-promoting activities for patients who had experienced a MI (McSweeney, 1993). Subjects stated that resistive attitudes had to be overcome to increase their self-motivation. This suggests a link between attitude and motivation.

Health beliefs. Health beliefs, or beliefs which influence decisions regarding health care, have also been linked to health-promoting behaviours. Health beliefs include perceived benefits and barriers to behaviour as well as locus of control and health values. McSweeney (1993) found that perceived barriers such as weather, time, and financial constraints affected compliance with health-promoting behaviours in cardiac patients. In a cross-sectional study comparing different groups, Godin et al. (1994) designed a questionnaire to measure perceived barriers to exercise in pregnant women (n = 139), individuals with CAD (n = 162), and the general population (n = 349). Significant negative correlations were found between perceived barriers and intention to exercise in the CAD group, r = -.37, $p < .001$, the general population, r = -.25, $p < .001$, and pregnant women, r = -.18, $p < .05$. Comparable findings for cardiac patients were noted by Tirrell and Hart (1980).

In a naturalistic study, Biggs and Fleury (1994) investigated perceived barriers to cardiovascular risk reduction. Five major barriers to initiating and

sustaining health behaviour change were generated from the data obtained from a group of cardiac rehabilitation patients (N = 29). The dominant thematic categories were labelled affective responses, physical response patterns, environmental factors, social relationships, and resources.

Fleury (1991) designed a descriptive correlational study to investigate the relationship between wellness motivation and social support systems, health locus of control, and health value orientations in a sample of cardiac rehabilitation patients (N = 52). Internal control over health and health value orientation explained 32% of the variance in wellness motivation (Fleury, 1991).

Self-efficacy. Self-efficacy, the belief that one is capable of doing something, has been identified as a predictor of health-promoting behaviours. In a review of 21 studies, Strecher, DeVellis, Becker, and Rosenstock (1986) found empirical support for the influence of self-efficacy on success with smoking cessation, losing weight, and exercising in various populations including cardiac patients.

In a descriptive correlationai study Stuifbergen and Becker (1994) investigated predictors of health-promoting lifestyle behaviours in individuals with disabilities (e.g., neuromuscular, neurocognitive, chronic illness, hearing or visually impaired). Self-efficacy was found to be significantly correlated with health-promoting behaviours of persons living with disabilities ($p < .01$). Comparable findings were reported by Weitzel (1989) in a study designed to test

Pender's Health Promotion Model in a sample of blue collar workers (N = 179).

Demographics. Inconsistent findings have been generated from studies investigating the effects of demographic variables on behaviours that promote cardiovascular health. Education level was found to be positively correlated with health-promoting behaviours in some studies (Duffy, 1988; Kison, 1992; Riffle, Yoho, & Sams, 1989; Weitzel, 1989) but not in others (Miller et al., 1985; Tirrell & Hart, 1980). Income, which is often associated with education, was not found to be significantly related to health-promoting behaviours in a sample of blue-collar workers (Weitzel, 1989). In a worksite study, Rost, Connell, Schechtman, Barzilai, and Fisher (1990) found that highly educated, male management employees were more likely to be recruited into a cardiovascular risk factor reduction program than females. However, female non-management employees with less education demonstrated higher continuance rates.

Investigations of the relationship between age and health-promoting behaviours have produced inconsistent findings. The correlation between age and healthy cardiovascular behaviours was positive in some studies (Franks, Campbell, & Shields, 1992; Kison, 1992), negative in one study (Riffle et al., 1989), and non-significant in others (Hilbert, 1985; Miller et al., 1985; O'Reilly & Thomas, 1989).

Stuifbergen and Becker (1994) found that female gender was the only significant demographic variable related to health-promoting behaviour in a

sample of persons with disabilities. Rice et al. (1994) found that male gender was significantly related to success with smoking cessation for 255 cardiac patients. However, Miller et al. (1985) reported that gender was not a significant predictor of adherence to health-promoting behaviours in cardiac patients (N = 112). Hubbard, Muhlenkamp, and Brown (1984) found that being married was significantly related to positive health practices in a sample of senior citizens but not in a sample of younger adults with a mean age of 44.

The inconsistent results reported for the relationships between demographics and health-promoting behaviours may be due to a number of factors. Small sample sizes and varying lengths of time for follow-up may affect study results. Outcome measures also varied. Demographics may play a different role in the initiation of health behaviours as opposed to the long term adherence of lifestyle changes.

Health-Promoting Behaviours of Angioplasty Patients

Variable results have been obtained on the degree to which angioplasty patients engage in health-promoting behaviours. In a prospective, longitudinal study of angioplasty patients (N = 209), McKenna et al. (1995) assessed coronary risk factor status pre and 11 months post angioplasty. Despite the absence of a structured educational rehabilitation program, the authors found significant improvements in serum cholesterol levels ($t = 6.24$, $p < .001$), body

mass index (t = 3.93, p < .001), and exercise habits (χ^2 = 38.06, p < .001). However, there was a significant increase in the number of patients smoking (χ^2= 13.80, p < .001) and the number of cigarettes smoked per day (t = 2.38, p <. 05).

In a descriptive study, Gulanick and Naito (1994) used a project derived questionnaire, the Self-Report of Recovery, to examine the health status, expectation of restenosis, self-efficacy, and lifestyle changes of first-time angioplasty patients (N = 54) at one, six and twelve weeks post procedure. The majority of patients rated high self-efficacy levels for all risk factor reduction behaviours. At 12 weeks, 21% of patients had resumed smoking and 65% had modified their diets. However, less than 50% had lost weight, or had been exercising regularly, taking prescribed medications, or managing stress effectively.

These quantitative studies showed some improvement in health-promoting behaviours of angioplasty patients. This is in contrast to a qualitative study by Gaw (1992). The author found that only four of fourteen subjects planned any specific lifestyle changes following the procedure, but none had actually followed through with these changes.

Summary

Godin (1989) reviewed 24 studies to identify the effects of different interventions on diet, exercise, and smoking behaviours of individuals with CAD.

It was determined that studies with less rigorous designs yielded positive results more frequently than those with more advanced evaluation methods. The author concluded that more rigorous research is needed to establish the benefits of interventions for lifestyle modification of people with CAD.

Research in the area of health-promotion is relatively new and still developing (Redland & Stuifbergen, 1993). In a review of nursing literature between 1982 and 1990, Kulbok and Baldwin (1992) found only 29 health promotion research studies. The terms health promotion and preventive health behaviours were often used synonymously, and health-promoting behaviours were conceptualized and operationalized in diverse ways. The conceptual ambiguities and use of multiple operational measures made cross-study comparisons difficult, and could be contributing to the inconclusive findings in this area.

Research findings, while not conclusive, indicate that patient education, motivation, attitude, health beliefs, and self-efficacy play a role in promoting lifestyle modification for CAD. However, cardiac patients, including those who have undergone angioplasty, are not committing themselves to lifestyle modification. There are no studies which identify or explain all the factors influencing health-promoting behaviours in cardiac patients or any other population, thus making this a topic worthy of further research.

Social Support

The controversy about the benefits of social support (Krishnasamy, 1996) has not decreased its attractiveness for researchers in a variety of disciplines including anthropology, epidemiology, medicine, nursing, psychology and sociology (Norbeck, 1988). While definitions of social support vary, most include common elements. Social support has both functional and structural properties (Callaghan & Morrissey, 1993; Norbeck, Lindsey, & Carrieri, 1981). Functional refers to the type of support offered, while structural describes the size of the network and frequency of contact (Callaghan & Morrissey, 1993). Social support is also seen as a multifaceted construct which provides positive regard and a sense of belonging, and is of a reciprocal nature (Hubbard et al., 1984).

Understanding how social support influences health requires an understanding of its various dimensions. Most theorists and researchers acknowledge the instrumental, informational and emotional components of functional support. Instrumental, or tangible support, addresses the provision of material aids. Informational support focuses on the provision of information, advice, and guidance. Finally, emotional support refers to the expression of positive affect, and acknowledging feelings (Callaghan & Morrissey, 1993; Krishnasamy, 1996). Kahn (1979) identified affirmation, the endorsement of another persons behaviours, perceptions or views, as an additional component of social support.

Studies which have investigated the relationship between social support and health viewed social support as having either a direct, protective impact on the individual or an indirect affect on health by acting as a buffer for stressful life events (Hubbard et al., 1984; Norbeck, 1988). Zimmerman and Connor (1989) suggested several ways in which significant others may influence an individual's health behaviours. These include verbalizing concern about the person's health, reinforcing health behaviour change, having control over the health-related environment, reducing a sense of loneliness and increasing self-esteem, participating with the individual in a health program, and changing personal health habits.

Social Support and Health-Promoting Behaviours

In a diversity of populations, social support has been shown to be significantly related to health outcomes (Callaghan & Morrissey, 1993; Krishnasamy, 1996; Tilden & Galyen, 1987). Findings from studies which investigated the relationship between social support and health-promoting behaviours to reduce CAD have produced inconsistent findings (Fleury, 1991; Franks et al., 1992; Hilbert, 1985; McSweeney, 1993; O'Reilly & Thomas, 1989).

Quantitative findings. In a descriptive correlational study, Fleury (1991) investigated the relationship between social support, health locus of control, health value orientations and wellness motivation in a convenience sample of

post MI patients (N = 52). The Norbeck Social Support Questionnaire was used to measure social support and the Self-Motivation Inventory measured wellness motivation. Acceptable reliability and validity findings were stated for these instruments. No significant relationship was found between social support and wellness motivation. The small sample size in relation to the number of independent variables may have contributed to measurement error in this study.

Hilbert (1985) found no relationship between spousal support and compliance with such health-promoting behaviours as improved diet, weight loss, smoking cessation and exercise in 60 males, 3 months to 17 years after a MI. The Spouse Support Questionnaire and the Compliance Questionnaire used in this descriptive correlational study demonstrated acceptable levels of reliability and validity. The authors suggested that increased support may have been the result of non-compliance. In other words, wives of non-compliant subjects may have increased their support in order to increase their husbands' compliance.

O'Reilly and Thomas (1989) developed a questionnaire based on previous tools used to measure social support and social networks in a sample of 204 cardiac patients. No significant relationship was found between the level of general support and cardiovascular risk status. However, when subjects were grouped according to cardiovascular risk factor status after three years, significant differences were found in mean specific social support variables between those who had maintained their status (n = 58) and those who had not

(n = 131). These variables included four types of support: information advice (p = .0002), appraisal (p = .0008), emotional support (p = .001) and availability (p = .01). Maintainers were also more satisfied with their support (p = .003) and reported less conflict (p = .006) with support persons. The authors stressed the importance of using an instrument which not only reflects the multi-dimensionality of social support but also incorporates operational indicators specific to the outcomes of the study.

Franks et al. (1992) studied the relationship between social support and cardiovascular health behaviours in a random sample of 182 adults attending a family practice clinic. Social relationships were measured using the Interpersonal Support Evaluation List and the Family Emotional Involvement and Criticism Scale. A relationship was found between family functioning and behaviours promoting cardiovascular health (p = .05). There was no significant direct relationship between social support and cardiovascular health behaviours. Because of the observed indirect effects of social support on health behaviours through family functioning, the researchers stressed the importance of developing a more complex model to understand the relationship between social support and health behaviours.

In a descriptive correlational study using a convenience sample of 98 well adults from an apartment complex, Muhlenkamp and Sayles (1986) explored the relationship between social support and health practices. The Personal

Resources Questionnaire was used to measure social support. Positive health practices were measured by the Personal Lifestyle Questionnaire. Acceptable reliability and validity findings were stated. Social support was found to be highly correlated with positive health practices ($r = .26$, $p < .01$). However, when all equations were entered into path analysis, social support had no direct effect on health practices but exerted an indirect influence through self-esteem ($r = .54$, $p \leq .0001$). The authors stressed the need for further research in this area.

In a study investigating the relationship between perceived social support and positive health practices, Hubbard et al. (1984) measured social support using the Personal Resources Questionnaire and health behaviours using the Lifestyle Questionnaire. Study findings demonstrated that social support accounted for 14% of the variance in positive health practices in the seniors group ($n = 97$) and 34% of the variance in the younger adult group ($n = 133$).

In a descriptive correlational study, one group pre-test/post-test design, Zimmerman and Connor (1989) looked at the effects of significant others on health behaviour changes using instruments developed for the study. The sample consisted of hospital employees ($N = 84$) enrolled in a health promotion program to reduce cardiovascular risk factors. The authors found that support from family, friends, and co-workers positively influenced attempts to change health behaviours. Improvements in fat intake, salt use, exercise and cigarette consumption were positively correlated with: family helpfulness, $r = .33$, $p < .01$,

supportiveness, $r = .31$, $p < .01$, encouragement to maintain health behaviours, $r = .23$, $p < .05$, and friends' helpfulness, $r = .25$, $p < .05$. Changes in health behaviours by significant others was positively correlated with decreased fat intake ($r = .20$, $p < .05$). Co-workers' helpfulness was not significantly related to any of the outcome variables.

Only one study investigating the relationship between social support and health-promoting behaviours of angioplasty patients was identified from a review of relevant literature. Murphy, Fishman, and Shaw (1989) examined the effect of coping style, anxiety, locus of control, and social support on learning during a structured educational program for a sample of 97 patients undergoing angioplasty. The Norbeck Social Support Questionnaire measured social support and the Coronary Angioplasty Risk Factor Reduction Inventory was developed to measure knowledge. Using multiple regression analysis on pre-discharge data, coping style, as measured by the Taylor Manifest Anxiety Scale and the Marlowe-Crowne Social Desirability Scale, was found to be the only significant predictor of knowledge level. At six months and two years, none of the independent variables were significantly related to knowledge level. This study did not measure health behaviour so no conclusions can be made about the direct effect of social support on health-promoting behaviours. However, knowledge has been associated with health-promoting behaviours (Hoff & Lowenstein, 1994; Marshall et al., 1986) and is one way in which social support

could indirectly influence health behaviours.

Qualitative findings. In a descriptive, naturalistic field study, McSweeney (1993) examined factors which contributed to the initiation and maintenance of behavioral changes related to diet and exercise. The sample consisted of eight married couples, of which one partner had experienced a MI. Using content and the constant-comparison methods of analyses, the researcher found that support from family, friends, and professionals was important in facilitating health-promoting activities.

Fleury (1993) conducted a qualitative, naturalistic study to explore the role played by social networks in cardiovascular risk reduction. The constant comparative method of analysis was used to collect and analyze data from 24 participants in an out-patient cardiac rehabilitation program. Social support was found to have both enabling and limiting effects on patient's motivation to implement health behaviour changes. Emotional support, acknowledgement and encouragement from support persons were reported to enhance health behaviour change. Lack of reinforcement, fostering dependence and maintaining status quo by social network members limited the initiation and maintenance of risk factor modifications.

Summary

Roberts (1988) reviewed the theoretical and research literature on the

proposed relationship between social support and help-seeking behaviours. The author found research support for the important role that social networks play in transmitting values and beliefs that influence health behaviours. Norbeck (1988) reviewed 67 nursing studies related to social support. Although social support had significant implications for various aspects of health in different settings, inconsistent findings were found for its effects on health behaviour. The author identified the need for further research with valid social support instruments. In a later literature review on social support, Callaghan and Morrissey (1993) reported comparable findings.

Social support has recently been discussed in the literature as having a negative as well as a beneficial effect. Conflictual relationships and the reciprocal nature of social support impact the effects of social support and require further study (Tilden & Galyen, 1987; Franks et al., 1992).

In summary, qualitative findings, though scarce, suggest that social support influences health-promoting behaviours, while quantitative findings are inconsistent. This may be due to differences in instruments, patient populations and the complexity of the concept. These inconsistent findings and the limited research with angioplasty patients indicate a need for further inquiry in this area.

Health Perception

Because of the limited research examining health perception and health-promoting behaviours in the cardiac population, the relationship between these variables in other populations was also considered. Speake, Cowart, and Pellet (1989) investigated the effects of health perceptions and locus of control on lifestyle behaviours in a group of 297 elderly volunteers. Health perceptions were measured by three Likert-type questions (i.e., present status, changes, comparison to others), and health-promoting behaviours by the Health Promoting Lifestyle Profile (HPLP). During multiple regression perceived changes in health status surfaced as a predictor variable for the total score on the HPLP and all the subscales, except for self-actualization. Present health perceptions surfaced as a significant predictor for only the interpersonal and self-actualization subscales, and perceived health status compared with others for only the exercise subscale and total score on the HPLP.

Riffle et al. (1989) found a modest relationship between self-reported health and health-promoting behaviours in a sample of Appalachian elderly (N = 113). Perceived health status was measured by three questions which were not identified by the authors, and health-promoting behaviours by the HPLP. The cumulative health perception score was positively correlated with the self-actualization subscale, r = .31, p < .001, exercise subscale, r = .28, p < .002, and total HPLP score (r = .22, p = .01).

In a sample of 179 blue collar workers, Weitzel (1989) found perceived health status to be predictive of health-promoting behaviours. Health status, as measured by the Health Scale, explained 9% of the variance in the total HPLP score. Health status also explained a portion of the variance in subscale scores: self-actualization (4%), health responsibility (6%), exercise (10%), nutrition (5%), and stress management (2%).

A study was conducted on male workers' (N = 325) participation in physical activity (Desmond, Conrad, Montgomery, & Simon, 1993). Health perception was measured by two four-point Likert scale items asking subjects to rate overall health and health compared to others. Multiple regression analysis showed that health perception was a significant predictor for sports activity (p = .03), but not overall physical activity (p = .09). Because data were collected cross-sectionally, it was not clear whether positive health perception motivated sports activity or vice versa.

Gillis (1994) looked at the relationship between health perception and health-promoting behaviours in a sample of 184 adolescent females. Health perception, as measured by the Health Scale, accounted for 4.5% of the variance in health-promoting behaviours as measured by the HPLP.

Some studies have not shown a significant relationship between health perception and health-promoting behaviours. Rice et al. (1994) looked at the effectiveness of smoking cessation programs for a convenience sample of 255

adults who had been diagnosed with a cardiovascular health problem. Perceived health status was measured by asking subjects to rate their health on a nine-point visual analogue scale. This variable was not found to be significantly related to smoking cessation. Three demographic variables - male gender, married and high annual income - were found to be significantly related to success with smoking cessation.

In a convenience sample of 117 persons with disabilities, Stuifbergen and Becker (1994) were able to account for 50% of the variance in the total score of the HPLP. Self-rated abilities (38%), general self-efficacy (6%), wellness definition of health (2%), mechanical assistance needed (2%) and female gender (2%) were the predicting variables in multiple regression analysis. Health perception was not significantly related to the outcome variable.

Health Perception of Angioplasty Patients

A review of the literature elicited only a few articles which looked at the health perceptions of angioplasty patients. None of these looked specifically at the relationship between health perception and health-promoting behaviours.

Bliley and Ferrans (1993) examined perceived general health as an indicator of quality of life in 40 angioplasty patients. A paired t-test comparing health perception prior to and four to six weeks after angioplasty showed significant improvement in perceived general health ($t = 5.15$, $p < .0001$).

Perceived health status, measured by a four-point rating scale, was a significant predictor of quality of life, explaining 17% of the variance.

Health perception was one of three dependent variables studied six and twelve months following one of three treatments for CAD - bypass surgery (n = 26), angioplasty (n = 29), or drug therapy (n = 43) in elderly patients (Vogt, Funk, & Remetz, 1994). Health perception was measured by asking subjects to rate their health on a five-point Likert scale ranging from excellent to poor. Subjects were also asked to state whether they felt "better", "the same", or "worse" than before their treatment. Analysis of variance testing demonstrated that patients who had bypass surgery had significantly more positive health perceptions than subjects in the medication only group (F = 5.43, p = .006). The surgery group were also more likely to state they felt better following their treatment than the other two groups (χ^2 = 7.68, p = .022). The authors speculated that bypass surgery patients experienced more pain and discomfort related to the surgical nature of their treatment, and thus, any improvement was perceived as an increase in health status.

Summary

Health perception is not a well studied variable, particularly in the cardiac population. Results of studies in other populations suggest a very small or insignificant relationship between health perception and health-promoting

behaviours. Because of the belief that improved health status after angioplasty may reduce the stimulus to engage in risk factor modification, the relationship between health perception and health-promoting behaviours in angioplasty patients is an important area for nursing research.

Discussion

There are definite risk factors for CAD. Many of these risk factors, such as diet, smoking, hypertension, physical inactivity, stress, and diabetes, can be modified to reduce the impact of this disease. Non-modifiable risk factors such as age, sex, and family history are not amenable to change but should be considered as they suggest the need for more intensive therapy in relation to modifiable risk factors.

This review of the literature has shown that many people with CAD, including angioplasty patients, fail to initiate or maintain health-promoting behaviours which would improve their prognosis. It has also been shown that many factors influence the adoption and maintenance of health-promoting behaviours. Inconsistent findings from research in this area demonstrate that this process is not completely understood.

Methodological variations and study limitations may account for some of the inconclusive findings. A number of different instruments have been used to measure the concepts of social support, health perception and health-promoting

behaviours. Some of these tools have established reliability and validity in certain populations, others have been newly developed and not well tested. Sample size is small in a number of studies which can reduce the significance of the findings. Many studies related to CAD include subjects who have experienced MI, bypass surgery, or angioplasty. It is evident that these experiences are different and the populations should be studied separately. Differences in quantitative and qualitative findings demonstrate a need for further, more refined study. Finally, conceptual ambiguities may have contributed to the lack of conclusive findings. Health-promoting behaviours, health perception and social support have been defined and operationalized in different ways. Further research in this area can only enhance theory development and nursing practice.

Conceptual Framework

A number of models and theories from nursing and other disciplines have been developed and used as frameworks for explaining health behaviours. The Health Promotion Model (Pender, 1996) first appeared in the literature in the early 1980s. It has been recently revised based on findings from numerous research studies. This model incorporates nursing and behavioral science theory to provide a guide for exploring the determinants of health-promoting behaviour. Unlike the Health Belief Model, the focus is on health improvement

rather than the avoidance of disease.

There are three major components in this model: (a) individual characteristics and experiences, (b) behaviour-specific cognitions and affect, and (c) behavioural outcomes. Individual characteristics and experiences are the unique, personal factors that affect behaviour either directly, or indirectly through their influence on behaviour-specific cognitions and affect. Health perception, demographics, and illness-related variables would be included in this component. Behaviour-specific cognitions and affect are considered to be the major motivational factors in this model. This component includes the following variables: perceived benefits of action, perceived barriers to action, self-efficacy, activity-related affect, and interpersonal and situational influences. The third component, health-promoting behaviour, is preceded by commitment to a plan of action and influenced by competing demands and preferences.

The original model (Pender, 1987) was operationalized by studying its components in relation to such cardiovascular risk factors as diet, exercise, and stress management (Duffy, 1988; Pender, Walker, Sechrist, & Frank-Stromborg, 1990; Weitzel, 1989). As was illustrated in the previous review of literature on health-promoting behaviours, elements of the Health Promotion Model have been tested successfully in a number of studies. However, this model has been the subject of recent criticism.

Bottorff et al. (1996) tested the model in a sample of 1,339 female health

survey participants. The authors found that the Health Promotion Model did not fit the data from this study. Even when the model was modified, effects of the three variables tested were small or insignificant. Other studies indicated that the explanatory power of this model was poor and that modifying factors could actually have a direct effect on health-promoting behaviour (Johnson et al., 1993; Ratner, Bottorff, Johnson, & Hayduk, 1994).

The revised Health Promotion Model was chosen as a framework for this study for a number of reasons. Because patients who have had angioplasty have an existing illness, the focus should be on maintaining or improving health rather than reacting to the threat of illness. Second, the Health Promotion Model has been tested largely in well populations (Duffy, 1988; Weitzel, 1989; Pender et al., 1990) and should be tested in populations with health alterations such as CAD. Finally, the Health Promotion Model is a nursing model. Despite criticisms, research completed using this revised framework can contribute to nursing knowledge.

Definitions

The behavioural outcome variable investigated in this study is health-promoting behaviour. For the purpose of this study, health-promoting behaviour is defined as "a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and

fulfilment of the individual" (Pender, 1987, p. 42).

Social support is the behaviour-specific cognition and affect component explored in this study. Social support is defined as "interpersonal transactions that include one or more of the following: the expression of positive affect of one person toward another; the affirmation or endorsement of another person's behaviours, perceptions or expressed views; the giving of symbolic or material aid to another" (Kahn, 1979, p. 85).

The individual characteristics and experiences explored in this study are prior-related behaviour, health perception, demographics, and illness-related variables. Prior-related behaviour refers to health-promoting behaviours prior to angioplasty. Health perception is defined as the subjective assessment of one's current state of health (Pender, 1987). Demographics include age, gender, education and income. Illness-related variables refer to the length of time since diagnosis, number of comorbid illnesses, and presence of chest pain at follow-up. Relationships among the variables in the current study are depicted in Figure 1.

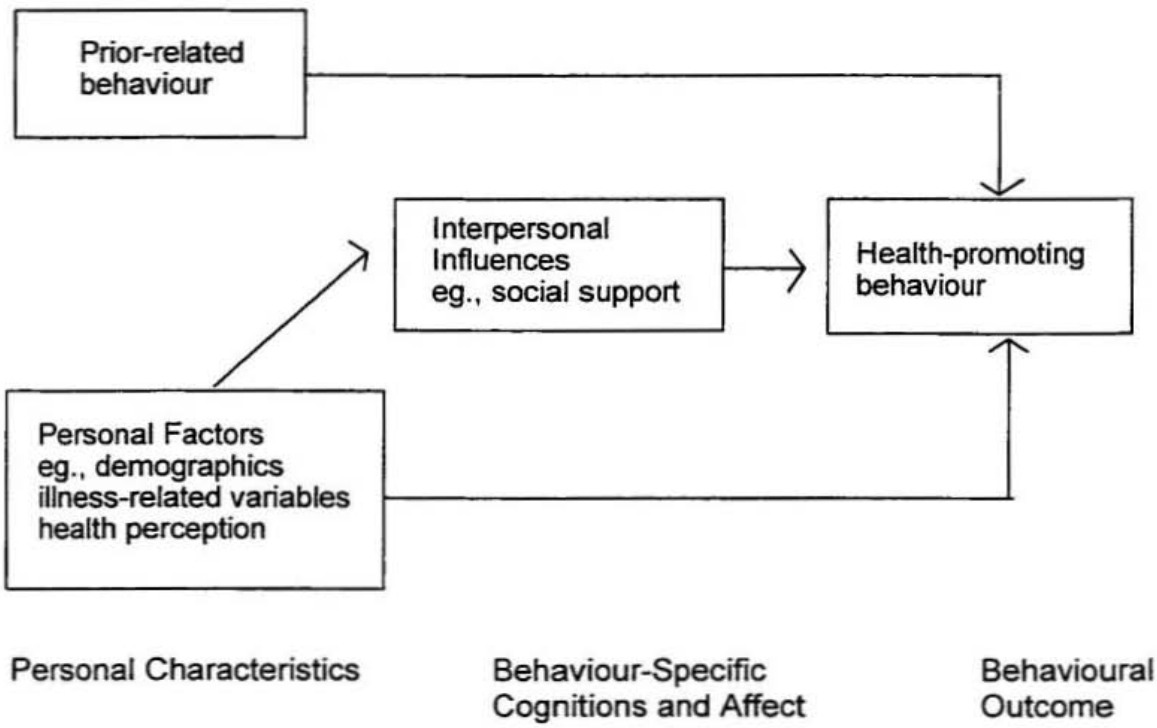

Figure 1. Proposed relationships among study variables.

CHAPTER 3

Methodology

A descriptive correlational study with a repeated measures design was used to investigate changes in health perceptions and health-promoting behaviours pre and post angioplasty. The relationships among social support, health perception, demographics, illness-related variables and health-promoting behaviours were also examined. This chapter provides an overview of the sample, setting, instruments, procedure, data analysis, limitations, and ethical considerations.

Sample

The target population was all patients who were to undergo angioplasty at a major teaching hospital under the Health Care Corporation of St. John's, Newfoundland. The accessible population was restricted to patients meeting the following inclusion criteria: (a) successful angioplasty - no immediate restenosis or need for bypass surgery, (b) mentally competent - able to give informed consent and understand the interview procedure, (c) physically able to engage in health-promoting activities - able to walk as a form of exercise, (d) a telephone at home - to complete the follow-up interview, (e) over the age of 19 years, and (f) able to understand and speak English.

In order to facilitate data collection within the projected time frame of six

months, a non-probability convenience sample was used rather than random selection. Seventy-three subjects met the inclusion criteria. One patient did not wish to participate. Two patients were discharged before the researcher could visit them for an interview.

The final sample size was 70 subjects at initial data collection. This number was within the desired sample size range of 63 to 88 subjects as determined by power analysis. That is a power level of .80, estimated effect of .30 and a significance level of .05 was used for the correlation coefficient component of the analysis; and a power level of .80, estimated effect of .50 and significance level of .05 for tests of difference (Polit & Hungler, 1995). At the time of the follow-up interview, the sample size fell to 65. Five subjects could not be contacted for the following reasons: (a) one was deceased, (b) two were ill, and (c) two had phone numbers no longer in service.

Setting

Subjects were interviewed initially during hospitalization following angioplasty. Interviews were conducted in private in subjects' rooms in either the coronary care or medical unit. One subject who was discharged earlier than expected was interviewed in his home.

Follow-up interviews were conducted by telephone starting at six weeks following angioplasty. This approach to data collection ensured that various

regions of the province were represented in the sample.

Procedure

Data were collected from May to October, 1996. Each subject was approached by the nurse manager or staff nurse in the cardiac catheterization laboratory prior to the scheduled angioplasty procedure. A brief description of the study was given and subjects were asked if they were willing to participate. Subjects were interviewed at least six hours following angioplasty to allow for recovery from medication administered during the procedure. Staff nurses were asked to assess the patient and ensure he/she was feeling well enough and agreeable to being interviewed.

Written consent was obtained following a complete explanation of the study and opportunity for questions (see Appendix A). All data collection instruments were administered at this time. Although the instruments were designed for self administration, to maintain consistency, an interview format was used to include subjects who could not read and facilitate the process for patients who were on complete bedrest. Interview time ranged from 20 to 60 minutes.

Follow-up telephone calls were initiated six weeks following angioplasty. Not all subjects were available at the six week interval due mainly to summer vacations. Time of contact ranged from six to seventeen weeks, with a mean

follow-up time of eight weeks. Only the Health Promoting Lifestyle Profile and health perception question were administered during the follow-up telephone contact. Subjects were also asked if they had experienced chest pain since the time of angioplasty.

Instruments

Four research instruments were used in this study. Three of the instruments were developed by other researchers and identified from a review of the literature. Permission to use these instruments in the current study was requested and received from appropriate persons. The remaining instrument was developed by the researcher for the present study.

Norbeck Social Support Questionnaire

Norbeck et al. (1981) used Kahn's (1979) conceptual definition of social support to construct the Norbeck Social Support Questionnaire (NSSQ). This instrument (see Appendix B) is designed to measure three functional aspects of social support (affect, affirmation, and aid) and five structural aspects (network size, source of support, duration of relationships, frequency of contact and network loss). Subjects are asked to identify social network members and rate the functional and structural aspects of their perceived support on a five-point Likert scale in a series of eight questions.

This instrument has demonstrated high internal consistency, with scores ranging from .72 to .97 (Norbeck et al., 1981; Hirth & Stewart, 1994). Test-retest reliability scores have also been high, ranging between .85 and .92 (Norbeck, Lindsey, & Carriere, 1983). This instrument has demonstrated concurrent validity with the Personal Resource Questionnaire and the Social Support Questionnaire (Norbeck et al., 1981) and predictive validity for stress as measured by the Life Experiences Survey (Norbeck et al., 1983). Construct validity was obtained by comparing the NSSQ with the Profile of Mood States (Norbeck et al., 1981). Further testing by Norbeck et al. (1983) established construct validity by comparing the instrument to converging constructs (need for inclusion and need for affection) and the discriminant construct (need for control). The NSSQ was revised in 1995 largely to facilitate data entry and analysis. Also, because empirical findings demonstrated multicollinearity between the affect and affirmation subscales, they were combined to create the emotional support subscale. Factor analysis based on a pooled population of 1,392 subjects confirmed a two factor solution (Norbeck, 1995).

Health Perception

This variable was assessed using the single item, "How would you rate your overall health at the present time?" Subjects were asked to rate their present health on a four-point scale ranging from poor to excellent. Several

studies have indicated that rating health perception in this manner is both reliable and reproducible (Bliley & Ferrans, 1993; Frank-Stromborg, Pender, Walker, & Sechrist, 1990). It has also been shown that self-rated health is significantly related to objective measures of health (Kaplan & Camacho, 1983; Riffle et al., 1989; Stuifbergen & Becker, 1994).

Demographic and Medical Profile

Demographic and medical history data were also collected from subjects (see Appendix C). Questions were asked regarding age, marital status, education, occupation, and income. A brief cardiac history was obtained on key factors (time since diagnosis, previous MI, CAGB, or angioplasty) as well as information regarding the presence of comorbid illnesses.

Health-Promotion Lifestyle Profile

The Health-Promoting Lifestyle Profile II (HPLP) is a 52-item behaviour rating scale developed to measure health-promoting behaviours (see Appendix D). The original Health-Promoting Lifestyle Profile became available in 1987 and has been used extensively. Based on the experience of the authors and feedback from users, the original 48-item instrument was revised to reflect current practice and also to achieve balance among the subscales (S. Walker, written communication, February, 1996). Behaviours are rated on a four-point

response scale ranging from never to routinely. Higher scores indicate more frequent performance of health-promoting behaviours. Both versions of the HPLP consist of six subscales - health responsibility, physical activity (previously called exercise), nutrition, interpersonal relations, spiritual growth (previously called self-actualization), and stress management.

Alpha reliability coefficients for the revised HPLP subscales range from .79 to .86 (S. Walker, written communication, February, 1996). Additional reliability and validity findings for the revised instrument are not currently available. Test-retest reliabilities for subscales from the original HPLP have been strong, ranging from .81 to .91 (Pender et al., 1990). Construct validity was supported by factor analysis with all items loading at a level of .35 or higher (Pender et al., 1990). Content validity was noted for the English version of the HPLP (Walker et al., 1987) as well as the Spanish version (Kuster & Fong, 1993).

Ethical Considerations

Several steps were taken to protect subject rights in this study. The Human Investigation Committee, Memorial University of Newfoundland (see Appendix E) and the Research Proposal Approval Committee of the Health Care Corporation of St. John's (see Appendix F) granted approval to conduct the study. Physicians who perform angioplasty, as well as the clinical chief of

cardiology, also gave support for the study (see Appendix G).

Participation in the study was voluntary. Nurses acted as intermediaries to inform patients about the study and ascertain their interest in participating. A complete explanation of the study was given by the researcher and opportunity for questions was provided before written consent was obtained. Subjects were given a copy of the consent form which contained the researcher's name and phone number and were encouraged to call if they had any questions or concerns.

Confidentiality was maintained by coding all forms and questionnaires. A log of names and corresponding codes was kept in a locked file cabinet accessible only to the researcher.

Data Analysis

Descriptive statistics were used to generate frequency tables and histograms of demographic variables. Relationships between independent and dependent variables were determined using correlation coefficients. Where the assumptions for Pearson's r were not met, the corresponding non-parametric tests were used. Paired t-tests were used to study changes in health perceptions and health-promoting behaviours from hospital stay to six weeks post-angioplasty. Alpha levels for tests of association and difference were set at .05.

Stepwise multiple regression was used to determine the best predictors of health-promoting behaviours. Only independent variables demonstrating a strong correlation with the dependent variables were entered into the regression equations. The internal consistency of the NSSQ and the HPLP was also assessed with Cronbach's alpha.

Limitations

The use of a non-probability convenience sample limits the generalizability of study findings to other angioplasty patients. Another identified limitation was the possibility for testing effects. The repeated measurement of health behaviours may have made individuals more aware of the importance of this issue and possibly led to increased use of positive behaviours more so than under normal circumstances.

Self-report of health behaviours may also threaten the reliability and validity of findings. Ensuring responses were confidential may have minimized this limitation. The accuracy of self-report for the HPLP was supported by the relatively large amount of noncompliance reported at both measurement times.

CHAPTER 4

Results

Study findings are presented in three sections. The first section presents a descriptive profile of the sample and study variables. The second section describes the relationships between the variables under study, including the results of multiple regression analysis on health-promoting behaviours. Finally, the reliability and validity of the instruments are reviewed.

Descriptive Profile

This section presents an overview of the major study findings on sample characteristics - demographic and illness-related variables. Descriptive findings are also presented on health perception, social support, and health-promoting behaviours.

Demographics

Table 1 summarizes select socio-demographic variables. The majority were male (78.6%), married (90%) and between the ages of 45 and 64 (64.7%). The mean age was 57.13 years. Most of the subjects (65.7%) had not completed high school, and only 20% had post-secondary education. The majority were either employed (40.6%) or retired (34.8%), and had annual family incomes less than $40,000 (74.2%).

Table 1

Description of the Sample

Characteristic	n	%
Gender (N=70)		
Male	55	78.6
Female	15	21.4
Age in Years (N=68)		
<45	6	8.8
45-54	23	33.8
55-64	21	30.9
≥65	18	26.5
Marital Status (N=69)		
Single	2	2.8
Married	62	90.0
Widowed	2	4.4
Divorced/Separated	2	2.8
Education Level (N=70)		
Seventh grade or less	14	20.0
Some high school	32	45.7
High school graduate	10	14.3
Post-secondary education	14	20.0
Occupation (N=69)		
Employed	28	40.6
Retired	24	34.8
Unemployed	6	8.7
Homemaker	11	15.9
Income (N=66)		
<20,000	21	31.8
20,000-40,000	28	42.4
>40,000	17	25.8

Illness-Related Variables

The time since diagnosis ranged from current admission to 25 years, with the majority (60%) diagnosed within the previous two years. This was the first angioplasty for most (78.6%), approximately one-half had experienced a previous myocardial infarction, and 15.7% had previously undergone coronary artery bypass graft surgery. At follow-up, 40% of subjects were still experiencing chest pain. A summary of illness-related variables for this sample is presented in Table 2.

Social Support

The Norbeck Social Support Questionnaire (NSSQ) was administered during hospitalization to assess the structural and functional aspects of social support (see Appendix B). The structural aspects of support refer to the network size, sources, duration of relationships, frequency of contacts, and loss of supportive persons. The functional components of social support are emotional (affect, affirmation) and tangible (aid) support.

Structural support. Descriptive data on the structural aspects of support are presented in Table 3. The number of support persons listed for each subject ranged from 1 to 27 ($\underline{M}$ = 9.8). The average number varied for males ($\underline{M}$ = 9.2) and females ($\underline{M}$ = 12). The majority of support persons were relatives (75.3%), with spouses accounting for 9.1% of the total network. Additional support

Table 2

Illness-Related Characteristics (N=70)

Characteristic	n	%
Time since diagnosis		
<1 month	17	24.3
2-11 months	17	24.3
1-2 years	8	11.4
3-10 years	15	21.4
>10 years	13	18.6
Number of Coexisting Illnesses		
0	11	15.7
1	21	30.0
2	15	21.4
3	13	18.6
>4	19	14.3
Previous Angioplasty		
0	55	78.6
1	11	15.7
>2	4	5.7
Previous CABG Surgery		
0	59	84.3
1	8	11.4
>2	3	4.3
Previous Myocardial Infarction		
0	35	50.0
>1	35	50.0
Chest Pain at Follow-up	26	40.0

Table 3

Norbeck Social Support Questionnaire Results (N = 70)

Variable	M	SD	Range
Total Network	97.87	62.57	11-297
Number Listed	9.80	6.11	1-27
Frequency	40.56	26.85	5-135
Duration	47.51	30.27	5-135
Total Functional Support	198.77	132.66	23-617
Emotional	131.28	87.24	15-410
Tangible	67.59	46.36	6-207
Total Loss	1.29	2.46	0-9

persons included friends (12.9%), health care personnel (4.2%), and clergy (3.9%). Neighbours, work and school associates and "other" made up the remaining 3.7% of support networks. The network size for the study group is slightly below normative values reported for males (M = 10.6) and slightly above those for females (M = 10.9) (Norbeck, 1995).

Frequency of contact with support persons was rated on a 5-point scale, ranging from daily (5) to once a year or less (1). Cumulative scores for each subject ranged from 5 to 135 (M = 40.56). Higher scores indicate more frequent contacts with support persons. Because these scores do not reflect actual time periods, the frequency of contact scores were divided by the total number of supports listed for each subject to generate a mean score. The average score for males was 4.11 and females 4.28. The resulting mean score average for the total sample (M = 4.14) indicated that subjects had weekly contact with support persons. This contact could be in person, by letter or by telephone.

Duration of relationships was rated on a 5-point scale, ranging from more than five years (5) to less than six months (1). Cumulative scores for each subject ranged from 5 to 135 (M = 47.51) with higher scores indicating more long term relationships. Because these scores do not reflect actual time periods, the duration of relationship scores were divided by the total number of support persons listed for each subject. The average score for males was 4.91 and females 4.66. The resulting mean score average for the total sample (M = 4.85)

indicated that subjects had maintained relationships with identified support persons for more than five years.

The total network score is a composite of number of support persons, frequency of contacts and duration of relationships. Scores for this variable ranged from 11 to 297 (M = 97.87). The observed gender differences in the average scores suggest that female participants (M = 119.67) perceived their support network to be larger than males (M = 92.93). These findings were higher than the normative values for males (M = 95.0) and females (M = 98.5) reported by Norbeck (1995).

Only 13 males (23.6%) and 3 females (20%) had experienced the loss of one or more support persons in the previous year due to a move, job changes, divorce, separation, or death. This was considerably less than the normative values for males (36.3%) and females (44.1%) reported by Norbeck (1995).

Functional support. Descriptive data on the functional aspects of support are summarized in Table 3. Emotional and tangible support were rated on a 5-point scale, ranging from a great deal (4) to not at all (0). Higher scores denote greater perceived emotional and tangible support from persons in the network.

The emotional support variable elicited information on the degree to which support persons made the subject feel liked/loved and respected/admired, served as confidants, and agreed with subjects' actions or thoughts. Emotional

support scores range from 14 to 410 (M = 131.3). There were notable differences between male and female ratings of emotional support, with scores ranging from 15 to 320 (M = 122.91) and 16 to 410 (M = 162) respectively. Reported normative mean values were slightly lower for males (M = 119.3) and considerably lower for females (M = 127.2) (Norbeck, 1995).

The tangible support variable measured subjects' perceptions of the availability of support persons to provide assistance if needed. Scores for the total sample ranged from 6 to 207 (M = 67.49). The large differences noted in average scores between males (M = 63.33) and females (M = 82.73) in the study population did not concur with the normative values reported for males (M = 55.3) and females (M = 53.1) by Norbeck (1995).

In order to construct a meaningful context for the emotional and tangible support scores, a mean rank was derived by dividing total scores by the number of support persons for each subject. The findings suggest that, on average, subjects believed that support persons in their networks provided "quite a bit" of emotional (3.3) and tangible (3.4) support.

Total functional support scores, a composite of emotional support and tangible support, ranged from 23 to 617 (M = 198.8). With regard to gender differences, male scores ranged from 23 to 463 (M = 186.24) and female scores from 24 to 617 (M = 244.73). Because higher scores suggest more perceived support, females believed that they received more tangible support from support

persons in their networks than males. Again normative mean values are slightly lower for males (M = 173.6) and much lower (M = 179.4) for females (Norbeck, 1995).

Subjects in this study reported both structural and functional support as being comparable to or higher than normative scores. Although there were differences between male and female scores, none of these differences reached statistical significance ($p > .05$). Because of the small number of females in this study, these findings should be interpreted cautiously.

Health Perception

The mean scores for health perceptions at the time of angioplasty and follow-up are presented in Table 4. Health perception was measured on a 4-point scale ranging from poor (1) to excellent (4).

At the time of angioplasty the majority of subjects (61.6%) rated their health as poor or fair. This number had declined to 46.1% by eight-weeks follow-up. The mean scores suggest that health perceptions were more positive at follow-up (M = 2.68) than at the time of angioplasty (M = 2.33). The observed improvement in health perception over time was statistically significant ($t = -2.87$, $p = .006$). The moderate correlation ($r = .53$, $p < .000$) indicates that 28.1% of the observed variance in health perception at follow-up was explained by health perception ratings at the time of angioplasty.

Health-Promoting Behaviours

The Health-Promoting Lifestyle Profile II (HPLP) was used to assess health-promoting behaviours in six content domains: interpersonal relations (IPR), spiritual growth (SG), health responsibility (HR), physical activity (PA), nutrition (Nut), and stress management (SM) (see Appendix D). Items were rated with a Likert-type scale ranging from never (1) to routinely (4). Mean scores were computed to facilitate comparisons of subscale and composite scores (see Table 4). With the exception of physical activity which was lower, HPLP subscale scores at the time of angioplasty were comparable to the normative data for a sample of 589 employees prior to participation in a health-promotion program (total score = 2.82, IPR = 3.14, SG = 3.24, SM = 2.42, Nut = 2.66, HR = 2.23, PA = 3.24) (Pender et al., 1990).

At the time of angioplasty and follow-up, subjects scored highest on interpersonal relationships and spiritual growth, and lowest on physical activity and health responsibility. These findings suggest that study subjects were more likely to engage in behaviours that enhance a sense of intimacy and closeness and a sense of purpose, and reduce stress than behaviours directed towards improving nutrition, increasing physical activity or assuming greater responsibility for health.

Besides maintaining a consistent pattern in high to low ratings over time, there was a statistically significant increase ($p < .001$) in total scale and

Table 4

Health Perception and Health-Promoting Behaviour Scores at Time of Angioplasty and Follow-up

Variable	Time 1 (N=70) Mean (SD)	Time 2 (N=65) Mean (SD)	r	t
Health Perception	2.33 (.81)	2.68 (.83)	.53***	-2.87**
HPLP Total Score	2.74 (.45)	3.10 (.38)	.52***	-7.24***
Interpersonal Relations	3.28 (.48)	3.60 (.38)	.29*	-5.06***
Spiritual Growth	3.20 (.52)	3.43 (.48)	.43***	-3.64***
Stress Management	2.84 (.62)	3.26 (.55)	.44***	-5.50***
Nutrition	2.56 (.61)	3.05 (.58)	.53***	-6.94***
Health Responsibility	2.37 (.60)	2.81 (.60)	.66***	-7.23***
Physical Activity	2.10 (.71)	2.57 (.74)	.52***	-5.10***

*p<.05 **p<.01 ***p<.001

subscale scores from the time of angioplasty to eight-weeks follow-up (see Table 4). This suggests that subjects were engaging in health-promoting behaviours more frequently following angioplasty than they had been prior to the procedure.

The significant correlations between total and subscale scores at time one and time two indicate that previous behaviours had some influence on new health-promoting behaviours. However, the effects were low to moderate. The total HPLP score at the time of angioplasty accounted for 27% of the variance for the HPLP score at follow-up. The amount of variance for the subscale scores at follow-up explained by the initial subscales scores was 43.6% for health responsibility, 28.1% for nutrition, 27% for physical activity, 19.4% for stress management, 18.5% for spiritual growth, and 8.4% for interpersonal relations.

Interrelationships Among Study Variables

This section explores the relationships between the key predictor and outcome variables as postulated by the Health Promotion Model. The first three subsections present the findings on the relationships between health promoting behaviours and social support and personal factors (i.e., health perception, demographics, illness-related characteristics). The remaining sections address the interrelationships among independent or predictor variables.

It was also noted on closer scrutiny that male scores differed from total sample scores on social support, health perception, and health-promoting

behaviour variables. Although there was no statistically significant difference based on gender, this could have been an artifact of the small number of females in the sample. Given these observed differences the decision was made to examine the relationships among these variables for males separate from the total sample.

Social Support and Health-Promoting Behaviours

Spearman's rho and Kendall's tau were applied to the data in addition to Pearson's r because of the slight positive skewness noted with the social support variables. Because there were no appreciable differences, the results of the more robust test are reported here. Because the total loss variable only applied to 22.9% of the sample and was severely skewed, this variable was not included in the analysis.

Total sample. At the time of angioplasty, there were positive relationships between the total HPLP scores and functional and structural social support, but none achieved statistical significance (see Table 5). Interpersonal relations demonstrated significant positive correlations with emotional support, $r = .28$, $p = .02$, tangible support, $r = .29$, $p = .02$, the total number listed $r = .29$, $p = .02$, duration of relationships, $r = .26$, $p = .03$, and frequency of contact, $r = .26$, $p = .03$. The findings suggest that subjects with strong functional and structural support systems were more likely to engage in activities that enhanced feelings

Table 5

Correlations Among Health Perception, Social Support, and Health-Promoting Behaviours at Time of Angioplasty

Variable	HPLP	HR	PA	SG	IPR	SM	Nut
	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
HP1	.19 (.13)	.06 (.61)	.33** (.007)	.19 (.13)	.14 (.26)	.00 (.99)	.13 (.30)
Structural	.18 (.13)	.01 (.92)	.10 (.39)	.20 (.10)	.27* (.03)	.14 (.24)	.14 (.28)
Number	.20 (.10)	.03 (.84)	.10 (.42)	.20 (.09)	.29* (.02)	.17 (.15)	.16 (.19)
Duration	.18 (.13)	.01 (.94)	.11 (.38)	.21 (.09)	.26* (.03)	.13 (.28)	.15 (.21)
Frequency	.17 (.16)	.01 (.91)	.10 (.41)	.18 (.14)	.26* (.03)	.14 (.24)	.11 (.35)
Functional	.17 (.16)	.00 (.99)	.07 (.59)	.19 (.12)	.28* (.02)	.14 (.23)	.13 (.29)
Emotional	.18 (.13)	.01 (.91)	.08 (.52)	.19 (.11)	.28* (.02)	.16 (.20)	.15 (.22)
Tangible	.14 (.25)	-.02 (.86)	.04 (.75)	.17 (.16)	.29* (.02)	.16 (.32)	.15 (.47)

Note. HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; PA=Physical Activity; SG=Spiritual Growth; IPR=Interpersonal Relations; SM=Stress Management; Nut=Nutrition; HP=Health Perception; Structural=Total Network Support; Number=Number of Supports Listed; Duration=Duration of Relationships; Frequency=Frequency of Contact; Functional=Total Functional Support; Emotional=Emotional Support; Tangible=Tangible Support.

*$p<.05$ **$p<.01$

of intimacy and closeness.

At follow-up, functional and structural social support remained positively correlated with the HPLP total scores but still did not achieve statistical significance (see Table 6). Further, social support variables were no longer significantly correlated with interpersonal relations. The only significant relationship at this time was between emotional support and spiritual growth, r = .25, p = .04. This finding suggests that subjects with stronger emotional support tended to have a greater sense of purpose.

Male subgroup. At the time of angioplasty, there were positive relationships between the total HPLP scores and the functional and structural social support variables, but lower in magnitude than the total sample (see Table 7). The significant relationships observed between interpersonal relations and emotional support, duration and frequency of contact were not supported in the male group. However, interpersonal relations was significantly correlated with tangible support, r = .27, p = .05, and the total number listed, r = .26, p = .05. In contrast to the total sample, a statistically significant relationship was observed between spiritual growth and the total number listed, r = .27, p = .04.

At follow-up, the functional and structural social support variables remained positively correlated with the HPLP total scores but again, lower in magnitude than the total sample (see Table 8). As observed with the total

Table 6

Correlations Among Health Perception, Social Support and Health-Promoting Behaviours at Follow-up

Variable	HPLP	HR	PA	SG	IPR	SM	Nut
	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
HP2	.28* (.02)	.11 (.39)	.26** (.04)	.37* (.003)	.02 (.86)	.16 (.20)	.17 (.17)
Structural	.16 (.19)	-.11 (.37)	.20 (.11)	.23 (.07)	.13 (.32)	.04 (.75)	.22 (.08)
Number	.16 (.22)	-.10 (.42)	.20 (.15)	.22 (.08)	.10 (.44)	.04 (.74)	.23 (.07)
Duration	.16 (.20)	-.13 (.32)	.19 (.12)	.24 (.07)	.13 (.31)	.03 (.84)	.23 (.07)
Frequency	.16 (.19)	-.10 (.43)	.20 (.10)	.21 (.09)	.13 (.31)	.06 (.65)	.20 (.12)
Functional	.15 (.23)	-.11 (.36)	.15 (.24)	.24 (.06)	.12 (.34)	.07 (.59)	.21 (.09)
Emotional	.17 (.18)	-.10 (.43)	.16 (.20)	.25* (.04)	.13 (.32)	.08 (.54)	.21 (.09)
Tangible	.11 (.35)	-.14 (.26)	.12 (.33)	.21 (.09)	.11 (.38)	.05 (.70)	.20 (.12)

Note. HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; PA=Physical Activity; SG=Spiritual Growth; IPR=Interpersonal Relations; SM=Stress Management; Nut=Nutrition; HP=Health Perception; Structural=Total Network Support; Number=Number of Supports Listed; Duration=Duration of Relationships; Frequency=Frequency of Contact; Functional=Total Functional Support; Emotional=Emotional Support; Tangible=Tangible Support.

*$p<.05$ **$p<.01$

Table 7

Correlations Among Health Perception, Social Support and Health-Promoting Behaviour of Male Subgroup at Time of Angioplasty

Variable	HPLP Total and Subscale Scores						
	HPLP	**HR**	**PA**	**SG**	**IPR**	**SM**	**Nut**
	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
HP1	.12 (.39)	-.04 (.77)	.22 (.11)	.21 (.13)	.10 (.47)	-.09 (.53)	.14 (.33)
Structural	.11 (.41)	-.13 (.33)	.02 (.86)	.25 (.06)	.23 (.09)	.04 (.75)	.11 (.42)
Number	.14 (.33)	-.11 (.43)	.01 (.92)	.27* (.04)	.26* (.05)	.06 (.67)	.13 (.34)
Duration	.14 (.33)	-.11 (.40)	.04 (.77)	.26 (.06)	.24 (.08)	.06 (.66)	.14 (.30)
Frequency	.08 (.58)	-.16 (.24)	.01 (.96)	.23 (.09)	.21 (.12)	.02 (.90)	.06 (.65)
Functional	.11 (.43)	-.12 (.37)	-.02 (.90)	.25 (.06)	.26* (.05)	.04 (.78)	.10 (.46)
Emotional	.12 (.39)	-.11 (.42)	.00 (.98)	.26 (.06)	.25 (.06)	.04 (.76)	.12 (.38)
Tangible	.08 (.54)	-.15 (.29)	-.05 (.71)	.24 (.08)	.27* (.05)	.03 (.82)	.07 (.63)

Note. HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; PA=Physical Activity; SG=Spiritual Growth; IPR=Interpersonal Relations; SM=Stress Management; Nut=Nutrition; HP=Health Perception; Structural=Total Network Support; Number=Number of Supports Listed; Duration=Duration of Relationships; Frequency=Frequency of Contact; Functional=Total Functional Support; Emotional=Emotional Support; Tangible=Tangible Support.

*$p<.05$ **$p<.01$

Table 8

Correlations Among Health Perception, Social Support and Health-Promoting Behaviour of Male Subgroup at Time of Follow-up

Variable	HPLP Total and Subscale Scores						
	HPLP	**HR**	**PA**	**SG**	**IPR**	**SM**	**Nut**
	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
HP2	.31* (.02)	.19 (.18)	.20 (.15)	.38** (.007)	.01 (.97)	.22 (.12)	.24 (.09)
Structural	.13 (.38)	-.27 (.06)	.05 (.72)	.26 (.06)	.15 (.31)	.03 (.86)	.40** (.004)
Number	.12) (.40)	-.24 (.09)	.02 (.86)	.26 (.06)	.14 (.33)	.01 (.92)	.40** (.004)
Duration	.13 (.36)	-.25 (.08)	.05 (.74)	.27 (.06)	.14 (.33)	.02 (.90)	.41** (.003)
Frequency	.12 (.41)	-.28* (.04)	.06 (.68)	.25 (.06)	.15 (.29)	.03 (.81)	.38** (.007)
Functional	.11 (.43)	-.26 (.07)	-.01 (.95)	.28* (.05)	.16 (.26)	.05 (.70)	.38** (.006)
Emotional	.14 (.33)	-.24 (.10)	.01 (.94)	.30* (.03)	.17 (.24)	.06 (.64)	.39** (.005)
Tangible	.06 (.66)	-.30* (.03)	-.05 (.75)	.23 (.10)	.14 (.31)	.03 (.83)	.35* (.01)

Note. HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; PA=Physical Activity; SG=Spiritual Growth; IPR=Interpersonal Relations; SM=Stress Management; Nut=Nutrition; HP=Health Perception; Structural=Total Network Support; Number=Number of Supports Listed; Duration=Duration of Relationships; Frequency=Frequency of Contact; Functional=Total Functional Support; Emotional=Emotional Support; Tangible=Tangible Support.

*$p<.05$ **$p<.01$

sample, no social support variables were significantly related to interpersonal relations. However, significant relationships were found between spiritual growth and emotional support, r =.30, p = .03; and nutrition and the total number listed, r = .40, p = .004, duration, r = .41, p = .003, frequency of contact, r = .38, p = .007, emotional support, r = .39, p = .005, and tangible support, r = .35, p = .01. These findings suggest that men with stronger emotional support tended to have a greater sense of purpose; and those with greater functional and structural supports were more likely to engage in healthier nutritional practices.

Other significant differences were observed with the male sub-grouping at follow-up (see Table 8). Health responsibility depicted negative correlations with all social support variables, achieving statistical significance with frequency of contact, r = -.28, p=.04, and tangible support, r = -.30, p = .03. That is, male subjects who had more frequent contact with members of their support networks and received more assistance from support persons were less likely to assume personal responsibility for health.

Health Perception and Health-Promoting Behaviours

Pearson's r was used to determine the relationship between health perception and health-promoting behaviours. At the time of angioplasty, health perception demonstrated small but positive relationships with the total HPLP scale and subscale scores for both the total sample (see Table 5) and male

subgroup (see Table 7). However, health perception only achieved statistical significance with the physical activity subscale for the total sample, $r = .33$, $p = .007$, but not for the male subgroup, $r = .22$, $p = .11$. This finding suggests that subjects who viewed their health positively were more inclined to engage in physical activities.

At eight-weeks follow-up, health perception demonstrated significant positive correlations with health-promoting behaviours in the total sample (see Table 6) and male subgroup (see Table 8). Sample subjects who had positive health perceptions were more likely to engage in overall health promoting behaviours, $r = .28$, $p = .02$, especially physical activity, $r = .26$, $p = .04$, and spiritual growth, $r = .37$, $p = .003$. Similar relationships were identified in the male subgroup for overall health-promoting behaviours, $r = .31$, $p = .02$, and spiritual growth, $r = .38$, $p = .007$, but not for physical activity, $r = .20$, $p = .15$. Again, despite significant relationships, the correlations were low with health perception in the total sample explaining 7.8%, 6.8% and 13.7% of the observed variance in total HPLP scores, physical activity and spiritual growth, respectively.

Personal Factors and Health-Promoting Behaviours

Pearson's r and analysis of variance were used to explore significant relationships or differences for sample characteristics and health-promoting behaviours at the time of angioplasty and at follow-up. Nonparametric tests were

also applied to the data where appropriate.

Sociodemographic variables. At the time of angioplasty, no significant group differences in HPLP scores were observed for education, gender or income. Age demonstrated statistically significant positive correlations with the total HPLP score, $r = .32$, $p = .008$, spiritual growth, $r = .37$, $p = .002$, interpersonal relationships, $r = .35$, $p = .004$, and stress management, $r = .35$, $p = .004$. These findings suggest that older subjects were more likely to engage in health promoting activities, especially those that provided a greater sense of purpose, enhanced feelings of intimacy and closeness, and facilitated stress management.

At follow-up, age demonstrated a statistical significant relationship with interpersonal relations, $r = .30$, $p = .02$, and females scored significantly higher than males on health responsibility, $t = -2.74$, $p = .008$. These findings suggest that older subjects were more likely to engage in activities that enhanced feelings of intimacy and closeness than younger subjects; and women tended to assume greater responsibility for their health than men. There were no significant group differences observed for education, occupation, and income on HPLP total or subscale scores.

Illness-related variables. There were few statistically significant results when health-promoting behaviours were examined in relation to the illness-related variables. At the time of angioplasty, subjects who had been diagnosed

longer scored higher on the spiritual growth subscale, $F = 3.30$, $p = .03$. At follow-up, this difference no longer existed.

At follow-up, subjects who had been diagnosed longer had significantly higher interpersonal relation scores, $F = 5.89$, $p = .001$. Also, subjects with a greater number of comorbid illnesses were less likely to participate in physical activities, $F = 3.39$, $p = .02$.

Social Support and Health Perception

The expected relationships between the social support variables and health perceptions, as postulated by the Health Promotion Model, received minimal support from this study's findings (see Table 9). At the time of angioplasty, health perception demonstrated significant positive correlations with tangible support, $r = .26$, $p = .04$, and duration of relationships, $r = .24$, $p = .05$. These significant relationships suggest that subjects who rated their health more positively were more likely to report having longer relationships with support persons and receiving greater assistance from them. However, at follow-up the only support variable demonstrating a significant relationship with health perception was duration of relationships, $r = .27$, $p < .05$.

Table 9

Correlations Between Health Perception and Social Support

Variable	Time 1 (N=70)	Time 2 (N=65)
	HP1 r (p)	HP2 r (p)
Structural	22 (.07)	23 (.06)
Number	23 (.07)	23 (.06)
Duration	24* (.05)	27* (.03)
Frequency	20 (.11)	17 (.17)
Functional	22 (.07)	17 (.07)
Emotional	20 (.11)	15 (.22)
Tangible	26* (.04)	19 (.12)

Note. HP= Health Perception; Structural=Total Network Support; Number=Number of Supports Listed; Duration=Duration of Relationships; Frequency=Frequency of Contact; Functional=Total Functional Support; Emotional=Emotional Support; Tangible=Tangible Support.

*$p \leq .05$

Personal Factors and Health Perception

Appropriate parametric and non-parametric tests of association and difference were used to examine the impact, if any, of personal factors on health perceptions. Although not specified as exerting a major confounding influence in the revised Health Promotion Model, this information is needed to avoid problems posed by high intercorrelations among independent variables when performing regression analysis.

Sociodemographic variables. At the time of angioplasty, subjects with higher incomes rated their health more positively than those with lower incomes, $F = 3.3$, $p = .04$. Also subjects with higher education perceived their health more positively than those with less education, $F = 71.80$, $p = .007$. The documented differences in health perceptions based on income and education persisted at follow-up, $F = 4.4$, $p = .02$, and $F = 24.82$, $p = .000$, respectively. There were no significant differences in health perceptions for age or gender subgroupings at the time of angioplasty or follow-up.

Illness-related variables. Subjects with more co-existing illnesses had significantly poorer health perceptions at the time of angioplasty, $F = 3.44$, $p = .02$, and at follow-up, $F = 5.16$, $p = .003$. Also, subjects who reported experiencing chest pain at follow-up tended to rate their health less positively than those not experiencing chest pain, $F = 41.21$, $p < .000$. There were no significant differences in health perception in terms of length of time since

diagnosis.

Personal Factors and Social Support

According to the Health Promotion Model, social support can be influenced by such personal factors as demographics and illness-related variables. As stated previously, female subjects scored higher on social support variables but the differences were not significant. In this study, there were no significant relationships between social support variables and age, income, education, time since diagnosis and number of co-existing illnesses.

Predictors of Health-Promoting Behaviours

Step-wise multiple regression was used to determine the predictors of health-promoting behaviour at the time of angioplasty and at eight-weeks follow-up. The presentation of multiple regression results is restricted to outcome variables that had two or more predictor variables in the regression equation.

Time of Angioplasty

Age surfaced as the only variable that depicted a significant correlation with the total HPLP score at the time of angioplasty. Thus, multiple regression could not be used with this data.

There were, however, significant correlations observed between

interpersonal relations and social support, age, and time since diagnosis. Due to the strong intercorrelations among the social support variables, only total functional support was entered into the regression equation along with age in years and time since diagnosis. Results of the multiple regression analysis are summarized in Table 10. Age entered the equation first, accounting for 10.82% of the variance in interpersonal relations, $F = 9.07$, $p = .004$. This variable was followed by total functional support which accounted for an additional 8.11% of the variance, $F = 8.82$, $p = .000$. Time since diagnosis failed to enter the regression equation.

Follow-up

The total and subscale scores of the HPLP at the time of angioplasty and health perception at follow-up demonstrated a positive correlation with total HPLP scores at follow-up. Results of this multiple regression analysis are summarized in Table 10. Health responsibility at the time of angioplasty entered the equation at step one accounting for 32.53% of the variance in health-promoting behaviours, $F = 31.85$, $p = .000$. At step two, health perception at follow-up entered the regression equation, accounting for an additional 4.21% of the variance, $F = 19.58$, $p = .000$. Total HPLP score and the five remaining subscale scores failed to enter the equation.

Table 10

Stepwise Multiple Regression on Health-Promoting Behaviours (N=65)

	Multiple R	Adjusted R^2	R^2 change	F Value	p
Variable		**IPR (Time 1)**			
Age	.3476	.1082	.1082	9.07	.004
Functional	.4621	.1893	.0811	8.82	.000
		HPLP Total Score (Time 2)			
HR1	.5795	.3253	.3253	31.85	.000
HP2	.6222	.3674	.0421	19.58	.000
		PA (Time 2)			
PA1	.5171	.256	.2560	22.99	.000
Comorbid	.5625	.2943	.0383	14.35	.000

IPR=Interpersonal Relations; Functional=Total Functional Support; HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; HP=Health Perception; PA=Physical Activity; Comorbid=Comorbid Illnesses.

Physical activity at angioplasty, health perception at follow-up, and number of co-existing illnesses demonstrated a significant correlation with physical activity at follow-up. Results of the multiple regression analysis are summarized in Table 10. Physical activity at angioplasty entered the equation at step one accounting for 25.6% of the variance in physical activity at follow-up, $F = 22.99$, $p = .000$. At step two, co-existing illnesses entered the equation, accounting for an additional 3.83% of the variance, $F = 14.35$, $p = .000$. Health perception at follow-up failed to enter the regression equation.

Reliability and Validity of Study Instruments

The reliability and validity of the HPLP and NSSQ were also examined for the study population. Cronbach's alpha was used to assess internal consistency, and intercorrelations among subscales and total scores to assess validity.

HPLP

Findings at both measurement times were comparable, therefore only those from the second administration are reported. The total instrument had an alpha coefficient of .92, indicating a high level of internal consistency. Alpha coefficients for the six subscales ranged from .69 to .82: physical activity (.82), interpersonal relations (.80), spiritual growth (.78), health responsibility (.78), stress management (.76), and nutrition (.69). These findings indicate that the

subscales and total scale evidenced good internal consistency.

The first step in determining construct validity is examining the intercorrelations among subscales. All subscales correlated strongly with the total score (see Table 11). Thirteen of the fifteen correlations among the subscales were within the low to moderate range indicating that subscales were related and represented distinct dimensions of health-promoting behaviour.

NSSQ

For the NSSQ, the alpha coefficient was .98 for the total instrument, .99 for the emotional support subscale, and .97 for the tangible support subscale. The extremely high intercorrelations among the subscales (r ranging from .96 to .99) suggest that subscales are redundant and not providing any new information. The instrument may actually be measuring only one aspect of social support.

Summary

This group of angioplasty patients, particularly the females, had more social support and experienced less losses in comparison to normative data from the NSSQ. Social support, as measured in this study, did not have a significant impact on overall health-promoting behaviours at the time of

Table 11

Correlations Among HPLP Subscales (N=65)

Variable	PA	SG	IPR	SM	Nut	Total
HR	.38**	.34*	.42***	.51***	.36**	.74***
PA		.24	.23	.40***	.37**	.70**+
SG			.57***	.46***	.28**	.66***
IPR				.44***	.19	.63***
SM					.32**	.74***
Nut						.63***

Note: HPLP=Health-Promoting Lifestyle Profile; HR=Health Responsibility; PA=Physical Activity; SG=Spiritual Growth; IPR=Interpersonal Relationships; SM=Stress Management; Nut=Nutrition; Total=HPLP Mean Score.

*p<.05 **p<.01 ***p<.001

angioplasty or at follow-up. There were low significant correlations between social support variables and interpersonal relations at the time of angioplasty and between emotional support and spiritual growth at follow-up.

Health perception for this group increased significantly from the time of angioplasty to the time of follow-up. Positive health perception at the time of angioplasty was significantly related to the physical activity subscale of the HPLP. At follow-up, positive health perception was significantly related to the total HPLP score as well as the physical activity and spiritual growth subscales but explained only a small proportion of the variance.

Health-promoting behaviours for this sample, with the exception of physical activity, are comparable to normative data. Health-promoting behaviours increased significantly from the time of angioplasty to follow-up. The health responsibility subscale of the HPLP and health perception were significant predictors of overall health-promoting behaviour at follow-up, accounting for 36.7% of the variance.

The only demographic variable significantly related to health-promoting behaviours was age. Age was positively correlated with total HPLP and three subscale scores at the time of angioplasty but only one subscale score at follow-up. There were significant differences in health perception based on income and education. Higher income and education levels were associated with more positive health perception.

CHAPTER 5

Discussion

The revised Health Promotion Model (Pender, 1996) provided the conceptual framework for the problem under investigation in this study. The discussion of the findings is presented according to the three major components of the model: individual characteristics and experiences, behaviour-specific cognitions and affect, and behavioral outcome.

In the Health Promotion Model (HPM), individual characteristics and experiences and behaviour specific cognitions and affect are postulated to exert a direct and indirect effect on behavioral outcome. For the current study, the direct and indirect effects of individual characteristics and experiences were considered, but only the direct effects of behaviour-specific cognitions and affect. The aspects of individual characteristics and experiences selected for investigation were personal factors (i.e., perceived health status, sociodemographic and illness-related variables) and prior related behaviour (health-promoting behaviours prior to angioplasty). Measures of social support assessed interpersonal influence, and angioplasty the situational influence aspects of the behaviour-specific cognitions and affect component. Health-promoting behaviours measured behavioral outcome.

Behavioural Outcome

The mean scores for the HPLP and individual subscales at the time of angioplasty approximate values reported for middle-aged and older adults (Walker, Volkan, Sechrist, & Pender, 1988). With regard to the mean scores obtained at eight-weeks follow-up, comparable results were reported for a group of cardiac catheterization patients who had attended an educational class (Plach, Wierenga, & Heidrich, 1996).

One of the research questions for this study was to investigate changes in the health-promoting behaviours of patients from the time of angioplasty to approximately eight weeks post-procedure. The findings demonstrated a significant increase in total instrument and subscale scores. This indicated that angioplasty patients made improvements in the areas of nutrition, physical activity (PA), health responsibility (HR), stress management (SM), interpersonal relations (IPR), and spiritual growth (SG). Pender et al. (1990) also reported significant score changes for overall health-promoting lifestyle behaviours, HR, nutrition and SM in a sample of 589 employees prior to and three months after enrolling in health-promotion programs. However, no significant differences were detected for SG or IPR, and PA scores actually decreased significantly over this time period (Pender et al., 1990).

The greatest change in mean subscale scores was for nutrition and PA, respectively. Item content for these subscales address important lifestyle

modifications for CAD such as decreasing fat and cholesterol intake and engaging in regular exercise. The HR and SM subscales were next in order of mean score changes. Item content for the HR subscale did not reflect direct lifestyle modifications for CAD but did include activities that could potentially impact risk factor modification such as consulting with health care professionals and seeking information on how to improve health status. With regard to the SM subscale, lifestyle modification in relation to stress is important for people with CAD. The subscales with the lowest mean score changes, IPR and SG, did not include direct questions about risk factor modification for CAD.

The increase in health-promoting behaviours found in this study is consistent with other studies involving angioplasty patients (Gulanick & Naito, 1994; Jensen et al., 1993; McKenna, 1995) and other cardiac patients (Kison, 1992; Miller et al., 1985; Miller et al., 1990). This study does not support the findings of Gaw (1992) who found that none of the fourteen subjects in a qualitative study followed through with lifestyle changes two to three weeks after angioplasty.

Behaviour-Specific Cognitions and Affect

There were no significant relationships identified between the total HPLP score and social support at angioplasty or follow-up. Thus, study findings failed to support a major tenet of the HPM. That is, social support did not directly

impact overall health-promoting lifestyle behaviours. The absence of a direct relationship between social support and health-promoting behaviours has been previously documented in studies of health-promoting behaviours in post-MI males (Hilbert, 1985) and cardiovascular health behaviours in the general population (Franks et al., 1992). Conversely, social support was found to be positively correlated with improved cardiovascular risk status in cardiac patients (O'Reilly & Thomas, 1989), healthy behaviours in senior and young adults (Hubbard et al., 1984) and hospital employees in a health promotion program (Zimmermann & Connor, 1989), and health practices in well adults (Muhlenkamp & Sayles, 1986).

There are several reasons which may explain the lack of significant relationships between social support and health-promoting behaviours in angioplasty patients. First, the NSSQ was only administered at the time of angioplasty and not at follow-up. Social support may well have changed over that time period. At the time of angioplasty, patients listed hospital clergy and staff as support persons. It is possible that these supports were no longer available to patients after discharge. It is also possible that support persons available at the time of angioplasty were not as visible or accessible following discharge from the hospital. The significant correlations observed between the NSSQ subscales and IPR subscale scores at the time of angioplasty, but not at follow-up, would support this assumption.

Second, the NSSQ measured perceived support which may have differed from the support actually available to study participants. For instance several participants listed children who were living out of the province as being able to help "a great deal" if physical assistance was needed. The variant effects of perceived and actual support are documented in the literature (Krishnasamy, 1996; Stewart 1995).

Third, self-reporting may have inflated social support scores. That is, participants may have found it difficult to acknowledge that support persons, especially family members, were not available to help or did not maintain frequent contact.

Fourth, the NSSQ only measures positive aspects of social support and does not account for the responsibilities and stressors associated with being in a social network (Tilden & Galyen, 1987). According to the HPM immediate competing demands have a direct influence on health-promoting behaviour. It is conceivable that the responsibilities of being the principal homemaker or breadwinner in a family interferes with such lifestyle modifications as exercise, diet modification, and stress management.

Finally, the high intercorrelations within and between structural and functional support scores suggest that the instrument may be measuring only one aspect of social support. Also, the NSSQ does not attempt to measure informational support. In order for network members to support lifestyle

modification, they need information on CAD risk factors and how they can be reduced. There was no attempt in this study to determine knowledge levels of patients or their supports, but knowledge deficits may have reduced the effect of social supports on health-promoting behaviours. The importance of using an instrument that captures the multidimensional nature of social support is documented in the literature (Franks et al., 1992; Hubbard et al., 1984; O'Reilly & Thomas, 1989).

Individual Characteristics and Experiences

Prior related behaviour, perceived health status, demographics and illness-related variables were examined for their effects on health-promoting behaviours. Consideration was also given to the interactive effects of independent variables comprising this component of the HPM.

Interactive Effects

Health perception, or perceived health status, increased significantly from the time of angioplasty to follow-up but continued to remain below "good" for the majority of subjects. Two previous studies document an improvement in health perception of angioplasty patients from the time of the procedure to follow-up at six to twelve months (Bliley & Ferrans, 1993; Vogt et al., 1994). The health perceptions of angioplasty patients were higher than those reported for

ambulatory cancer patients (Frank-Stromborg et al., 1990), but lower than those reported for other groups: the elderly (Speake et al., 1989), and adults with disabilities (Stuifbergen & Becker, 1994). In the current study, 40% of participants reported experiencing chest pain at follow-up and this was significantly related to health perception as was the presence of co-existing illnesses. This may have contributed to a lower health perception for this group.

Health perception at the time of angioplasty was significantly correlated with health perception at the time of follow-up but only accounted for 28.1% of the variance, indicating there were other factors influencing this variable. Higher income and education levels were associated with better health perception. Support for these relationships in the general population is found in the literature (Manga, 1993; Reuter, 1995).

Predictors of Behavioral Outcome

The total HPLP score and individual subscales scores at the time of angioplasty were significantly correlated with the total HPLP score at follow-up. This finding supports the HPM assumption that prior related behaviour has a direct influence on behaviour outcome. During regression analysis only the HR subscale score emerged as a significant predictor of the HPLP score at follow-up (i.e., 32% explained variance).

With a large proportion of the variance in overall health promoting

behaviours unexplained by prior behaviour, other factors must be considered with this population. Health perception demonstrated significant positive correlations with the total HPLP score as well as the PA and SG subscales. When entered into multiple regression analysis, health perception accounted for 4.2% of the variance in overall health-promoting behaviours. This finding is comparable to other study findings where health perception accounted for a small but significant proportion of the variance for health-promoting behaviours in various populations (Frank-Stromberg et al., 1990; Gillis, 1994; Pender et al., 1990; Speake et al., 1989; Stuifbergen & Becker, 1994; Weitzel, 1989).

According to the HPM these findings suggest that more positive health perceptions result in a greater tendency to engage in health promoting behaviours. However, the reverse could also be true. That is, because a person may feel better from engaging in health behaviours, this could result in more positive health perceptions. The HPM does not account for the possibility of a bidirectional relationship between these two variables. The direct positive relationship found between health perception and health-promoting behaviours is also counter to the notion that angioplasty may negatively impact lifestyle modification (Gaw, 1992; Hanson, 1988; Jenkins & Kotra-Ottoboni, 1991). The reduction in symptoms and resulting improvement in health perception did not appear to give patients in this study the illusion of being cured and no longer in need of risk factor modification. In fact, the procedure could have provided the

stimulus to modify health-promoting behaviours.

The HPM proposes an indirect relationship between health perception and health-promoting behaviours through social support. Health perception depicted small but significant correlations with only two social support variables (aid and duration of relationship) at time of angioplasty, and only duration of relationships at follow-up. The indirect influence of health perception on health-promoting behaviours through social support was not well supported by this study's findings.

There were few significant correlations between demographics and health-promoting behaviours in this study. The positive correlations observed between age and total HPLP and three subscale scores (SG, IPR, SM) at the time of angioplasty concur with the findings of Franks et al. (1992) on the use of healthy behaviours in the general population. In contrast, studies of CAD patients failed to document a significant relationship between age and health-promoting behaviours (Hilbert, 1985; O'Reilly & Thomas, 1989). In the current study, at follow-up age only maintained a significant correlation with the IPR subscale score. It could be that the positive correlations observed at the time of angioplasty were an artifact of older subjects incorporating health-promoting behaviours into their lifestyles because of living with the diagnosis of CAD for a longer period of time. Further, newly diagnosed younger patients conceivably could have improved their health-promoting behaviours to a greater degree.

Gender influenced health-promoting behaviours indirectly through the social support variables. Men in this sample with greater social supports made significant improvements in their nutrition habits yet took significantly less responsibility for their own health. It was apparent from the data, as well as conversations with subjects, that wives were able to influence dietary modifications by taking responsibility for grocery shopping and meal preparation. The indirect relationship observed between gender and health-promoting behaviours supports the proposed relationships depicted in the HPM. This finding conflicts with previous studies which documented a direct relationship between health-promoting behaviours and gender (Rice et al., 1994; Rost et al., 1990; Stuifbergen & Becker, 1994; Weitzel et al., 1989).

Although previous studies have demonstrated significant relationships between health-promoting behaviours and education (Duffy et al., 1988; Kison, 1992; Riffle et al., 1989; Rost et al., 1990; Weitzel, 1989), occupation (Rost et al., 1990) and income (Rice et al., 1994), the current study failed to find support for these relationships. This could be a function of inadequate numbers in the subgroupings for these variables in this study. Thus, a more representative sample could potentially produce different findings.

Implications of Findings for the HPM

Data from the current study did not completely support the major premises

of the HPM. This could be due, in part, to the variables selected for measurement in this study. It is evident from the findings that other factors influence health-promoting activities.

About one quarter of the sample had just been diagnosed with CAD. Motivation, included in the HPM as a personal factor, was found to be a key variable in facilitating health-promoting behaviour in cardiac patients (McSweeney, 1993). Although the new diagnosis may have been the stimulus needed to make major lifestyle changes to reduce CAD risk factors for 25% of the sample, tests of difference did not show any significant differences in the total HPLP score based on length of time since diagnosis.

Another reason for the significant increase in scores may have been that angioplasty, which included hospitalization and exposure to information regarding CAD risk factors, acted as a stimulus for all patients to improve their lifestyles. Patients who had been diagnosed with CAD prior to this admission may not have made lifestyle modification, or may have done so initially but lapsed prior to this admission. The HPM identifies situational influences as having a direct impact on health-promoting behaviours. Angioplasty may have been the cue to action that patients needed to improve their risk factor status.

With regard to physical activity some patients may not have been able to exercise due to recurring chest pain and shortness of breath. The HPM does account for the direct and indirect effects of biological factors on behavioral

outcome. These patients may have avoided exercise prior to angioplasty for fear of precipitating an angina attack. This may account for the significant increase in this particular subscale score from angioplasty to follow-up.

Education has been significantly correlated with risk factor reduction (Gortner & Jenkins, 1990; Hoff & Lowenstein, 1994; Marshall et al., 1986; Mullen et al., 1992). Although the quality and quantity of educational programs were not assessed, improvement in health-promoting behaviours may have been partly due to increased knowledge levels. According to the HPM, perceived benefits of health-promoting behaviour directly influences the likelihood of engaging in such behaviour. Educational programs for CAD patients should include this information.

The failure to validate certain HPM relationships may have been partially due to the instruments used to measure behaviourial outcome. Walker et al. (1987) recommended that the HPLP be tested in various populations with different levels of health. Patients who have undergone angioplasty represent one such population. Reliability and validity testing in this study were favourable for the HPLP. However, this instrument does not measure smoking status or medication compliance. Smoking is a major risk factor for CAD. Medication compliance is a means of reducing the impact of hypertension and diabetes on CAD. High scores on the HPLP may not actually indicate a high level of health-promoting behaviour for angioplasty patients if they continue to smoke and are

noncompliant with medications.

Stuifbergen and Becker (1994) stated that the appropriateness of instruments for certain populations must be taken into account. One question under the nutrition subscale asked how often subjects consumed two to three daily servings from the meat, fish, poultry, beans, eggs, and nuts group. Subjects in this study tended to answer "never" probably because of attempts to reduce cholesterol. This resulted in a lower score for the nutrition subscale when this behaviour was actually an attempt at risk factor modification.

Riffle et al. (1989) found that some of the items on the HPLP were not appropriate for older subjects. Two items, which scored low in the current study, were exercising vigorously and reaching a target heart rate when exercising. These items may not be relevant for angioplasty patients who were not attending a cardiac rehabilitation program and who may have recently incorporated exercise into their lifestyle.

The HPLP was designed to measure subjects' perceptions of their health-promoting behaviours. There were no objective methods used in this study, such as cholesterol levels or body mass index, to validate responses. Therefore, the problem of self-reporting must be considered. This method of data collection has been criticized with regard to validity and accuracy (Polit & Hungler, 1995). Responses to the HPLP at follow-up may have been based on participants' perceptions of researcher expectations. They may have given responses

indicating a higher level of risk factor modification than actually achieved. Thus, the observed improvement in HPLP scores may have been inflated. This would have influenced study findings in relation to the HPM.

Summary

The purpose of this study was to explore the relationships between health perception, social support, demographics and illness-related variables, and health-promoting behaviours. A second purpose was to assess changes in health perception and health-promoting behaviours from the time of angioplasty to approximately eight weeks following the procedure. There was only limited support for the HPM which served as the conceptual framework for this study. The findings indicate that health perception and health-promoting behaviours increased significantly over time. Health perception and prior health-promoting behaviours depicted a small but significant relationship with the outcome variable. Social support was not directly related to overall health-promoting behaviours for the total sample in this study. When male subjects were examined separately, relationships were observed between social support variables and positive nutritional practices and low levels of health responsibility. Age was related to health-promoting behaviours at the time of angioplasty but not at follow-up.

CHAPTER 6

Limitations and Implications

In this chapter, the limitations of the study will be discussed. Implications for nursing practice, education, and research will also be presented.

Limitations

The small, convenience sample used in this study limits the generalizability of the findings and results should be interpreted with caution. Self-reporting and the repeated measurement of health behaviours using the same instrument may have contributed to inflated reports of health-promoting behaviour. The short time (M = 8 weeks) from angioplasty to follow-up may not have given an accurate picture of adherence to health-promoting behaviours over time.

Another limitation was the measurement of social support only at the time of the initial interview. Repeat measurement of social support at follow-up may have given a more accurate picture of subjects' support at that time. This may have provided different results for the relationship between social support and health-promoting behaviours after angioplasty. Although the NSSQ had good reliability and validity findings reported in the literature, the high subscale intercorrelations found in this study indicated that only one dimension of social support was measured.

Another limitation was the gender distribution in the sample. The relatively small number of females did not allow for thorough investigation of possible gender differences on key study variables.

Implications

Study findings have important implications for nursing practice, nursing education and nursing research. Each of these components will be addressed separately in the discussion that follows.

Nursing Practice

Implications for nursing practice will be discussed in terms of sample characteristics, changes in health-promoting behaviours over time, and the observed relationships between health-promoting behaviours and social support and health perception. The accessible population at the time of the study was mostly comprised of older, male patients with less than high school education. Although a convenience sample, all subjects were recruited from the only site where angioplasty is performed in this province. Given the fact that only one patient refused to participate, the final study sample is probably representive of the target population undergoing angioplasty locally.

Health-promoting behaviours did increase significantly from the time of angioplasty to follow-up. However, there was still room for improvement,

especially in nutrition and physical activity, two areas important for CAD risk factor reduction. Greater efforts should be directed towards developing nursing interventions that will help patients make the necessary lifestyle modifications in relation to CAD risk factors. Because of the short hospitalization period for angioplasty and budget cuts, more innovative interventions must be developed and implemented. Traditional approaches, such as the provision of written materials on risk factor reduction as patients are being discharged, are not working. Education must begin upon admission, continue throughout hospitalization, and after discharge into the community. There is a need for organized nursing follow-up and available resources for lifestyle modification once patients return home. Further, given the lower education levels of study subjects, nurses must consider this important extraneous factor when developing interventions to assist this group with lifestyle modifications. Patient teaching methods should be developed which are suitable and realistic for this population.

Previous related behaviour has been shown to play a role in health-promoting behaviours. An assessment upon admission of patients' health-promoting behaviours may provide direction for the type and intensity of nursing interventions directed at risk factor modification. Further, health responsibility also influenced overall health-promoting behaviours. In addition to providing information on risk factor modification, nurses may enhance health-promoting behaviours with interventions directed at increasing the patient's sense of

responsibility for health.

There were no significant differences based on the length of time since diagnosis for total HPLP scores at follow-up or the subscales dealing with risk factors for CAD such as nutrition, physical activity, and stress. This would indicate that patients can change behaviour at any point in time and nursing interventions aimed at risk factor reduction should be implemented regardless of any previous attempts at lifestyle modification. Indeed, interventions aimed at lifestyle modification need not wait until hospitalization. Risk factor modification should begin with primary prevention and for those with CAD, it should be implemented immediately upon diagnosis, not delayed until after treatment. Nurses strategically working in clinics, emergency rooms, outpatient clinics, and other community settings could make a major impact in this area.

The lack of significant findings for relationships between social support and health-promoting behaviours in this study was probably a result of the instrument used to measure this concept and the time at which it was administered. Patients in this study have large support networks consisting mostly of family members. The literature does not support abandoning this valuable resource as a means of promoting health behaviours for patients with CAD. In order for support persons to effectively influence behaviour change, they must be included in patient teaching early in the process.

An interesting study finding was the minimal identification of nurses as

part of support systems. Either nurses are not available to patients or they are not perceived as being accessible. If nurses want to play an important role in health promotion, especially in the community, they will have to make themselves more visible as a valuable resource for people attempting lifestyle modifications.

The relationship between health perception and health-promoting behaviours also has implications for nursing practice. If more positive perceptions of health status are correlated with an increased likelihood of engaging in health-promoting behaviours, nurses should reinforce positive health perceptions. Interventions which enhance feelings of well-being in the presence of a chronic illness should be implemented.

Nursing Education

In order to assist patients with CAD with lifestyle modification, nurses must have a thorough understanding of the role risk factors play in the development of this disease and how modification of the risk factors can change its progression. Because of the ongoing research in this area, nurses should remain current with this subject through their own study and continuing education programs.

Knowledge of risk factors however, is not sufficient for influencing behaviour change. There are many factors which influence the adoption and

maintenance of new behaviours such as the lifestyle modifications for CAD. Nurses must know and understand these factors in order to develop successful interventions. This information should be incorporated into nursing education programs and available to practicing nurses through continuing education.

The use of conceptual frameworks from which to view the complex process of health-promoting behaviours is beneficial and should be included in nursing curricula. While no model has been put forth which explains health-promoting behaviours completely in all situations, the use of a framework gives a broader understanding of the process and can guide nursing practice.

There is much to be understood in relation to health-promoting behaviours in people with CAD. This area of study should continue to be incorporated throughout nursing programs both at the undergraduate and graduate levels.

Nursing Research

There are many implications for nursing research which surface from this study's findings. These can be grouped into implications related to health-promoting behaviours, social support, and the Health Promotion Model.

The small proportion of the variance for health-promoting behaviours explained in this study and reported in the research literature supports the complexity of this concept and the number of influencing factors. More research is needed to better understand the factors that affect health-promoting

behaviours in people with CAD. The majority of research studies in this area are descriptive correlational and, while helpful, are limited in their contribution to nursing knowledge. Intervention studies, longitudinal in design, with objective measures of CAD risk reduction, would enhance nurses understanding of health-promoting behaviours in this population. Because of the complexity of this concept, more qualitative research studies are also needed to develop a greater understanding of the concept's parameters and the key factors influencing it.

Of the many factors which have been identified to influence health-promoting behaviours of people with CAD, it is still not clear how demographics impact behavioral outcome. One population group which has been largely neglected in the past and should be the subject for future research is females. Evidence-based practice may not be appropriate for this population if it is based on research involving mostly male subjects.

Study findings only partially supported the Health Promotion Model. Although this does not detract from the model's usefulness, more research is needed to test this model in different populations, especially the chronically ill. It is possible that models developed to explain health behaviours in the well population are not adequate to explain the process in people with chronic illnesses such as CAD. Further research is needed to test the appropriateness of this model for CAD patients.

Valid and reliable tools are needed to measure health-promoting

behaviours, social support, and health perceptions in the CAD population. It could be that existing tools should be revised or new ones developed to more accurately reflect perceptions of these factors in this population. Further psychometric testing of existing instruments, and the use of qualitative methodologies to identify relevant content domains is needed for this population.

Summary

The results of this study suggest that health-promoting behaviours increase following angioplasty and are influenced by health perception and prior health behaviours. Social support and demographics were not significant predictors of overall health-promoting behaviours in this study. Although the findings cannot be generalized, they generate knowledge which can be incorporated into nursing practice, education, and research.

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Appendix A

Consent Form

School of Nursing, Memorial University of Newfoundland
St. John's, Newfoundland
CONSENT TO PARTICIPATE IN NURSING RESEARCH

TITLE: Perceptions of Social Support, Health and Health-Promoting Behaviours in Angioplasty Patients

INVESTIGATOR: Patricia Grainger, 745-3920

You have been asked to participate in a research study. Participation in this study is entirely voluntary. You may decide not to participate or may withdraw from the study at any time without affecting your normal treatment.

Confidentiality of information concerning participants will be maintained by the investigator. The investigator will be available during the study at all times should you have any problems or questions about the study.

Purpose of the Study: You are being asked to participate in a research study of patients who are being treated with angioplasty for their illness. The purpose of this study is to explore possible relations among social support systems, health perceptions and healthy behaviours. The information that you provide may help nurses plan more appropriate care for patients following an angioplasty procedure.

Description of Procedures and Tests: You are being asked to participate in two interviews. The first interview will take place within twenty-four hours of your angioplasty procedure. The investigator will ask you a series of questions on social supports, health perceptions and health promoting behaviours. The social support questions will ask you to identify members of your social network and comment on your relationships with each of these people. The health promoting behaviour questions will ask you to rate various aspects of your health related behaviours. You will also be asked to rate your overall health. At approximately six weeks following your discharge from the hospital, you will be contacted via telephone for a second interview. At this time the investigator will again ask you to rate your overall health, and inquire further about health related behaviours.

Duration of Participation: The in-hospital interview will take approximately 30 minutes. The second interview, the telephone call at six weeks, will take approximately ten minutes.

Foreseeable Risks, Discomforts or Inconveniences: There are no expected risks from participating in this study. You may refuse to answer any questions which make you feel uncomfortable, and ask to terminate the interview at any time. All information that you provide will be kept strictly confidential, and located in a locked file accessible only to the investigator.

Benefits Which May be Received: You may not derive any direct benefits from participating in this study. However, the information that you provide may help nurses provide better care to others following angioplasty.

Liability Statement: Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities.

Any Other Relevant Information: Findings of this study will be available to you and health care professionals upon request. Findings may be published but you will not be identified. The investigator will be available during the study at all times should you have any problems or questions about the study.

I,_____, the undersigned, agree to my

participation in the research study described.

Any questions have been answered and I understand what is involved in the study. I realise that participation is voluntary and that there is no guarantee that I will benefit from my involvement. I acknowledge that a copy of this form has been given to me.

_____ _____

Signature of Participant Date

_____ _____

Signature of Witness Date

To be signed by investigator:

To the best of my ability, I have fully explained the nature of this study to the participant. I have invited questions and provided answers. I believe that the participant fully understands the implications and voluntary nature of the study.

_____ _____ _____

Signature of Investigator Date Phone Number

Appendix B

NSSQ and Letter of Permission

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRU

OFFICE OF THE DEAN
SCHOOL OF NURSING
SAN FRANCISCO, CALIFORNIA 94143-0604

TEL 1 (415) 476-4544
FAX 1 (415) 476-0707

Dear Colleague:

Enclosed is the copy of the Norbeck Social Support Questionnaire (NSSQ) and the 1995 Scoring Instructions that you requested. This instrument and scoring instructions were revised in late 1995 to conform to Window's version of SPSS for data entry and analysis. Note that neither the content nor scoring of the original NSSQ has been changed. Previous versions required some scoring corrections that are no longer necessary with this revised version.

Thank you for your interest in the NSSQ.

Sincerely,

Jane S Norbeck

Jane S. Norbeck, RN, DNSc, FAAN
Professor and Dean

enclosures

SOCIAL SUPPORT QUESTIONNAIRE

PLEASE READ ALL DIRECTIONS ON THIS PAGE BEFORE STARTING

Please list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important to you.

Use only first names or initials, and then indicate the relationship, as in the following example:

Example:

	First Name or Initials	Relationship
1.	MARY T.	FRIEND
2.	BOB	BROTHER
3.	M.T.	MOTHER
4.	SAM	FRIEND
5.	MRS. R.	NEIGHBOR

etc.

Use the following list to help you think of the people important to you, and list as many people as apply in your case.

- spouse or partner
- family members or relatives
- friends
- work or school associates
- neighbors
- health care providers
- counselor or therapist
- minister/priest/rabbi
- other

You do not have to use all 24 spaces. Use as many spaces as you have important persons in your life.

WHEN YOU HAVE FINISHED YOUR LIST, PLEASE TURN TO PAGE 2.

Note: Before use, pages 1-4 should be cut along the dashed center line to allow the response lines for Questions 1-6 to align with the Personal Network list on page 5.

For each person you listed, please answer the following questions by writing in the number that applies.

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 1:

How much does this person make you feel liked or loved?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

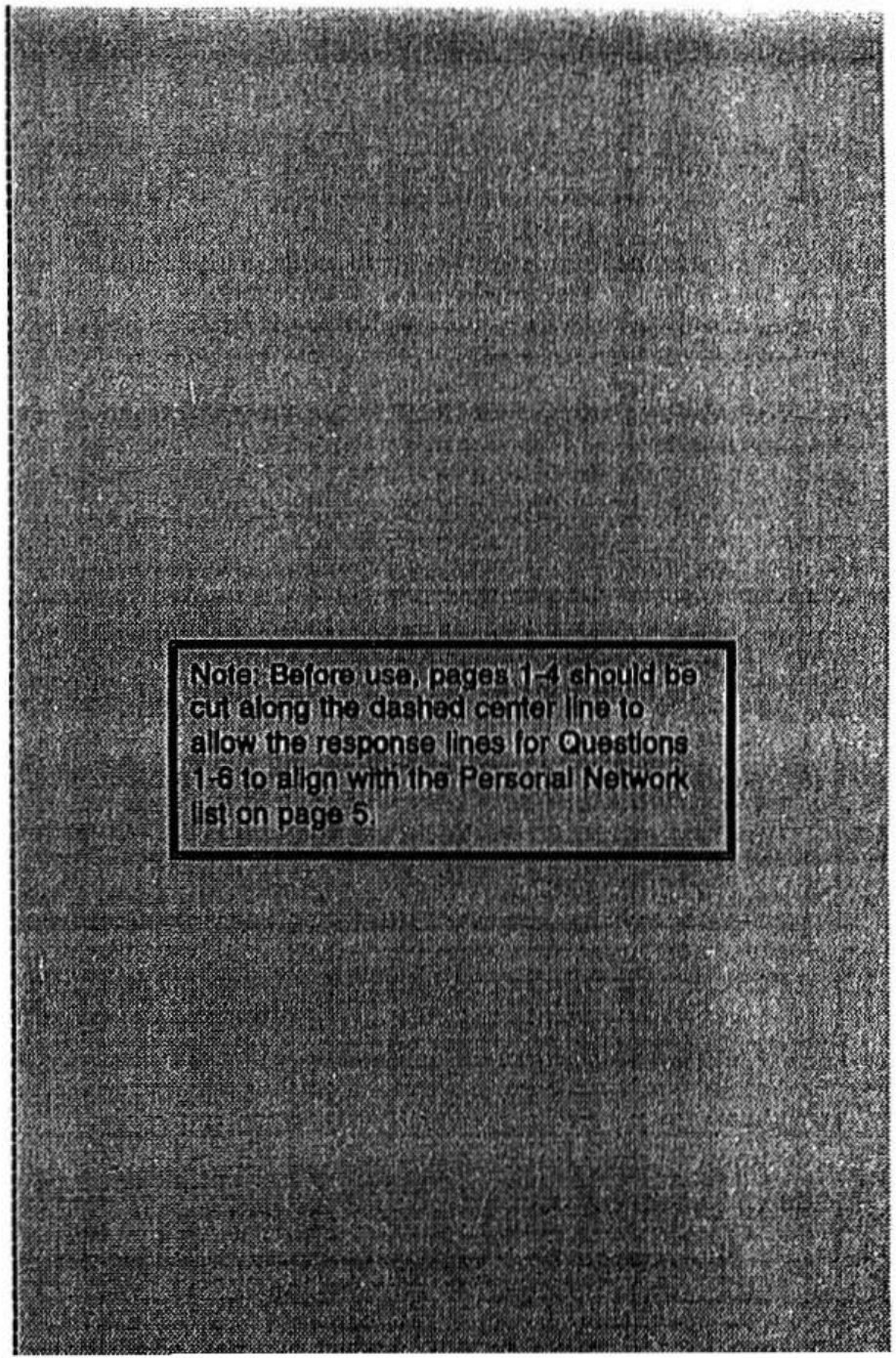
[EMO1]

Question 2:

How much does this person make you feel respected or admired?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[EMO2]



0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 3:

How much can you confide in this person?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[EMO3]

Question 4:

How much does this person agree with or support your actions or thoughts?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[EMO4]

Note: Before use, pages 1-4 should be cut along the dashed center line to allow the response lines for Questions 1-6 to align with the Personal Network list on page 5.

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 5:

If you needed to borrow $10, a ride to the doctor, or some other immediate help, how much could this person usually help?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

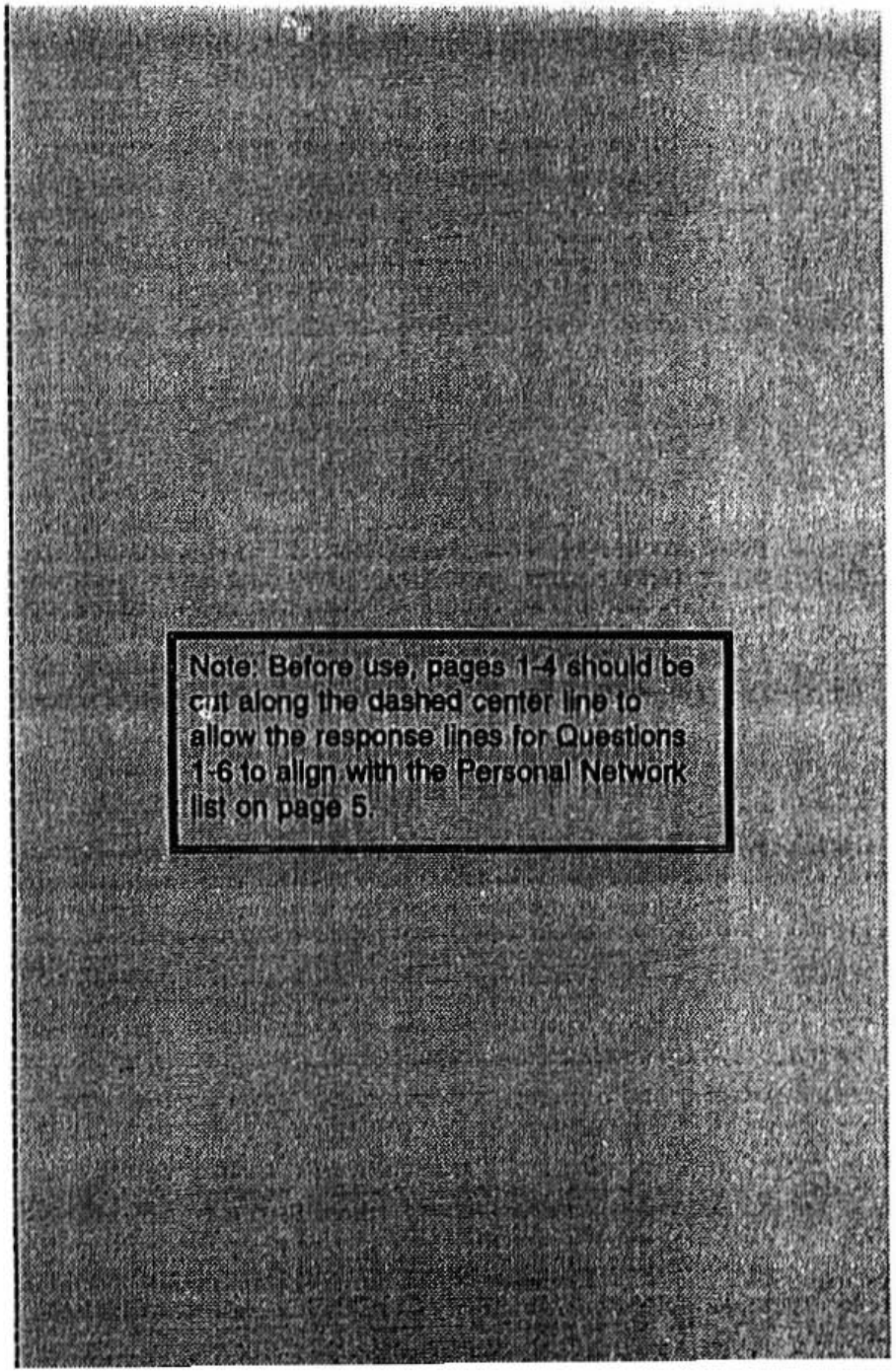
[AID5]

Question 6:

If you were confined to bed for several weeks, how much could this person help you?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[AID6]



Number _____ [IDNO]

Date _____

PERSONAL NETWORK

	First Name or Initials	Relationship
1.	_____	_____ [SOU1]
2.	_____	_____ [SOU2]
3.	_____	_____ [SOU3]
4.	_____	_____ [SOU4]
5.	_____	_____ [SOU5]
6.	_____	_____ [SOU6]
7.	_____	_____ [SOU7]
8.	_____	_____ [SOU8]
9.	_____	_____ [SOU9]
10.	_____	_____ [SOU10]
11.	_____	_____ [SOU11]
12.	_____	_____ [SOU12]
13.	_____	_____ [SOU13]
14.	_____	_____ [SOU14]
15.	_____	_____ [SOU15]
16.	_____	_____ [SOU16]
17.	_____	_____ [SOU17]
18.	_____	_____ [SOU18]
19.	_____	_____ [SOU19]
20.	_____	_____ [SOU20]
21.	_____	_____ [SOU21]
22.	_____	_____ [SOU22]
23.	_____	_____ [SOU23]
24.	_____	_____ [SOU24]

Question 7:

How long have you known this person?

1 = less than 6 months
2 = 6 to 12 months
3 = 1 to 2 years
4 = 2 to 5 years
5 = more than 5 years

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[DURATION]

Question 8:

How frequently do you usually have contact with this person? (Phone calls, visits, or letters)

5 = daily
4 = weekly
3 = monthly
2 = a few times a year
1 = once a year or less

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

[FREQCON]

PLEASE BE SURE YOU HAVE RATED EACH PERSON ON

9. During the past year, have you lost any important relationships due to moving, a job change, divorce or separation, death, or some other reason?

_____ 0. No
_____ 1. Yes [LOSS]

IF YES:

9a. Please indicate the number of persons from each category who are *no longer available* to you.

_____spouse or partner [LOSS1]
_____family members or relatives [LOSS2]
_____friends [LOSS3]
_____work or school associates [LOSS4]
_____neighbors [LOSS5]
_____health care providers [LOSS6]
_____counselor or therapist [LOSS7]
_____minister/priest/rabbi [LOSS8]
_____other (specify) _____ [LOSS9]

[LOSSNO]

9b. Overall, how much of your support was provided by these people who are no longer available to you? [LOSSAMT]

_____ 0. none at all
_____ 1. a little
_____ 2. a moderate amount
_____ 3. quite a bit
_____ 4. a great deal

Appendix C

Demographic and Medical Profile

Demographic and Medical Profile

Date_____ Subject Number_____

Age_____

Sex_____

Current Marital Status_____

Occupation at present or before retirement_____

Education Level

- Seventh grade or less _____
- Some high school _____
- High school graduate _____
- Some post-secondary _____
- College or university graduate _____
- Graduate degree _____

Approximate family income

- Less than 20,000 _____
- 20,000-40,000 _____
- 40,000-60,000 _____
- Above 60,000 _____

History of following illnesses:

Hypertension _____

Mental illness _____

Diabetes _____

Cancer _____

Alcohol or drug use _____

Lung disease _____

Kidney disease _____

Liver disease _____

Other _____

Cardiac History

When diagnosed_____

Coronary Angiogram results_____

Previous angioplasty_____

Previous CABG_____

Previous MI_____

Other_____

Medications

Cardiac_____

_____

Other_____

_____

Appendix D

HPLP and Letter of Permission

University of Nebraska Medical Center
Nebraska's Health Science Center

College of Nursing
Gerontological, Psychosocial, & Community Health Nursing
600 South 42nd Street
Box 985330
Omaha, NE 68198-5330
(402) 559-6382
Fax: (402) 559-6379

Dear Colleague:

Thank you for your request and payment to use the *Health-Promoting Lifestyle Profile II*. As indicated in the enclosed form, you have permission to copy and use the enclosed *Health-Promoting Lifestyle Profile II* for non-commercial data collection purposes such as research or evaluation projects provided that content is not altered in any way and the copyright/permission statement at the end is retained. The instrument may be reproduced in the appendix of a thesis, dissertation or research grant proposal without further permission. Reproduction for any other purpose, including the publication of study results, is prohibited without specific permission.

While not required as a condition of use, we would appreciate your providing us your HPLPII data along with a few demographic items on disk at the completion of your study. Such data would be used only to develop norms for various population groups and to evaluate psychometric characteristics of the scales across population groups. If the event that you are willing to provide such data, a cover sheet and instructions for format are enclosed.

We thank you for your interest in the *Health-Promoting Lifestyle Profile II* and wish you much success with your efforts.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor and Chair,
Department of Gerontological, Psychosocial and Community Health Nursing

Encl.: Health-Promoting Lifestyle Profile II
Scoring instructions
List of publications reporting use of the original Lifestyle Profile

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habit. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequ with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

		NEVER	SOMETIMES	OFTEN
1.	Discuss my problems and concerns with people close to me.	N	S	O
2.	Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O
3.	Report any unusual signs or symptoms to a physician or other health professional.	N	S	O
4.	Follow a planned exercise program.	N	S	O
5.	Get enough sleep.	N	S	O
6.	Feel I am growing and changing in positive ways.	N	S	O
7.	Praise other people easily for their achievements.	N	S	O
8.	Limit use of sugars and food containing sugar (sweets).	N	S	O
9.	Read or watch TV programs about improving health.	N	S	O
10.	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O
11.	Take some time for relaxation each day.	N	S	O
12.	Believe that my life has purpose.	N	S	O
13.	Maintain meaningful and fulfilling relationships with others.	N	S	O
14.	Eat 6-11 servings of bread, cereal, rice and pasta each day.	N	S	O
15.	Question health professionals in order to understand their instructions.	N	S	O
16.	Take part in light to moderate physical activity (such as sustained walking 30 :0 minutes 5 or more times a week).	N	S	O
17.	Accept those things in my life which I can not change.	N	S	O
18.	Look forward to the future.	N	S	O
19.	Spend time with close friends.	N	S	O
20.	Eat 2-4 servings of fruit each day.	N	S	O
21.	Get a second opinion when I question my health care provider's advice.	N	S	O
22.	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	N	S	O
23.	Concentrate on pleasant thoughts at bedtime.	N	S	O
24.	Feel content and at peace with myself.	N	S	O
25.	Find it easy to show concern, love and warmth to others.	N	S	O
26.	Eat 3-5 servings of vegetables each day.	N	S	O

	NEVER	SOMETIMES	OFTEN
27. Discuss my health concerns with health professionals.	N	S	O
28. Do stretching exercises at least 3 times per week.	N	S	O
29. Use specific methods to control my stress.	N	S	O
30. Work toward long-term goals in my life.	N	S	O
31. Touch and am touched by people I care about.	N	S	O
32. Eat 2-3 servings of milk, yogurt or cheese each day.	N	S	O
33. Inspect my body at least monthly for physical changes/danger signs.	N	S	O
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O
35. Balance time between work and play.	N	S	O
36. Find each day interesting and challenging.	N	S	O
37. Find ways to meet my needs for intimacy.	N	S	O
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O
39. Ask for information from health professionals about how to take good care of myself.	N	S	O
40. Check my pulse rate when exercising.	N	S	O
41. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O
42. Am aware of what is important to me in life.	N	S	O
43. Get support from a network of caring people.	N	S	O
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O
45. Attend educational programs on personal health care.	N	S	O
46. Reach my target heart rate when exercising.	N	S	O
47. Pace myself to prevent tiredness.	N	S	O
48. Feel connected with some force greater than myself.	N	S	O
49. Settle conflicts with others through discussion and compromise.	N	S	O
50. Eat breakfast.	N	S	O
51. Seek guidance or counseling when necessary.	N	S	O
52. Expose myself to new experiences and challenges.	N	S	O

Appendix E

Approval from Human Investigation Committee

Memorial
University of Newfoundland

Human Investigation Committee
Research and Graduate Studies
Faculty of Medicine
The Health Sciences Centre

20 March 1996

Reference #96.19

Ms. Patricia Grainger
48 Gander Crescent
St. John's, NF
A1E 5R6

Dear Ms. Grainger:

This will acknowledge receipt of your correspondence dated **March 13, 1996**, wherein you provide a revised consent form for the research application entitled **"Perceptions of Social Support, Health and Health-Promoting Behaviours in Angioplasty Patients"**.

I have examined the revised consent form and am recommending full approval of the application. I will have this decision ratified by the full Human Investigation Committee at a meeting scheduled for March 28, 1996.

We take this opportunity to wish you every success with your research study.

Sincerely yours,

H.B. Younghusband, Ph.D.
Chairman
Human Investigation Committee

cc Dr. K.M.W. Keough, Vice-President (Research)
Dr. Ford Bursey, General Hospital Representative, HIC
Dr. Eric Parsons, Medical Director, General Hospital
Dr. John Simpson, Chair, Human Investigation Committee, St. Clare's
Dr. S. Conroy, Medical Director, St. Clare's Hospital
Dr. Maureen Dunn, Chairperson, Ethics Committee, Grace Hospital
Ms. Denise Dunn, c/o Medical Director's Office, Grace Hospital

University of Newfoundland

Office of Research and Graduate Studies (Medicine)
Faculty of Medicine
The Health Sciences Centre

25 March 1996

TO: Ms. Patricia Grainger

FROM: Dr. Verna M. Skanes, Assistant Dean
Research & Graduate Studies (Medicine)

SUBJECT: Application to the Human Investigation Committee - #96.19

The Human Investigation Committee of the Faculty of Medicine has reviewed your proposal for the study entitled **"Perceptions of Social Support, Health and Health-Promoting Behaviours in Angioplasty Patients"**.

Full approval has been granted for one year, from point of view of ethics as defined in the terms of reference of this Faculty Committee.

It will be **your responsibility to seek necessary approval from the hospital(s) wherein the investigation will be conducted**.

Notwithstanding the approval of the HIC, the primary responsibility for the ethical conduct of the investigation remains with you.

Verna M. Skanes, Ph.D.
Assistant Dean

cc Dr. K.M.W. Keough, Vice-President (Research)
Dr. Ford Bursey, General Hospital Representative, HIC
Dr. Eric Parsons, Medical Director, General Hospital
Dr. John Simpson, Chair, Human Investigation Committee, St. Clare's
Dr. S. Conroy, Medical Director, St. Clare's Hospital
Dr. Maureen Dunn, Chairperson, Ethics Committee, Grace Hospital
Ms. Denise Dunn, c/o Medical Director's Office, Grace Hospital

St. John's, NF, Canada A1B 3V6 • Tel.: (709) 737-6762 • Fax: (709) 737-5033 • email: rgs@morgan.ucs.mun.ca

Appendix F

Approval from Health Care Corporation

HealthCare
Corporation of St. John's

May 15, 1996

TO: Patricia Grainger

FROM: Eric R. Parsons, MD,CCFP

SUBJECT: Research Proposal

Your research proposal - **HIC # 96.19 - "Perceptions of Social Support, Health-Promoting Behaviours In Angioplasty Patients"** has been considered by the Research Proposal Approval Committee RPAC) of the Health Care Corporation of St. John's at their most recent meeting.

The committee has approved your proposal to be conducted at the Grace/St. Clare's/General Hospital Sites within the Health Care Corporation of St. John's. This approval is contingent on the appropriate funding being provided and continued throughout the project and on the provision of regular progress reports as least annually to the RPAC Committee.

Eric R. Parsons, MD,CCFP
Vice-President, Medical Services

ERP\ek
cc: Linda Purchase, Research Centre
Site Administrator, Grace Hospital
St. Clare's Hospital
General Hospital

Appendix G

Approval from Divisional Chief

GH
THE GENERAL HOSPITAL

300 Prince Philip Drive
St. John's, Nfld. Canada A1B 3V6

Health Sciences Centre
Telephone: (709) 737-6300
Fax: (709) 737-6400
Office: (709) 737-

Dr. L. A. Miller Centre
Telephone: (709) 737-6
Fax: (709) 737-6969
Office: (709) 737-

February 6, 1996

Mrs. Patricia Grainger
48 Gander Crescent
St. John's, Newfoundland
A1E 5R6

RE: Nursing Research Study Entitled " Perceptions of Social Support, Health and Health-Promoting Behaviours in Angioplasty Patients".

Dear Mrs. Grainger:

I have read your research proposal and am pleased to support it.

The " Achilles Heel " of angioplasty is a relatively high restenosis rate and your proposed study has the potential to shed more light on some of the factors which affect the long term success or failure of angioplasty.

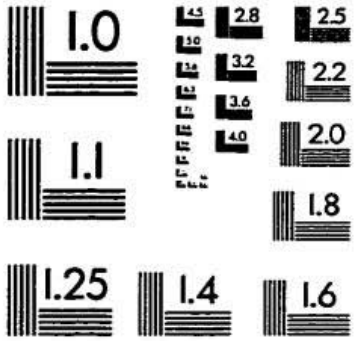
You have permission from this Division to include angioplasty patients in your study. I understand from your letter that you will be discussing your study individually with Drs. Furey, MacCallum, Rose, and Williams.

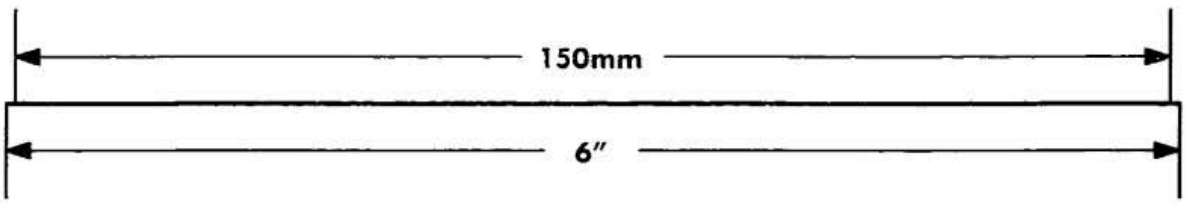
Yours sincerely,

Eric W. Stone, MD, FRCPC
Chief Division of Cardiology

EWS/mms

TEST TARGET (QA-3)





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Rochester, NY 14609 USA
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Fax: 716/288-5989