SOCIAL SUPPORT COMPARISONS BETWEEN MEN AND WOMEN IN PHASE II CARDIAC REHABILITATION

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(ABSTRACT)

Social support plays a key role in the rehabilitation of acute and chronically ill people. Generally, if one receives some type of social support then he or she is more likely to improve their physical, emotional, and/or psychological well-being during the rehabilitative phase. The type and amount of social support the cardiac patient perceives may affect participation in cardiac rehabilitation.

The purpose of this study was to 1) determine if there was a difference between the amount of social support perceived by men and women entering a phase II cardiac rehabilitation exercise program 2) to examine the relationship between social support and the first four weeks of rehabilitation compliance. A sample (n = 29) of twenty two men (63.1 y.o. ± 10.1) and seven women (70.4 y.o. ± 11.4) voluntarily completed the Medical Outcomes Study (MOS) Social Support Survey as they entered into the phase II programs. The sample population consisted of patients with one or more of the following characteristics: MI (76%), CABG (59%), PVD (21%), PTCA (28 %), diabetes (21 %), hypertension (48 %), and angina (41 %). Two sites were used in the study; one urban and

one rural. Each program session consisted of 60 minutes of exercise which consisted of flexibility, cardiovascular, and strength conditioning routines. All sessions were monitored by exercise specialists and registered nurses. Classes met three times per week on Monday, Wednesday, and Friday. As patients entered the programs, they were administered the MOS Survey which consists of 19 questions that address four types of social support -- *tangible, affection, positive interaction, and emotional.* Each patient's attendance was recorded from initial entry to the end of four weeks.

Data collection began in February 1995 and ended in May 1995. The results of the study demonstrated that there were no significant differences between men and women and their perception of social support at entry into the program. The mean total social support scores for men and women were 314.1 ± 85.2 and 307.1 ± 47.0 ($p = 0.84$), respectively out of a possible 400. There was no significant relationship between men and women and their compliance to the program ($\chi^2 = 3.15$, df = 2; $p = 0.21$). In addition, there was no significant relationship between low, medium, and high compliers and their overall social support scores ($p = 0.41$). Results from these analyses should be viewed with caution as sample sizes were small.

In conclusion, this study did not find that social support was associated with cardiac rehabilitation compliance. However, low entry rates into both programs and the extended length of the study resulted in very low sample sizes. Hence, the analyses may not have had sufficient statistical power to identify differences and make valid comparisons.

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CHAPTER 1

Introduction

Cardiovascular disease (CVD) kills more Americans than cancer, accidents, pneumonia, influenza and all other causes of disease combined. In 1989, it was estimated that 69 million people in America suffered from some type of CVD. Out of this number 497,850 people died from coronary heart disease (CHD; AHA, 1991). Historically, CHD has been thought to be primarily a problem for men. It was estimated in 1989 that 440,000 men age 65 and older suffered a heart attack while those men between the ages of 45-64 suffered 424,000 heart attacks (AHA, 1991). However, CVD also strongly effects the mortality of women over 65 years of age. In fact, myocardial infarction (MI) is the number one killer of American women. The actual number of MI's occurring in 1989 among women over the age of 65 were 374,000. Women made up approximately 48 percent of all heart attacks that occurred in the United States in 1989. For those women having a MI after age 65, they were twice as likely as men to die from the event within a few weeks (AHA, 1991).

Surgical Treatment for CAD

Two common surgical procedures performed to prevent or repair an MI or stroke are the percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass graft (CABG; AHA, 1991). Recovery from an MI, as well as these types of surgeries, often results in the physician's recommendation for the patient to engage in a medically supervised exercise program.

Cardiac Rehabilitation

Cardiac rehabilitation is the process by which people who have CHD undergo treatment to restore his or her physiological, psychological, social, vocational, and emotional condition back to normal (AACVPR, 1991). All CVD's are often associated with certain health-related risks factors such as hypertension, hypercholesterolemia, diabetes, obesity, cigarette smoking, and family history of heart disease occurring in parents or siblings prior to age 55 (ACSM, 1991).

There are four phases in cardiac rehabilitation. Phase I is usually initiated after the patient experiences an MI or undergoes CABG surgery. This phase helps slow down the deconditioning caused by bed rest. Phase II is prescribed to patients who have gone through phase I or those who are considered to be moderate to high risk patients. Levels of risks are categorized by the patient's medical history, graded exercise test (GXT), documentation of arrhythmia, left ventricular dysfunction, and any form of CVD. Phases III and IV are considered maintenance stages. Patients reaching this phase have regained most, if not all, of their physiological abilities to exercise (AACVPR, 1991).

Men and women are not differentiated when it comes to phases of cardiac rehabilitation. That is, rehabilitative services are provided for both sexes and all ages. Specific exercise prescriptions may be set up with each individual participating in cardiac rehabilitation, but general guidelines are always used for the treatment of both genders, i.e., warm-up, exercise, cool-down, stretching, counseling.

Engaging in cardiac rehabilitation has been shown to reduce cardiovascular mortality as much as 25% for those patients participating in phase II cardiac rehabilitation (Oldridge, 1988). That is why compliance to a phase II cardiac rehabilitation program (12 weeks) is so crucial for the patient. It is imperative for the patient to comply if he or she expects to gain the benefits associated with these exercise services (Andrew et al, 1981). This is not to say that individual benefits may only be gained through exercising. Cardiac rehabilitation services typically involve educational classes on risk factor modification, smoking cessation, weight loss/management, dietary modification/low fat cooking tips, and stress management. These educational classes may involve the spouse or significant other of the patient.

Adherence in Cardiac Rehabilitation

Compliance has been defined as the extent to which a person's behavior (in terms of taking medication, following diets, or executing life-style changes) coincides with medical or health advice (Haynes, 1979). In most studies involving phase II patients and exercise programs, "dropout" is usually defined as a patient who attends less than half the scheduled sessions (Cannistra, 1992; Conn, 1991). Certain patient characteristics such as blue collar worker, smoker, sedentary lifestyle, angina, overweight, older age, and low education status may predict patient dropout from a phase II-III exercise program (Oldridge, 1991; McGee, 1992). These characteristics are seen in both men and women who are considered non-compliers in cardiac rehabilitation programs. Other reasons patients give for not attending phase II, III programs are medical, job-related, program type, staff, inconvenience, logistics, financial, family problems, lack of goal-orientation, physician's recommendation, and lack of social and spousal support (Oldridge, 1979, 1984, 1985, 1990; Andrew, 1981; Cannistra, 1992; Ades, 1992; O'Callaghan, 1984; Daltroy, 1989; Bruce, 1976). Most of these reasons for dropping out are similar between men and women, however, the relative importance may differ between the two sexes.

Characteristics of Dropouts and Patients with Low Adherence

Several characteristics have been identified with the cardiac patient who has low attendance and/or drops out from the rehabilitation program. Some of the more common characteristics seen in the literature are smoker, blue collar worker, overweight, angina, and low socio-economic status (Bruce, 1976). These characteristics are found in men as well as in women.

In the population of cardiac patients who attend some phase of rehabilitation, women are more likely than men to have lower attendance and higher dropout rate from an exercise program (Conn, 1991; Schuster, 1991). The overall average compliance for male cardiac participants in rehabilitation is still problematic with adherence to exercise being recorded at 40% - 50% (Oldridge, 1991).

Men

Some of the more common reasons men give for dropping out of a phase II cardiac rehabilitation program are inconvenience, job related (Andrew, 1981), medical (Bruce, 1976; Cannistra, 1992), and lack of spousal support (Fleury, 1991; O'Callaghan, 1984; Oldridge, 1990; Daltroy, 1989). The lack of spousal support was reported in several studies addressing the issue of compliance in cardiac rehabilitation and the rate of dropout from the program. Some researchers believe that the male cardiac patient perceives the lack of spousal support and not overall social support because the male patient may associate social support with that experienced from co-workers during their return to the work-force (Conn, 1991). In the majority of literature on compliance to cardiac rehabilitation, the lack of spousal and or social support was reported as being part of the reason for the cardiac patient to drop out of the program. From this reported information on social support and compliance and the male cardiac patient, one may assume that the lack of social support could be an important factor underlying the cause for dropout from all phases of cardiac rehabilitation.

Women

Several reasons have been suggested why females attend cardiac rehabilitation less than males. In no order of relative importance, reasons for not attending cardiac rehabilitation for females are physician recommendation (Ades, 1992), less fit than males upon initial entry of exercise program (Godin, 1985), older age (McGee, 1992), experience more depression (Conn, 1991), and lack of social support (Godin, 1985; Oldridge, 1984, 1991; Andrew, 1981). Even though lack of social support is experienced in both the male and female patient, it has been demonstrated by Ward, (1993) and Acitelli and Antonucci, (1994) that females may experience less social support than their male counterpart.

A cohort effect may be another reason why older women (>65) are prone to dropping out of a rehabilitation program. Women born in the 1920's - 1930's may have been lectured on "acting like a lady" and not engaging in any form of exercise, especially those exercises that were masculine in nature. This belief may have been internalized and carried over into their elderly years, thus affecting compliance in phase II rehabilitation (Vertinsky & Auman, 1988).

Wenger, (1988) and Yates, (1987) reported women who had an MI were more likely to experience anxiety, depression, and sexual dysfunction than men. They also took longer in returning back to work than men. The delay in returning back to work for women is reflected by 40% more time spent in bed than men. This is due in part from a slow recovery rate associated with the MI (Schuster, 1991).

These reasons may indicate why more than 35% of cardiac patients dropout of rehabilitation in the first month than any other time during their duration in phase II (Bruce, 1976; Schuster, 1991). Out of this group, women are less likely to attend phase II cardiac rehabilitation than men. Females also have the tendency to attend less than males in rehabilitation phases III and IV (Oldridge, 1980; O'Callaghan, 1984; McGee, 1992).

Importance of Compliance

Most benefits of a phase II cardiac rehabilitation program may only be gained through consistent attendance to the exercise program. Both men and women who are candidates for phase II stand a greater and faster chance for recovery by complying to a phase II exercise program than those individuals who, for whatever reason, dropout early into the program (Oldridge, 1979). If social support affects the way a cardiac patient adheres to an exercise program, then the assessment of this important factor upon entry into the rehabilitation phases could very well predict the individual's chance of finishing the rehabilitation phase period with an overall efficient compliant record. The efficacy of any cardiac rehabilitation program depends on the consistency of the patient to comply to at least 50% of the scheduled exercise sessions (Oldridge, 1991).

Social Support

Social support may affect a person's desire to adhere to lifestyle modifications. Having support from family and friends has been shown to help individuals adhere to weight loss and smoking cessation programs (Miller, 1981; Coppotelli, 1985). It appears that social support may influence the cardiac patient to comply on a continuous basis to cardiac rehabilitation (Friis, 1986). Not only does social support effect the compliance of patients attending cardiac rehabilitation, it also seems to enhance the patient's ability to recuperate faster from their cardiac event (Fleury, 1993).

Statement of the Problem

Considering the significant impact of low compliance and high dropout rates on success in cardiac rehabilitation, it is possible that one dominant factor could be contributing to these adherence problems. It is possible that the lack of social support could be an underlying factor affecting the adherence problem in cardiac rehabilitation. Therefore, the purpose of this study is to assess the social support perceived by men and women during the first four weeks of phase II cardiac rehabilitation. In addition, social support scores will be compared against the attendance of each patient so that correlations may be assessed.

Research Hypotheses

1. There is no difference in the amount of social support perceived between men and women entering into a phase II cardiac rehabilitation program. 2. No relationship exist between men and women and their attendance levels in cardiac rehabilitation.
3. There is no difference between all low, medium, and high level compliers in the amount of perceived social support.

Significance of the Study

Several reasons have been suggested why females attend less than males, but few attempts have been made to establish consistent evidence reflecting these differences. Many studies point to social support as one of the primary factors influencing attendance to all phases of cardiac rehabilitation (Oldridge, 1984, 1991; Andrew, 1981; O'Callaghan, 1984; Fleury, 1991). In regards to the dropout rates among men and women attending cardiac rehabilitation, the highest percent of dropouts in phase II rehabilitation occur within the initial four weeks of exercise programs (Bruce, 1976; Oldridge, 1984; Daltroy, 1985).

Delimitations

a. The Medical Outcomes Study (MOS) Survey will be used to measure the amount of social support perceived by the phase II cardiac patients.

b. Approximately 20 males and 20 females at least 18 years of age will be used in the study.

c. Phase II cardiac patients diagnosed with the following cardiac events: MI, PTCA, CABG, CAD, PVD, and/or heart transplant will be used in the study.

d. All subjects will have graduated from phase I cardiac rehabilitation and/or cleared by referring physician.

e. Each subject's attendance will be recorded 4 weeks after their initial scheduled exercise session.

f. The collection of data from MOS Survey will end April 28, 1995 regardless of the number of subjects collected to complete the survey.

g. Each subject's response to each question on the MOS Survey will be considered truthful.

Limitations

a. Surveys will be issued to two hospital-based phase II exercise programs, one located in a metropolitan area, the other in a rural community.

b. The method for giving survey differed between the two programs.

c. Documented patient attendance will begin from the initial schedule exercise session through the end of twelve sessions.

Basic Assumptions

It is the assumption of the researcher that all subjects are capable of reading each question on the MOS Survey. The researcher also assumes that each subject will truthfully answer all questions dealing with social support. It is assumed that each and every MOS Survey will be administered by the undergraduates in the same, orderly fashion according to certain standards set forth by the primary researcher. The MOS Survey is a reliable and valid survey which measures four types of social support. The scores received by each subject are indicative of the amount of social support they perceive or are experiencing when they enter the phase II programs. The attendance of every participant will be recorded throughout their enrollment in the phase II programs.

Definitions of Terms and Symbols

Angina -- Severe cardiac pain caused by a decreased supply of blood to the heart's muscle which can be induced by exercise in susceptible individuals.

Arrhythmia -- An abnormal beat of the heart.

Cardiovascular Disease (CVD) -- Disease involving the heart and blood vessels.

Coronary Artery Bypass Graft (CABG) -- Arteries or veins are sutured above and below a blocked coronary artery to restore adequate blood flow to that portion of the myocardium.

Coronary Heart Disease (CHD) -- Atherosclerosis of the coronary (heart) arteries.

Diabetes -- A metabolic disorder characterized by an inability to oxidize carbohydrates because of inadequate insulin (Type I) or a resistance to insulin (Type II).

Family History of CHD -- The major health problems associated with the heart that have been found in a person's grandparents, parents, uncles, aunts, and siblings.

Graded Exercise Test (GXT) -- A multistage test that determines a person's physiological responses to different intensities of exercise and / or the person's peak aerobic capacity.

Hypercholesterolemia -- An excess of cholesterol in the blood; levels > 240 ml/dl.

Hypertension -- High blood pressure; systolic level ≥ 160, mmHg, diastolic level ≥ 90 mmHg.

Myocardial Infarction (MI) -- Death to a section of heart tissue in which the blood supply has been cut off.

Obesity -- The accumulation and storage of excess body fat; ≥ 20% above ideal range for age group.

Percutaneous transluminal coronary angioplasty (PTCA) -- A procedure in which a catheter is inserted in a blocked artery and a balloon is inflated to push the plaque back toward the wall to open the artery.

Peripheral Vascular Disease (PVD) -- Vascular disease associated with arteriosclerosis, hypertension, and hyperlipidemia which causes ischemic pain typically occurring in the lower leg (calf muscle) and hip area.

Social Support -- The psychosocial emotional, tangible and intangible aid provided by the social networks (family, friends, and others who provide support) and received by the person.

Summary

Even though the mortality rates have decreased over the past ten years, CVD still kills more Americans than any other diseases, accidents, and all other causes combined. An individual diagnosed with CVD may reduce their chances of early mortality by entering a cardiac rehabilitative program. Once the cardiac patient begins an exercise rehabilitative program, he or she should comply to most, if not all of the scheduled sessions. Since both men and women share inconsistent patterns of adherence to such programs, it is imperative that the staff of these cardiac rehabilitation services be aware of certain characteristics that signal early dropout from the program. Some of the more common patient characteristics that signal early dropout or low compliance to cardiac rehabilitation are blue-collar worker, overweight, experiencing angina, smoker, and low socio-economic status. From this list of characteristics women tend to drop out more than men. Women also attend less frequently to cardiac rehabilitation than their male counterpart. Reasons for both men and women not attending regularly to cardiac rehabilitation vary from job-related and logistical problems to medical problems and physician referral. From the many reasons that patients give for not attending consistently, social support seems to surface more times as the number one reason for their low compliance to the program.

Chapter 2
Literature Review

Patient compliance to cardiac rehabilitation programs continues to present problems to health care providers. The health-related benefits that may be obtained through cardiac rehabilitation cannot be achieved unless attendance is regular (Oldridge, 1991). Regular attendance for patients seems to be a problem seen throughout most cardiac rehabilitation programs particularly in the first month of most phase II rehabilitation programs where 35% of the patients drop out (Bruce, 1976; Schuster, 1991). This is especially true for the female participant who is less likely to comply than her male counterpart. Several characteristics predict an increased risk of dropping out of cardiac rehabilitation programs. Identifying these characteristics early on in the rehabilitative phase may assist the health professional in helping those who are more susceptible to dropping out of the program.

Certainly not all cardiac patients who attend cardiac rehabilitation irregularly possess all of the "dropout" characteristics. Some patients may be affected by only one factor the leads them to poor attendance to these rehabilitative programs. In the majority of the literature on compliance in cardiac rehabilitation, the same reasons given by both men and women appear frequently. However, the emphasis placed on each reason is weighted differently for the two sexes. In order to make conclusions on the underlying factor(s) that affect men and women's compliance to cardiac rehabilitation, one must investigate the probable causes, characteristics, and reasons that represent the cardiac rehabilitation population.

Life-style

Some of the more common factors associated with low compliance have been reported as smoker, blue collar worker, and sedentary during leisure time. (Oldridge, 1985, 1992; Bruce et al., 1976). In the study by Oldridge, (1992) women who smoked were more likely to drop out of the cardiac rehabilitation than were the men who smoked. The men that did smoke, however, had lower attendance than those who did not smoke. The AHA, (1992) reports that those Americans who smoke usually have less formal education than those who do not smoke. This more than likely reflects the blue collar worker who, in most cases, has received little education, smokes, and retains a low socio-economic status (Oldridge, 1979). Blue collar workers participating in cardiac rehabilitation often suggest that job-related reasons are why they drop out early into the program. This may suggest that their employer is not able to give them release time to attend cardiac rehabilitation. Most blue collar workers equate their job with exercise. They usually report feeling tired at the end of the workday, thus relating their fatigue with exercise. This may explain why they are often sedentary during their leisure time (Dishman, 1982). Most cardiac patients share, but are not limited to, these common factors.

Perception of Benefit

Oldridge and Spencer, (1985) found disinterest and low self-motivation as the major reasons for patient dropout in a 6 month supervised cardiac rehabilitation exercise program. The patient may be experiencing disinterest and low self-motivation because of his or her perception on the benefits of exercise. Some individuals believe that the risks of exercise after experiencing a cardiac event out weigh the benefits of exercise (Andrew et al., 1981). Oldridge, (1991) found just the opposite in the patient's belief in exercise. Those patients who attended the exercise sessions in rehabilitation believed the benefits out weighed the risks associated with exercise and coronary disease.

Personality

Oldridge, (1978) reported that Type A personality is a characteristic associated with the high risk of dropping out. Type A personalities usually carry with them a lot of hostility and anger. Becoming isolated from people generally prevails with these individuals. The extension of help from health care providers in cardiac rehabilitation is often rejected by these individuals. The advice that the health care provider offers on the benefits of regular attendance to the exercise program is usually disregarded. This may result in the Type A patient attending rehabilitation at a low compliance rate and eventually dropping out from the program (Matthews, 1982).

Medical Problems

Other factors associated with low attendance or dropout are obesity, angina, arthritis, alcoholism, ischemia, having a CABG, increases in resting systolic blood pressure by 10 mm Hg or greater, and the presence of sputum during exercise (Oldridge, 1991, 1983, 1979). Bruce et al., (1976) and Cannistra, (1992) found identical reasons between men and women dropping out early into cardiac rehabilitation. However, the emphasis placed on the medical problems differed between the men and women. Medical problems were the number one reason women gave for dropping out of the program, whereas men reported medical problems as the third most dominant reason for dropping out early into the program. The medical problems reported by patients in the study by Bruce et al., (1976) were MI, cardiac arrest, angina, CABG, and pulmonary disease. Moreover, Cannistra, (1992) reported women who dropped out early into the cardiac rehabilitation program were more often hypertensive, diabetic, and had a higher cholesterol than men. They also experienced more angina before entry into the program than men.

Logistical

Compliance to a cardiac rehabilitation program may be affected by reasons other than medical. Andrew, (1981) reported inconvenience, job-related, time of program, financial considerations and parking problems as the reasons participants gave for not complying to the program. Oldridge, (1979, 1984, 1990) and Cannistra, (1992) noted location, time, shift work, change of job, relocation and distance traveled to the program as reasons for patients not complying to the cardiac rehabilitation program. The environment may also hamper the attendance of a patient, especially if the facility is located in a region where cold weather is common (Klinger, 1984). This factor may affect those individuals who try to comply with the recommended physical activities such as walking outside on days they are not scheduled for a cardiac rehabilitation exercise session. In doing so, some patients will experience angina in extremely cold temperatures. As previously mentioned, angina is one of the factors affecting compliance to exercise in cardiac rehabilitation programs.

Patient Characteristics

Certain characteristics, such as age, gender, marital status, and level of education, may give early indication of low compliance to exercise sessions. Conn, (1991) reported increased age as the most dominant factor affecting compliance among the 197 patients used in her study. The ages ranged from 40 to 88 with a mean age of 63.24. As the ages increased, there were more reported days of reduced activity, sickness, and more days spent in bed as a result of the sickness. In the same study, women reported having more sick days than did the males of the same age group (50-60 years.), however, the males were about six years younger. In a study by Ayanian, (1995) women undergoing a CABG were significantly older, had more severe angina, and had a recent MI than men. In a study by Oldridge, (1992) women who were less than 45 years old had a mean attendance of 18% in cardiac rehabilitation. As the age for women increased, so did the percent attendance. Women between the ages of 45 and 54 had a 46% attendance, whereas the women aged 55 and greater had the best attendance of 68% in the phase II cardiac rehabilitation program. Men of these same age groups had significantly higher attendance than the women. Females are more likely than males to have poorer attendance and/or completely drop out of a cardiac rehabilitation program (McGee, 1992; Oldridge, 1992, 1991, 1990, 1984, 1983, 1979; Andrew et al. 1981; Cannistra, 1992; Ades, 1992; O'Callaghan, 1984; Bruce et al., 1976). In addition, single females are more likely to drop out from a cardiac rehabilitation program than were single males (Conn, 1991).

Physician Referral

Physicians may play a key role for the patient who lacks social support. Physician referral or recommendation to a cardiac rehabilitation program has major impact on compliance. In a study by Ades, (1992) women reported having less physician recommendation to cardiac rehabilitation as compared to men in the same program. The patient's perceived physician's recommendation to cardiac rehabilitation was measured by using a Likert-type scale [1 to 5]. These patients completing the 12-week exercise study (3 hours/week of treadmill, cycle, and rowing at 70-90% of heart rate max.) had a mean score 4.7 ± 0.8, whereas the nonparticipants received a mean score of 1.9 ± 1.4. Physicians, however, recommended participation more strongly to older men (3.0 ± 1.8) than older women (2.3 ± 1.7). It seems that age and gender are significant predictors of physician recommendation. The age for the men was 68 ± 5 years [62 to 80] and women 70 ± 6 years [62 to 82].

People who are 65 and over, particularly women, see a physician more times per year than any other age cohort in the United States. It has been reported that women of all ages mention their physician's instructions as the main incentive to engage in exercise. This is found to be more true for women than men (Wolinsky et al, 1986). More importantly, both sexes adhere consistently to the advice of their physician as they grow older (Stephens et al., 1985). Given this fact, a physician's advice for a cardiac patient to engage in rehabilitation exercise could possibly eliminate a great deal of the compliance problems associated with cardiac rehabilitation. This will not take place until the physician believes in the benefits of exercise. Even after the numerous studies performed showing the benefits of exercise, many physicians point out that "no solid evidence on the benefits of exercise exist" (Johnson, 1976). This was true in an earlier study that reported only 3% of regular exercisers were advised by their physician to engage in physical activity (Clarke, 1973). However, this data is considerably outdated and probably doesn't reflect the attitude demonstrated by today's physician.

One could easily place the blame on most physicians for the compliance problems associated with cardiac rehabilitation programs. However, one must look closely at how physicians are trained in medical school. They are taught to treat and cure the sick, not to practice preventative medicine through exercise. While it is true that the advice of a physician is taken seriously by the elderly population, particularly women, the problem of compliance may still lie in the hands of the cardiac patient. Considering that increasing age and gender are key factors influencing attendance to cardiac rehabilitation, one must look at the effects of certain cohorts.

Cohort

Many people belonging to the 1920's cohort strongly believe in the power of medicine. In fact, these individuals may feel that a physician's prescription for medicine is the solution to all of their physical problems (Gillick, 1984). This is a more common belief among women than by men. Verbrugge, (1979) reported that women go to their physician more times, spend more days confined to bed, reports more illnesses, and are considered less healthy than men. This may give implication on why the majority of physicians never recommend exercise to their female patients. They may feel like the "sick" patient, i.e. female, will benefit more from bed rest rather than have them exercise.

It has been demonstrated by Oldridge, (1978, 1980) and O'Callaghan, (1984) that women have higher drop out rates and lower attendance rates than men from a cardiac rehabilitation program. The answer to the drop out/low attendance rates between the two genders may be supported by a cohort effect. Many older adults (65 or older) believe that physical activity and participation in sports are primarily male entities. Those physical activities which include bodily contact, requiring speed and strength are considered by most elderly people to be male-appropriate; non-contact, aesthetically pleasing sports such as golf and tennis are considered more female-appropriate (Ostrow, 1986). This viewpoint may have been internalized in both sexes from early childhood experiences. This may reflect the elderly population that we see today in cardiac rehabilitation programs. Females born in the 1920-1930's were influenced to "act like ladies" thus, never taking part in any physical activities that seemed masculine in nature, i.e. strength conditioning, exercising to the point of sweating. The females of this time were often given toys to play with which evoked fine motor skills, nurturing practices, and developed social skills, e.g., cooking, sewing. On the other hand, boys of this same cohort were encouraged to play with toys that promoted vigorous activities and exercised their gross motor skills (Vertinsky, 1988).

Viewing these differences between males and females of this cohort may answer why a majority of the cardiac rehabilitation population is made up of males.

Social Support

One variable which may control the way an individual adheres to lifestyle modifications is social support. Social support is defined as "those emotional and material resources provided by others" (Fleury, 1991). The support one receives from family and friends is the one variable that is consistently associated with cardiovascular risk factor modifications such as weight reduction, smoking cessation, and increased physical activity (Brownell, 1984; Miller, 1981; Coppotelli, 1985; Gianetti, 1985).

Social support is considered an important factor affecting the patient's ability to comply to cardiac rehabilitation. Heinzelman & Bagley, (1970) reported an 80% compliance when the spouse's attitude toward cardiac rehabilitation was positive, but only 40% compliance when the spouse's attitude was negative or neutral. While many studies have shown a variety of reasons why cardiac patients drop out of cardiac rehabilitation, social support consistently appears in the related literature as a significant factor affecting the patient's compliance (Andrew, 1981; Klinger, 1984; Hubbard, 1984; Oldridge, 1985; Fleury, 1991; Conn, 1991).

The association of lack of social support and CHD has been demonstrated in several studies. In a six year study by Orth-Gomer et al., (1993) men who suffered from an MI scored low on a social integration questionnaire. Those men who remained healthy, i.e., no CHD, scored high on the social integration questionnaire. In this same study, men reporting low social support had higher plasma fibrinogen and were smokers. Whether smoking or lack of social support was the contributing factor to the higher plasma fibrinogen levels was not demonstrated in this study. Cooper, (1985) demonstrated that inadequate emotional support from significant others caused the mortality rates of valvular diseased patients to increase. This study, like others mentioned previously, gives implication on the importance of social support and health. One may assume from these reports that perceived social support plays a role in promoting optimal health. This would be very important for the cardiac patient who is going through rehabilitation. The cardiac patient going through rehabilitation attends this health service because he or she wants their health to improve quickly and efficiently. Therefore, receiving the appropriate support should enhance their ability to comply since regular compliance to cardiac rehabilitation has been associated with greater improvements in efficient recovery and achievement of optimal health.

Gianetti, (1985) reported that cardiac patients receiving social support are more likely to comply to rehabilitation programs and risk-factor modification. This was demonstrated in a study by Williams et al., (1985) with female patients experiencing hypertension. Those females in the study, who reported having received support, were compliant with their treatment program more so than those females receiving no support. This perception of support reported by the hypertensive females may reflect the way they reciprocate the support. Friss and Taff, (1986) believe that reciprocity of social support may enhance one's perception towards the amount received. In other words, if the individual feels like he or she gives support to their significant other than their perception of the amount of support received is usually high.

Women may perceive social support differently than men. The type of social support must be addressed and defined in order to correctly identify the differences, if any, between men and women who comply and/or do not comply to cardiac rehabilitation programs. The effect of one's age may differentiate between the types of social support one feels. For an example, women over the age of 70 stand a good chance of being widowed before their onset of CHD occurs. This occurs because of the earlier incidence of CHD in men as compared to women (AHA, 1992; Castelli, 1988). In this case, the female cannot depend on a spouse for support. Instead, siblings, relatives, friends, or senior organizations fill the role of supporter. These circumstances can help or hinder women in complying to a cardiac rehabilitation program. The help can come from the support given by the siblings, relatives, and friends, whereas the hindrance comes from obligations associated with organizations, e.g. church functions, or perhaps taking care of other siblings and relatives who are confined to bed due to terminal illness.

Several studies have shown that women feel satisfied from their marriage if they perceive supportive behavior from their husbands (Barbee et al., 1993). However, some women and men equate receiving social support with being married without assessing the amount actually received (Acitelli & Antonucci, 1994). This can become confusing to the health care professionals, i.e. cardiac rehabilitation staff, who assesses the amount of social support being received while the patient is going through rehabilitation. Moreover, as people age, they have a tendency to break away from outside social links and concentrate on significant relationships (Carstensen, 1992).

Current literature is not consistent when determining if men or women receive more social support versus one another. It has been suggested that women place more importance on social support than do men (Mills et al., 1992). This may be explained by the possibility that men count on receiving their support from relationships at work, therefore, eliminating the need of social agencies, organizations or family members (Billings et al., 1982).

Interestingly, homeless women feel like they received little social support before they became homeless. They also felt that the social agencies offered more help to men than to women (Stovall & Flaherty, 1994). Of course, this finding cannot be linked with men and women going through cardiac rehabilitation. It may, however, have neuristic value in understanding how women in general feel about the amount of social support they receive during sickness and in health.

Summary

Regular attendance to cardiac rehabilitation by phase II patients is affected by many factors. Some of the more common factors reported by low complying patients are *life-style*, i.e., smoker, blue-collar worker; *perception of benefit*, i.e., disinterest and low self-motivation; *personality*, i.e., type-A, inactivity during leisure time; *medical problems*, i.e., obesity, arthritis, hypertension, angina; *logistical*, i.e., job-related, time of program, parking; *patient characteristics*, i.e., age, gender, single marital status, level of education; *physician referral*, i.e., not recommending exercise; *cohort*, i.e., people born in the 20's and 30's; and *social support*. Out of all of these factors reported in the literature, social support is consistently mentioned as one of the factors affecting patient adherence for men and women in cardiac rehabilitation.

CHAPTER 3

SOCIAL SUPPORT COMPARISONS BETWEEN MEN AND WOMEN IN PHASE II CARDIAC REHABILITATION

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(ABSTRACT)

Social support plays a key role in the rehabilitation of acute and chronically ill people. Generally, if one receives some type of social support then he or she is more likely to improve their physical, emotional, and/or psychological well-being during the rehabilitative phase. The type and amount of social support the cardiac patient perceives may affect participation in cardiac rehabilitation.

The purpose of this study was to 1) determine if there was a difference between the amount of social support perceived by men and women entering a phase II cardiac rehabilitation exercise program 2) to examine the relationship between social support and the first four weeks of rehabilitation compliance. A sample (n = 29) of twenty two men (63.1 y.o. ± 10.1) and seven women (70.4 y.o. ± 11.4) voluntarily completed the Medical Outcomes Study (MOS) Social Support Survey as they entered into the phase II programs. The sample population consisted of patients with one or more of the following characteristics: MI (76%), CABG (59%), PVD (21%), PTCA (28 %), diabetes (21 %),

hypertension (48 %), and angina (41 %). Two sites were used in the study; one urban and one rural. Each program session consisted of 60 minutes of exercise which consisted of flexibility, cardiovascular, and strength conditioning routines. All sessions were monitored by exercise specialists and registered nurses. Classes met three times per week on Monday, Wednesday, and Friday. As patients entered the programs, they were administered the MOS Survey which consists of 19 questions that address four types of social support -- *tangible, affection, positive interaction, and emotional.* Each patient's attendance was recorded from initial entry to the end of four weeks.

Data collection began in February 1995 and ended in May 1995. The results of the study demonstrated that there were no significant differences between men and women and their perception of social support at entry into the program. The mean total social support scores for men and women were 314.1 ± 85.2 and 307.1 ± 47.0 ($p = 0.84$), respectively out of a possible 400. There was no significant relationship between men and women and their compliance to the program ($\chi^2 = 3.15$, $df = 2$; $p = 0.21$). In addition, there was no significant relationship between low, medium, and high compliers and their overall social support scores ($p = 0.41$). Results from these analyses should be viewed with caution as sample sizes were small.

In conclusion, this study did not find that social support was associated with cardiac rehabilitation compliance. However, low entry rates into both programs and the extended length of the study resulted in very low sample sizes. Hence, the analyses may not have had sufficient statistical power to identify differences and make valid comparisons.

Introduction

In 1989, nearly one-half million people in the US died from coronary heart disease (CHD).[1] Historically, CHD has been thought to be primarily a problem for men. It was estimated in 1989 that 440,000 men age 65 and older suffered a myocardial infarction (MI) while those men between the ages of 45-64 suffered 424,000 MI's.[1] However, CHD also strongly affects the mortality of women over 65 years of age. In fact, myocardial infarction is the number one killer of American women. The number of MI's occurring in 1989 among women over the age of 65 was 374,000. The number of MI's occurring in women between the ages of 45 and 64 was estimated to be 136,000. In addition, those women age 29 - 44 experienced approximately 3,000 MI's.

The number of cardiovascular events occurring in the US reflect the importance for survivors of a morbid event and/or reverse surgery, to have access to and benefit from secondary prevention and rehabilitation effects. The cardiac patient may benefit from rehabilitative services only if he or she complies on a regular basis.[9] By participating in a cardiac rehabilitation program, patients are capable of improving functional capacity and reducing risk factors associated with reoccurring cardiac events, (i.e., sequential MI's, occlusion of coronary grafts).[2] However, attendance to exercise sessions usually is inconsistent during the first year of cardiac rehabilitation, particularly for females. Even though women, after age 65 years, experience as many MI's as men, females are less likely to attend phases II, III, and IV cardiac rehabilitation than males.[3,4,5]

Several reasons have been suggested why females attend cardiac rehabilitation less than males. These include lack of physician recommendation, less fit than males upon initial entry of exercise program, older age, experience more depression, and lack of social support.[6,7,8,9] Social support has been thought to have the most significant affect on the cardiac patient's attendance than any other factor. Other factors that have an affect on patient compliance to exercise programs are medical problems, smoker, overweight, low motivation, work related and financial difficulties[7,10,11,12,13,14] It is the purpose of this study to measure the amount of social support perceived by a group of men and women at two different phase II cardiac rehabilitation programs and determine if it is associated with patient attendance to the exercise portion of the program.

Procedures

Study Population

A convenience sample (n=29) of twenty-two men and seven women were recruited as they enrolled into the phase II cardiac rehabilitation programs located in Chattanooga, Tennessee and Radford, Virginia. Over four months the selection of the subjects was based on each new participant voluntarily completing the Medical Objective Survey (MOS) Social Support questionnaire.[15] No one from either site refused to volunteer or was excluded from the study. All subjects were at least 18 years old and represented the typical cardiac rehabilitation patient. i.e., MI, CABG, PTCA, etc. (*see Table1*).

Patients were evaluated before entry into the phase II program using an initial assessment form which was used by both hospitals' cardiac rehabilitation programs to gather demographic information such as, age, gender, marital status, occupation, etc. Physical status of the patient such as recent cardiac event, hypertension, diabetes, hypercholesterolemia, etc., was also gathered from the initial assessment form as part of the study. This information is routinely gathered as part of the procedures involved with enrollment of new patients into the phase II program.

Sites Used in Study

One of the phase II programs used in the study was Memorial Hospital's Cardiac Rehabilitation program located in Chattanooga, Tennessee. The five year old facility located in the downtown area of Chattanooga offers phases I, II, and III cardiac rehabilitation. Phase II sessions are offered three times per week on Monday, Wednesday, and Friday and usually last one hour. Patients are taken through circuit training which consist of treadmills, rowers, cycle ergometers, arm ergometers, stepping machines and step benches. The facility also offers Cybex weight training machines and free weights for muscular strength training. In addition to the exercise equipment offered to the patients, health education classes (e.g., stress management) are taught weekly. The staff consist of an Administrative Assistant, two Exercise Specialists, one ECG technician, two Registered Nurses, one Registered Dietitian, and four undergraduate interns. The program receives approximately ten new patients monthly.

The phase II program located at Radford Hospital located in Radford, Virginia is smaller in size as compared to Memorial Hospital's program. Patients can chose between the treadmills or Airdyne bicycles for their cardiovascular workout. Flexibility and strength training is performed using calisthenics routines as well as Dynaband resistant rubber cords. The sessions meet three times per week on Monday, Wednesday, and Friday for one hour. The program consist of one Exercise Specialist and one Registered Nurse. Classes are taught on risk factor modification once per week.

Instruments

Each new patient entering the phase II program was asked to complete the MOS Social Support Survey. The MOS survey includes 19 questions regarding four dimensions of social (functional) support: 1) tangible -- (ex. Someone to prepare meals), 2) affection -- (ex. Someone who shows love, gives hugs), 3) positive interaction -- (ex. Someone to have a good time with), 4) emotional -- (ex. Someone to listen, give advice in a crisis). Questions were measured using a 5 - point Likert-type scale. The total score received on the survey could range from 0 to 400, with scores on each subscale being 0-100. The total score was determined by converting the raw scores into a conversion score for each of the four subscales. Receiving a 400 score on the MOS survey would indicate the highest possible support perceived. The MOS total score was the sum of the four conversion scores.[15] Three other questions asked the participant to give a specific number regarding family members available and living at home while a third question asked for marital status. These last two questions focus on the structure of interpersonal relationships. The items chosen for this survey were designed to be as comprehensive as possible, yet short enough to reduce patient boredom.

Validity of the instrument was demonstrated in the original development of the MOS social support survey by hypothesizing that certain health concept variables are related to social support.[15] These health concept variables were included in a pilot study conducted in a rural health clinic located in Illinois. Along with these health concept variables 37 functional support items were included which measured social support. The pilot study consisted of administering the questions regarding social support and general health to patients visiting the clinic. The results of the pilot study helped eliminate those items that were not related to social support. Some of the health concept validity variables used to measure the survey's validity were loneliness, emotional ties, family and marital functioning, and family happiness. These variables are thought to be related or linked to social support. Whereas other health concept variables such as physical well-being, current health, and pain severity are not associated with social support. Pearson Product-Moment correlations between social support measures and health concept measures were significant at ($p < 0.01$). This significance was observed after administering the MOS to 2,987 subjects over a one year period in three different sites.[15]

Cronbach's Alpha coefficient was used to estimate internal-consistency reliability between subscale scores received during the original study involving three sites and approximately 3,000 subjects. Results indicate an overall index subscale score to be reliable ($\alpha = 0.97$). Along with Cronbach's Alpha coefficient, one year stability coefficients were determined using a Pearson Product Moment correlation analysis. This analysis was performed to measure if support measures correlated with initial enrollment support measures and one year later after the MOS survey was administered again to the same subjects. Results indicated a (r = 0.78) stability coefficient.

In the present study, a Pearson Product Moment correlation was performed to determine if there was a relationship among the four subscale scores. Because a significant relationship was found among the four subscale scores (r = 0.81-0.85), an overall index score was applied to determine the amount of social support perceived by the subject. In addition to the overall index score, each subscale score was measured to assess if any differences occurred between men and women and the four dimensions of social support (*see Appendix H*). Sherbourne and Stewart, (1991) used multitrait and factor analyses to formulate an overall index score for all subscales.[15] These high correlations among the four subscale scores supported the construction of an overall index score.

Compliance

Patients were defined as being a low, medium, or high complier based on the mean number of sessions attended. Each subject had the chance to attend a total of 12 sessions during the study. This was approximately one month of phase II rehabilitation. To determine categorization of patient compliance, the group's mean attendance was determined. The mean number of sessions completed by all subjects was 9.1 ± 3.6 SD. Since taking ± 1 standard deviation from the mean would cause the range to exceed the total number of possible sessions, ± 0.5 standard deviation from the mean was used to determine category of compliance. Low complier = ≤ 7 sessions, medium = 8-10 sessions, and high = 11-12 sessions attended out of 12 sessions.

Statistics

Total scores from the MOS survey were compared between men and women using a paired t-test ($\alpha < 0.05$). A nonparametric test using Chi-square ($\alpha = 0.05$) was performed to compare the relationship between men and women and the categorization of compliance. In addition, a one-way ANOVA ($\alpha < 0.05$) was performed to compare differences among the three levels of compliance and total social support scores. MiniTab version 10 for windows was used to perform all statistical tests.[16]

Results

MOS scores and compliance

The 22 men and 7 women who participated in the study had a mean age 63.6 years ± 11.1 with the women having an older mean age of 70.4 ± 11.4 versus that of the men 61.3 ± 10.1 ($p = 0.06$; *see Table 1*).

When the total scores from the MOS survey of men were compared with that of women, no significant differences were found. Men had a mean total score of 314.1 ± 85.2 versus 307.1 ± 47.0 for women ($p = 0.84$; *see Table 2*). These total scores are higher as compared to the original study by Sherbourne and Stewart, (1991) which subjects scored 282.9 out of a possible 400. Scores for each of the four subscales for both men and women are presented in *Figure 1*. There was no relationship between men and women and the three categories of compliance ($\chi^2 = 3.15$, $df = 2$; $p = 0.21$; *see Table 3)*.

In addition to these comparisons, there were no significant differences between the low, medium, and high compliance of all subjects and their total social support scores ($p = 0.41$; *see Table 4)*.

Secondary Analysis

Social Support and Marital Status

Observations were made comparing married men and married women's MOS scores. No statistically significant differences were found between the two groups ($p = 0.35$). The lack of significance between the two married groups may be due to small sample size. The interpretation of this data should be viewed cautiously since the analysis lacked the desired power of (0.80).

Radford versus Chattanooga

Interestingly, the subjects ($n = 8$) at Radford Hospital Cardiac Rehabilitation scored significantly lower on the MOS social support scale than the subjects ($n = 21$) at Chattanooga's Memorial Hospital Cardiac Rehabilitation. The group at Radford had a mean total score of 262.6 ± 81.3 versus 333.4 ± 66.9 for Chattanooga's group ($p < 0.05$).

Discussion

Social support has been shown to be an important variable associated with weight loss, smoking cessation, and successful cardiac rehabilitation.[18] Regular compliance to a cardiac rehabilitation program, which has been associated with perceived social support, would contribute enormously to a successful cardiac rehabilitation experience.[19,11,10] Other studies have found that lack of social support led to higher incidences of major coronary risk factors, (i.e., hyperlipidemia, smoking, hypertension).[20] Some studies suggest that men and women perceive different amounts of social support.[21] These differences in the amount of social support perceived may indicate why women attend cardiac rehabilitation exercise sessions less often then men.[4] Still, other studies have suggested that the amount of social support one perceives may predict whether or not that person will drop out from an exercise program.[22,23] It is important to note that other factors such as patient characteristics could have influenced the adherence to exercise for some subjects (*see Table 1*).

In this study, it was suggested that approximately 35% of the men and women entering phase II cardiac rehabilitation would probably drop out within the first four weeks. This high percent of dropout has been shown in others studies looking at compliance to cardiac rehabilitation.[17,24,22,25] Several factors are associated with the high incidence of dropout or low compliance (less than 50% attendance). Studies by Oldridge suggest program type, staff, facilities, lack of support, job-related, motivation, blue-collar worker, smoker, overweight and angina are all contributing factors associated with dropout.[9,22] However, social support is consistently cited as a common factor associated with dropout from the cardiac rehabilitation program. The same results appear to be true in studies by Andrew and Bruce.[10,17]

Compliance

The overall attendance for both groups was 76.2%. This was above the 50% compliance percentage seen in various groups attending cardiac rehabilitation.[11] The high percentage of compliance seen in the study groups may be a reflection of the study's limited number of sessions since other studies look at patient compliance over a twelve week period. Nevertheless, the dropout rates for both sites were recorded at 10%, whereas other studies have found as high as a 35% dropout rate in the first month of a phase II population.[17,8]

The low, medium and high compliers in the study did not score significantly different from one another on the MOS survey. This may be the result of administering the survey before the subjects started their phase II sessions. Patients may have the same perception of social support when beginning their initial rehabilitative phase. After completing a number of sessions, the social support that was present in the beginning from friends, relatives and support groups may have dwindled or ceased all together. This could explain the differences in the level of compliance.

No relationship existed between men and women and the three levels of compliance, perhaps from a limited number of subjects. However, interpreting the percentages of males with low compliance as compared with females with low compliance is problematic. The same is true for males with high compliance versus females with high compliance. The percentage of males with low compliance versus females with low compliance are 13.6% and 42.9%, respectfully. Males with high compliance versus females with compliance were 59.1% and 28.5%, respectfully. This pattern of compliance with male versus female reflects what is typically seen in a phase II exercise program which shows males averaging 59% of the scheduled sessions vs. 41% for females.[7]

Gender Differences

The observations made in this study showed no significant differences between men and women and the amount of social support perceived before entering the phase II cardiac rehabilitation programs. This finding may not be specific to cardiac patients. However, it has been demonstrated that women place more emphasis on social support than men. This emphasis on social support is noted in studies that have reported men and women's quality of marital life and their relationship with their spouse.[26,27,28]

Being married can affect the way one perceives his or her social support. Previous research has reported that cardiac patients, particularly women, experiencing widowhood score lower on quality of life instruments than married patients.[29,30] Quality of life (QOL) instruments measure different dimensions of life such as health and functioning, socioeconomic, psychological, spiritual, and family. The family dimension measured in QOL instruments usually reflects the amount of social support one perceives from his or her family members.

Logistical Differences

This study did show significant differences between the two groups used in the study. Those participants at Chattanooga's Heart Institute had a higher MOS score than Radford's Cardiac Rehabilitation facility.

There are several possibilities why the subjects in Chattanooga may have scored higher than Radford's subjects. First, there were only 8 subjects from Radford as compared to 21 from Chattanooga. Although these findings were statistically significant, the number of subjects at Radford's facility may be too little to draw any conclusions. Second, the administration of the survey was given to the patients at different times during their orientation into phase II. Chattanooga's subjects had the MOS survey given to them at the beginning of orientation, whereas the subjects at Radford were given the survey after approximately ninety minutes of phase II orientation. The subjects at Chattanooga may have given more thought to the questions since the survey was one of the first pieces of paperwork they had to complete before entry into the program. The Radford subjects may have been overwhelmed with the introductory paperwork and exercise information therefore, placing less thought into each question on the survey. Thirdly, larger cities and urban communities versus smaller towns and rural communities may offer more resources pertaining to social support. Resource examples may include social clubs, i.e., YMCAs' and YWCAs', organized hospital support groups, and larger workplaces.

Social Support and Marital Status

Several analyses were performed between the subject's marital status and their MOS scores. Previous research has demonstrated that married men experience more social support than married woman because married women are usually the better caregivers and are accustomed to domestic roles.[29] Social support differences were found in the present study where the married men had significantly higher scores on the MOS survey than the widowed women (344.6 ± 49.5 vs. 282.5 ± 23.6, $p = 0.02$). However, widowed women may be at a disadvantage compared to married men because of the lack of spousal support. In addition to this finding, married men's MOS scores where compared to divorced men's scores. There was a statistically significant difference between the two groups. The married men had a mean score of 344.6 ± 49.5 versus 219.3 ± 79.4 ($p = 0.001$) of those divorced. The number of married men compared to divorced men in this study was 19 and 3, respectively.

Limitations And Implications

These findings cannot be generalized to all cardiac patients entering phase II rehabilitation. This study was limited to a small sample size, particularly with respect to a low number of female subjects. In addition, it is conceivable that different findings could have been found if the survey was issued after longer time spent in the phase II programs. Perhaps the survey would have yielded different scores between men and women if the survey was administered during the phase I rehabilitative stage through the end of phase II or possibly phase III. In the original development of the MOS survey, Sherbourne and Stewart observed differences in social support between men and women. Males scored higher than females; married subjects higher than unmarried subjects; and older (greater than 45) higher than younger patients (less than 45).[15] These differences were observed after having the subjects complete the survey upon enrollment into the study and again one year later.

The findings in this study do not support the value of social support in predicting compliance to phase II rehabilitation. However, several studies support the belief that social support plays a key role in regular attendance to rehabilitative exercise programs.[17,19,22] healthcare providers in cardiac rehabilitation need to be aware of social support's effectiveness towards patient compliance. Moreover, women going through cardiac rehabilitation may be experiencing less social support than their male counterparts, thus may need more support to help them attend exercise sessions on a regular basis. It may be necessary for the staff of phase II programs to offer social support services to phase I patients before they enter into phase II.

Results from this study do not lend support to the theory that lack of social support causes poor compliance to phase II rehabilitation. However, this study only measured patients perceived social support upon entry into the phase II program. Their perception of support could have changed after going through phase II and into phase III rehabilitation. It may be necessary for cardiac rehabilitation staff to assess the patient's perception of social support all the way through the rehabilitative phases.

Table 1. Patient characteristics

Characteristic	Male (%)	Female (%)
	n =22	n =7
MI	16 (73)	6 (86)
CABG	13 (59)	4 (57)
PTCA	7 (32)	1 (14)
PVD	3 (14)	3 (43)
Diabetes	6 (27)	0 (0)
Hypertension	11 (50)	3 (43)
Angina	9 (41)	3 (43)
Smoker	1 (5)	1 (14)
Married	19 (86)	2 (29)
Single	0 (0)	1 (14)
Widowed	0 (0)	4 (57)
Divorced	3 (14)	0 (0)
* Age	61.3	70.4
Blue Collar Worker	8 (36)	0
White Collar Worker	7 (32)	1 (14)
Retired	7 (32)	6 (86)

* There were no statistical significances in the ages of men and women ($p = 0.06$).

Table 2. Comparison of men and women's MOS total scores.

Group	N	Mean	Std Dev	SEM
Male	22	314.1	85.2	18.2
Female	7	307.1	47.0	17.8
Difference		7.0		

Paired t-test ($p = 0.83$)

Table 3. Distribution of cardiac rehabilitation compliance between men and women.

Subjects	Male	Female
Low	14% (n = 3)	42% (n = 3)
Medium	27% (n = 6)	29% (n = 2)
High	59% (n = 13)	29% (n = 2)

Chi-square level of significance ($p = 0.21$)

Table 4. Subject compliance and total MOS scores.

		MOS scores	
Level of compliance		**Mean**	**SD**
Low	6	277	71.5
Medium	8	334	113.6
High	15	314	52.8

ANOVA level of significance ($p = 0.41$)

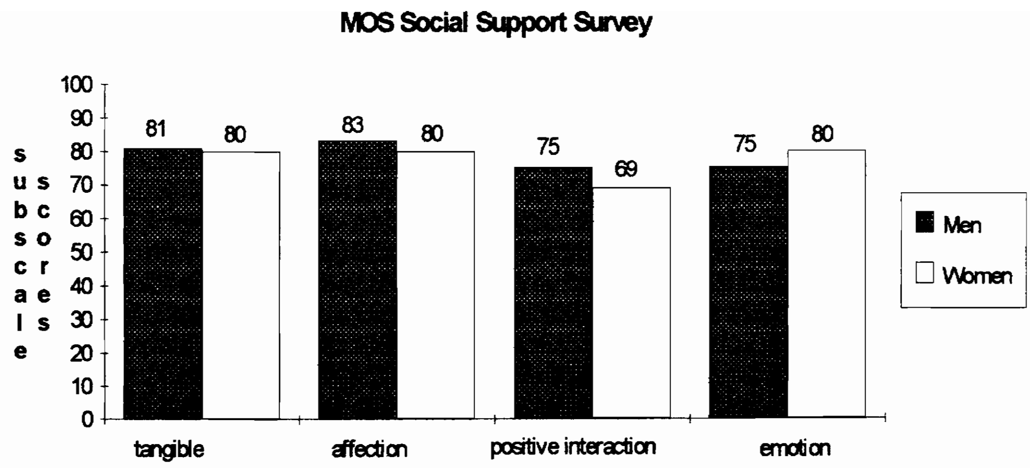

Figure 1. MOS subscale scores of men and women.

Summary

In summary, most literature suggests that social support does play a key role in the way cardiac patients attend rehabilitation. Even though previous studies have shown that men have a higher attendance to cardiac rehabilitation than women, this study did not show any significant differences between the two genders and their compliance. This study also demonstrated no significant differences between men and women and the amount of social support they perceived before entering the phase II cardiac rehabilitation programs.

Marital status and total social support scores did reveal some significant differences among the groups. Married men scored significantly higher than divorced men and widowed women. In conclusion, data representing the amount of social support perceived by cardiac men and women in this study was limited due to the low number of subjects participating in the MOS survey. These analyses may not have had sufficient statistical power to support the findings and make valid comparisons.

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CHAPTER 4
Results and Discussion

Summary Of Study

Twenty-two men and seven women were given the MOS social support survey as they entered the phase II cardiac rehabilitation programs located in Chattanooga, Tennessee and Radford, Virginia. Scores from the survey were compared with the patient's attendance to the exercise programs. These comparisons were made to measure the relationship between men's and women's perception of social support and if the amount of support perceived reflected the amount of exercise sessions attended. Further comparisons were made to determine if differences in levels of compliance reflected the total score received on the MOS survey. Attendance for each patient was recorded from sessions 1 through 12. This amounted to about one month of phase II cardiac rehabilitation.

Three null hypotheses were tested during the study. The first hypothesis proposed that no differences occur in the amount of social support perceived between men and women entering into a phase II cardiac rehabilitation program. The second hypothesis proposed that there was no relationship between men and women and level of compliance. Last, the third hypothesis proposed that there is no difference between all low, medium, and high compliers and their perception of social support.

Results of the study showed no significant differences between men and women and the amount of social support they perceived before entering into the phase II cardiac rehabilitation programs. A Chi-square analysis was performed to determine if a relationship existed between men and women and the three levels of compliance. Results from this analysis showed no significant differences among the three groups. There was no relationship between total MOS scores of all subjects and the level of compliance to the exercise sessions.

Discussion

It has been well-documented that certain factors such as smoker, blue-collar worker, overweight, angina, physical inactivity, and lack of social support affect patient compliance to phase II cardiac exercise programs (Oldridge, 1991; Andrew et al, 1981; Bruce et al, 1976). Out of all of these factors, lack of social support appears consistently in the literature as an important factor affecting patient compliance to cardiac rehabilitation (Oldridge & Steiner, 1990; Fleury, 1991; Conn et al, 1991; Godin & Shepherd, 1985; O'Callaghan, 1984).

In the present study social support was measured using the Medical Outcomes Study (MOS) Social Support Survey. Differences in perceived social support were not shown between men and women upon their initial entry into the phase II cardiac rehabilitation programs. This is supported by a previous study performed by Hilbert, (1985) in which there were no significant differences between men's and women's perception of social support. Unlike the Hilbert study and the present study, the majority of studies measuring compliance factors usually show the level of social support to be different between men and women. Acitelli and Antonucci, (1994) found that women perceived less support than men and that this was related to marital satisfaction. Social support between men and women in cardiac rehabilitation has not been investigated enough to draw conclusions that indicate differences. However, the literature does indicate that social support may be the most important factor that determines the compliance to exercise in cardiac rehabilitation. Klinger, (1984) cited social support as the most important factor affecting the patient's attendance to exercise classes. Other studies dating back as early as 1970 have shown that lack of social support was the leading cause of low compliance to cardiac rehabilitation (Heinzelmann & Bagley, 1970). Recent studies determining the reasons why patients do not attend exercise sessions on a regular basis still show lack of social support being the most dominating factor involved with patient compliance to cardiac rehabilitation exercise programs (Oldridge, 1984; Andrew et al, 1981; O'Callghan, 1984; Conn, 1991; Daltroy, 1991; Godin & Shepherd, 1985). These studies do not support the third hypothesis in the present study where the amount of perceived social support did not reflect the patient's compliance to exercise. Perhaps other factors played key roles in patient compliance. The type of exercise program, facilities, and staff personalities can have an affect on patient compliance (Oldridge, 1984).

No significant differences were found in the present study between the amount of perceived social support among all subjects and the three levels of compliance. This third hypothesis is difficult to address since no agreement has been made in the literature supporting one definition for compliance. This study placed the patients into three categories of compliance: low, medium, and high. Three categories were needed because of the limited number of sessions. It has been shown that most phase II cardiac patients do not attend regularly during the first month of rehabilitation (Bruce et al, 1976). This was the basis of this study; to determine if social support affected compliance during the first month of rehabilitation.

The only social support differences that were found in the study were between married men and widowed women and married men and divorced men. These differences were significant, however, the number of married men compared to widowed women and divorced men were 19, 4, and 3, respectively. Due to these small sample sizes, one should view these results with caution since the level of desired power is below (0.80). Andrew et al, (1981) found the rate of dropout to be three times greater if the spouse had little or no spousal support compared to those who had some form of support from their spouse or families. Heinzelmann and Bagley, (1970) observed three times poorer attendance among married men in exercise programs where the spouse was not supportive compared to those men whose wives were supportive. In the present study it is difficult to make conclusions regarding these differences since the number of subjects analyzed were limited. Also, the MOS Survey did not ask questions specifically related to spousal support.

In regards to other reasons affecting compliance of patients in phase II programs, one must consider other patient characteristics (i.e., MI, smoker, angina) that could have played a key role in their adherence to attend the exercise sessions.

Recommendations For Future Research

Planning future research in the area of social support and the cardiac patient will require the administration of several types of instruments. Researchers need to know what kind of instrument to use when a patient is coming out of a phase I cardiac rehabilitation and into a phase II. The type of social support perceived can change from one phase to another. At first, the patient is usually supported by the spouse, family, and close relatives while staying in the hospital. After leaving phase I, the patient may enter a phase II exercise program. Here, the patient may still rely on the spouse for most of the support (Klinger, 1984). Often, close friends, co-workers, members of the patient's church and local organizations fill the roll of supporter. Perhaps a medical professional from a cardiac rehabilitation program will become the supporter. Whoever the supporter may be, the researcher needs to measure the correct type of support by choosing the appropriate instrument. The instrument should, however be concise, easy to understand, and brief so that the patient does not become bored. Keep in mind, the cardiac patient is normally bombarded with filling out paper work and insurance forms. Choosing a lengthy survey could create patient boredom and possibly dropout from the study.

The use of the MOS Survey during the present study was effective in retrieving the appropriate information. However, in order to measure the patient's growth of support throughout the program, the MOS Survey could have been administered on two separate occasions. Once upon the patient's initial entry into the exercise program and once again at the end of the 36 sessions. By giving the MOS once again to the patient completing the program, one could track the attendance over the entire 12 weeks of phase II. Changes in attendance may have been seen if the present study was conducted longer.

Another suggestion for the administration of the MOS Survey is to have patients complete the survey while in Phase I rehabilitation, twice while in Phase II, and twice more if they entered Phase III. While doing so, compliance could be tracked for the entire visitation in all phases. Comparisons could then be made to see if differences occur between phase I, II, and III.

Perhaps the most important factor missing in the present study was the number of women. Women are having as many heart attacks as men after they reach age 65. Still, the number of women entering cardiac rehabilitation is discouraging. This may be the result of many factors such as age of first cardiac event (AHA, 1991) physical condition after experiencing an MI (Schuster and Waldron, 1991) or perhaps the most dominating factor, the lack of physician referral (Ades et al, 1992). Continuing on with the study for a one year period could produce the appropriate number of females needed to yield significant results. Another suggestion would be to combine other hospital sites in the study to increase sample size thus increasing the power desired for statistically significant analyses.

Another limitation in the present study was the fact that none of the patient's reasons for missed days were documented. We can only assume that absenteeism was caused from lack of support. Otherwise, sickness, doctor's appointment, transportation problems, and or personal obligations could be the determining factor for the lack of compliance. A documented reason for missing scheduled sessions should be tracked throughout the duration of future studies.

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APPENDIX A

Methodology

Selection of subjects

A convenience sample of twenty-two men and seven women were recruited sequencially as they enrolled into the phase II cardiac rehabilitation programs located in Chattanooga, Tennessee and Radford, Virginia. The 22 men and 7 women who participated in the study had a mean age of 63.6 years ± 11.1 with the women having an older mean age of 70.4 years ± 11.4 versus that of the men 61.3 ± 10.1 ($p = 0.06$). All of the twenty nine subjects in the convenience sample voluntarily completed the Medical Objective Survey (MOS) Social Support questionnaire (Sherbourne & Stewart, 1991; *see Appendix D*) before entering the phase II program. All subjects were at least 18 years old and qualified for phase II cardiac rehabilitation by experiencing one or more cardiac events, risk factor(s), and/or symptoms such as an MI, CABG, PTCA, hypertension, hypercholesterolemia, angina, etc. *(see Table1).*

Patient Screening and Orientation

Patients were evaluated before entry into the phase II program. An initial assessment form was used by both hospitals' cardiac rehabilitation programs to gather demographic information such as, age, gender, marital status, occupation, etc. *(see Appendix F).* Physical status of the patient such as recent cardiac event, hypertension, diabetes, hypercholesterolemia, etc., was also gathered from the initial assessment form as part of the study. This information is routinely gathered as part of the procedures involved with enrollment of new patients into the phase II programs.

Patients were given an opportunity to ask questions before completing the MOS survey. Each item from the checklist *(see Appendix B)* was reviewed with the patient before the survey was administered. In addition to the checklist, a written informed consent form *(see Appendix C)* was given to each subject before the MOS survey was administered.

All interns who administered the MOS survey in this study were required to follow the objectives set forth on the procedures form *(see Appendix E)*. Patients were told to answer each question as accurate as possible using a Likert-type scoring system where the number 1 represented "none of the time"; 2 "little of the time"; 3 "some of the time"; 4 "most of the time"; and 5 "all of the time". Raw scores from the MOS survey were transformed into a conversion score for each of the four subscales. The total MOS score was the sum of all subscale scores *(see Appendix G)*. Each patient completed the survey in a private area and was given as much time as they needed to answer all questions. The interns were to administer and collect the surveys. In no way were they to offer their opinion to any of the questions on the MOS survey. The surveys were given out to the subjects on their initial visit to the program.

Scores and Analyses

The raw MOS scores were changed into conversion scores with a range of 0-400. An example of the total score conversion is shown in Table 5.

Total scores from the MOS survey were compared between men and women using a paired t-test ($\alpha < 0.05$). A nonparametric test using Chi-square ($\alpha = 0.05$) was performed to compare the relationship between men and women and the categorization of compliance *(see Table3)*. In addition, a one-way ANOVA ($p < 0.05$) was performed to compare differences among the three levels of compliance and total social support scores. *(see Table 4)*.

Compliance

Patients were defined as being a low, medium, or high complier based on the mean number of sessions attended. Each subject had the chance to attend a total of 12 sessions during the study. This was approximately one month of phase II rehabilitation. To determine categorization of patient compliance, the group's mean attendance was determined. The mean number of sessions completed by all subjects was 9.1 ± 3.6 SD. Since taking $\pm$ 1 standard deviation from the mean would cause the range to exceed the total number of possible sessions, $\pm$ 0.5 standard deviation from the mean was used to determine category of compliance. Low complier = ≤ 7 sessions, medium = 8-10 sessions, and high = 11-12 sessions attended out of 12 sessions.

APPENDIX B

MOS STUDY CHECKLIST

The undergraduate interns selected to conduct the MOS Survey must mention the following items to the participants involved in the study. Please check (✓) the items as completed. All completed forms will be signed and dated by the intern.

______Memorial Hospital and the Director of Cardiac Rehabilitation has approved the study.

______This study is being conducted by a Virginia Tech Graduate student.

______Involvement in the study is strictly voluntary.

______Names will not be used in the study and confidentiality will be practiced thoroughly.

______The written informed consent form will be kept separate from all other forms used in the study.

______The study uses a survey to measure the amount of support that is available to you when beginning the phase II program.

______The survey is self-administered and contains 19 questions.

______You have the right to refuse to participate in the study.

Do you have any questions?

COMMENTS:

INTERN SIGNATURE____DATE____________

APPENDIX C

HUMAN PERFORMANCE LABORATORY

Department of Human Nutrition & Foods
Virginia Polytechnic Institute and State University

INFORMED CONSENT

I, ________________________________, do hereby voluntarily agree and consent to participate in a testing program conducted by the personnel of the Human Performance Laboratory of the Department of Human Nutrition and Foods of Virginia Polytechnic Institute and State University.

Title of study:

Social Support Comparisons Between Men and Women In Phase II Cardiac Rehabilitation

Purpose of this investigation:

Certain aspects of a person's life have been found to affect success in cardiac rehabilitation. The purpose of this study is to determine how the support of others influence your ability to achieve cardiac rehabilitative goals.

I voluntarily agree to participate in this testing program. It is my understanding that my participation will include:

1. The participant will complete the Medical Outcomes Study (MOS) questionnaire upon the initial entry into the phase II cardiac rehabilitation program at Memorial Hospital's Cardiac Rehabilitation located in Chattanooga, Tennessee or at Radford Community Hospital's Cardiac Rehabilitation located in Radford, Virginia. Staff members of the program will offer assistance through the entire completion of the questionnaire and answer questions you may have while completing the questionnaire.

2. After completing the questionnaire, the participant will complete the initial assessment form issued to new patients entering into Memorial or Radford Hospital's Cardiac Rehabilitation phase II programs. The administration of this form is a routine procedure used in the enrollment of new participants entering the phase II program. This information will be used both for your clinical care as needed and to provide further understanding of factors which may influence cardiac rehabilitation success.

3. Cardiac rehabilitation staff will follow your progress throughout your stay in the program. In addition, your attendance in the program will be assessed from the beginning of the study to the end of the study.

I understand that there is little risk from participation in this investigation. Surveys will be self-administered and handled by Memorial Hospital's or Radford Hospital's Cardiac Rehabilitation staff and interns. Every participant will receive a number as their identification on the survey and anonymity procedures will be practiced thoroughly. All participant names will remain anonymous (unknown) if the results of the study are published.

Certain personal benefits may be expected from the participation in this investigation. These benefits include:

Subjects may request feedback regarding their social support scores received from the questionnaire. Each type of support measured will be individually scored. A norm chart will be provided so that participants can observe how they compared against other individuals used in the study.

I also understand that I am free to withdraw from this study, or not answer questions, at any time.

I understand that any data of personal nature will be held confidential and will be used for research purposes only. I also understand that these data may only be used when not identifiable with me.

I understand that it is my personal responsibility to advise the researchers of any preexisting medical problem that may affect my participation or of any medical problems that might arise in the course of this investigation.

I have read the above statements and have the opportunity to ask questions. I understand that the researchers will, at any time, answer my inquiries concerning the procedures used in this investigation.

Scientific inquiry is indispensable to the advancement of knowledge. Your participation in this investigation provides the investigator the opportunity to conduct meaningful scientific observations designed to make a significant educational contribution.

If you would like to receive the results of this investigation, please indicate this choice by marking in the appropriate space provided below. A copy will then be distributed to you as soon as the results are made available by the investigator. Thank you for making this important contribution.

______ I request a copy of the results of this study.

Date____________________ Time_____________a.m. / p.m.

Participant Signature_____________________________________

Witness___________________________________

Memorial Hospital or Radford Hospital Cardiac Rehabilitation Staff

Project Director___**Mark T. Ervin**_______ Telephone **(770) 932-8237 (home)**

HNF Faculty Sponsor: Douglas R. Southard; Telephone (540) 231-4254

Dr. Ernest R. Stout, Chairman, Institutional Review Board for Research Involving Human Subjects. Telephone (540) 231-9359 (office)

APPENDIX D

VIRGINIA TECH

Adult Fitness / Rehabilitative Exercise

Thesis Study By: Mark T. Ervin - Graduate Student

ENTRY DATE:__________

male ☐ female ☐ (check the correct box) **patient #________________**

Medical Outcomes Study (MOS) Survey

THESE ARE SOME QUESTIONS ABOUT THE SUPPORT THAT IS AVAILABLE TO YOU.

1. About how many close friends and relatives do you have (people you feel at ease with and can talk to about what is on your mind)? Write in the number of close friends and relatives:

☐☐

2. People sometimes look to others for accomplishment, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it? (Check the correct box.)

   a. Someone to help you if you were confined to bed.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1	2	3	4	5
☐	☐	☐	☐	☐

b. Someone you can count on to listen to you when you need to talk.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

c. Someone to give you good advice about a crisis.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

d. Someone to take you to the doctor if you needed it.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

e. Someone who shows you love and affection.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

f. Someone to have a good time with.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

g. Someone to give you information to help you understand a situation.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

h. Someone to confide in or talk to about yourself or your problems.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

i. Someone who hugs you.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

j. Someone to get together with for relaxation.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

k. Someone to prepare your meals if you were unable to do it yourself.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

l. Someone whose advice you really want.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

m. Someone to do things with to help you get your mind off things.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

n. Someone to help with daily chores if you were sick.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

o. Someone to share your most private worries and fears with.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

p. Someone to turn to for suggestions about how to deal with a personal problem.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

q. Someone to do something enjoyable with.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

r. Someone who understands your problems.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

s. Someone to love and make you feel wanted.

None of the time	Little of the time	Some of the time	Most of the time	All of the time
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

3. What is your <u>CURRENT</u> marital status? (check one)

Never married	Presently married	Living in a marriage-like relationship	Divorced or separated	Widowed
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

4. INCLUDING YOURSELF, how many people are NOW living in your home?

☐☐

APPENDIX E

VIRGINIA TECH

Adult Fitness / Rehabilitative Exercise
Thesis Project by Mark T. Ervin -- graduate student

PROCEDURES

Those undergraduate interns selected will assist the principle investigator (Mark Ervin) throughout the study. The following items should be completed in the approximate order by the interns assisting in the study:

1. Ask all new participants entering the phase II program to voluntarily agree to be a subject in an investigative research project by Mark T. Ervin -- a graduate student of Virginia Tech.

2. Briefly explain to the patient that the study is investigating the factors affecting achievement goals in cardiac rehabilitation. A self-administered questionnaire (approximately 10-15 minutes to complete) will be used in the study.

3. If participant agrees to be part of the study, have the individual <u>read</u> and <u>sign</u> the written informed consent form **(VERY IMPORTANT)**! Answer any questions the subject may have regarding the study and/or written informed consent form.

4. After completion of the written informed consent form, have the subject complete the Medical Outcomes Study (MOS) Survey. The participant's Social Security number will be used as patient identification (no names please).

5. Immediately date and initial the completed MOS Survey.

6. Place the completed MOS Survey, a copy of the initial assessment form, written informed consent form, and attendance record in patient's file (manila folder will be provided). Some type of portable file will be provided to keep all participant records separated from those not participating in the study.

7. A calendar will be provided to monitor the subject's attendance over 4 weeks from their first day of exercise in the program. Place patient ID number on calendar.

8. All paper work involved in the study will be mailed back to the principle investigator (Mark Ervin) every week. Postage will be provided by the investigator.

APPENDIX F

INITIAL ASSESSMENT

PATIENT NUMBER________________
SUBJECT NUMBER________________

I. DEMOGRAPHICS

Occupation_______________________
Marital Status S M W D
Sex____ Age__________ Weight_______(lbs) Height__________(inches) Race__________

II. HISTORY

Diagnosis____

Recent Cardiac Event____

Procedures____
____

Medications____
____

III. PRESENT SYMPTOMS (check if applicable and describe)

☐ Chest Pain____
☐ Heart Palpitations____
☐ Skipped Beats____
☐ Dizziness / Lightheadedness____
☐ Edema____
☐ Post OP Discomfort / Problems____
____
☐ Other____
____

IV. PAST MEDICAL HISTORY

Hypertension____ Diabetes______ High Cholesterol______ Lung Disease_________
Kidney Disease________ Back Problems________ Peripheral Vasc. Disease_______
Arthritis_______ Phlebitis______ Cardiac Arrhythmias_________
COMMENTS____
____
____

CONTINUED ON NEXT PAGE

OTHER ILLNESSES / INJURIES____

____

HOSPITALIZATIONS____

____

V. HEALTH PRACTICES

Cardiac Risk Factors____

____

Caffeine Consumption____
Alcohol Consumption____
Tobacco Use____
Exercise / Activity Pattern (recent)______________________________________
(usual)____
Present Stressful Situations____

____

VI. FAMILY HISTORY

____

____

Living Arrangements:____

Risk Stratification According To AACVPR Guidelines
High___ Moderate______ Low__________

VII. EXPECTED OUTCOME

Participant Objectives
1. ____
2. ____
3. ____
4. ____

ADDITIONAL COMMENTS____

____

____

CARDIAC REHAB STAFF/INTERN	DATE

APPENDIX G

MOS RAW DATA

sub. #	sex	sessions	compliance	compliance	MOS score	Male	Marital Status	Female	Marital Status
		out of 12	%	level	total	total		total	
1	M	8	67	M	400	400	M	294	M
2	M	12	100	H	400	400	M	312	W
3	M	11	92	H	233	233	M	261	W
4	M	11	92	H	291	291	M	326	M
5	M	11	92	H	392	392	M	291	W
6	M	9	75	M	400	400	M	400	S
7	M	11	92	H	320	320	M	266	W
8	M	12	100	H	377	377	M		
9	M	12	100	H	351	351	M		
10	M	10	83	M	389	389	M		
11	M	6	50	L	309	309	M		
12	M	5	42	L	134	134	M		
13	M	12	100	H	291	291	M		
14	M	11	92	H	350	350	M		
15	M	10	83	M	400	400	M		
16	M	11	92	H	331	331	D		
17	M	12	100	H	309	309	D		
18	M	1	8	L	312	312	D		
19	M	9	75	M	343	343			
20	M	10	83	M	80	80			
21	M	12	100	H	261	261			
22	M	12	100	H	238	238			
23	F	6	50	L	294				
24	F	11	93	H	312				
25	F	9	75	M	261				
26	F	0	0	L	326				
27	F	0	0	L	291				
28	F	9	75	M	400				
29	F	12	100	H	266				
Avg		9.1	76.2		312.4	314.1		307.1	
SD		3.6	30.1		77	85.2		47	

L= LOW; M= MEDIUM; H= HIGH

APPENDIX H
MOS SUBSCALE RAW DATA

subject #	sex	tangible	affection	positive interaction	emotional
1	M	81	100	92	78
2	M	88	75	67	100
3	M	88	83	75	66
4	M	88	100	75	88
5	M	100	100	67	63
6	M	100	100	100	100
7	M	75	100	100	100
8	M	63	83	50	53
9	M	100	58	58	59
10	M	81	100	100	100
11	M	94	83	67	66
12	M	94	100	92	88
13	M	94	100	100	100
14	M	75	92	83	69
15	M	69	92	75	78
16	M	13	83	67	72
17	M	69	8	25	34
18	M	56	67	50	47
19	M	94	25	25	28
20	M	100	92	92	91
21	M	81	100	92	97
22	M	100	100	75	32
Avg. Score		81.9	83.7	73.9	73.1
23	F	88	67	75	75
24	F	69	75	75	75
25	F	100	67	78	78
26	F	75	42	69	69
27	F	38	100	58	78
28	F	88	75	75	88
29	F	100	100	100	100
Avg. Score		79.7	75.1	75.7	80.4

Table 1. Patient characteristics

Characteristic	Male (%)	Female (%)
	n =22	n =7
MI	16 (73)	6 (86)
CABG	13 (59)	4 (57)
PTCA	7 (32)	1 (14)
PVD	3 (14)	3 (43)
Diabetes	6 (27)	0 (0)
Hypertension	11 (50)	3 (43)
Angina	9 (41)	3 (43)
Smoker	1 (5)	1 (14)
Married	19 (86)	2 (29)
Single	0 (0)	1 (14)
Widowed	0 (0)	4 (57)
Divorced	3 (14)	0 (0)
* Age	61.3	70.4
Blue Collar Worker	8 (36)	0
White Collar Worker	7 (32)	1 (14)
Retired	7 (32)	6 (86)

* There were no statistical significances in the ages of men and women ($p = 0.06$).

Table 2. Comparison of men and women's MOS total scores.

Group	N	Mean	Std Dev	SEM
Male	22	314.1	85.2	18.2
Female	7	307.1	47.0	17.8
Difference		7.0		

Paired t-test (p = 0.83)

Table 3. Distribution of cardiac rehabilitation adherence between men and women.

Subjects	Male	N	Female	N
Low	13.6%	(n = 3)	42.9%	(n =3)
Medium	27.3%	(n = 6)	28.6%	(n = 2)
High	59.1%	(n = 13)	28.5%	(n = 2)

Chi-square; $\chi^2(2) = 3.15$, $p = 0.21$

Table 4. Subject compliance and total MOS scores.

		MOS Scores	
Level of compliance		Mean	SD
Low	6	277.7	71.5
Medium	8	334.1	113.6
High	15	314.8	52.8

Source	DF	SS	MS	F	p
group	2	11101	5550	0.93	0.41
Error	26	154923	5959		
Total	28	166023			

One-Way Analysis of Variance

Table 5. Medical Outcomes Study Conversion Chart

SCORING FORM FOR MOS SOCIAL SUPPORT SURVEY

Tangible		Affection		Positive		Emotional	
Raw	**Conv**	**Raw**	**Conv**	**Raw**	**Conv**	**Raw**	**Conv**
4	0	3	0	3	0	8	0
5	6	4	8	4	8	9	3
6	13	5	17	5	17	10	6
7	19	6	25	6	25	11	9
8	25	7	33	7	33	12	13
9	31	8	42	8	42	13	16
10	38	9	50	9	50	14	19
11	44	10	58	10	58	15	22
12	50	11	67	11	67	16	25
13	56	12	75	12	75	17	28
14	63	13	83	13	83	18	31
15	69	14	92	14	92	19	34
16	75	15	100	15	100	20	38
17	81					21	41
18	88					22	44
19	94					23	47
20	100					24	50
						25	53
						26	56
						27	59
						28	63
						29	66
						30	69
						31	72
						32	75
						33	78
						34	81
						35	84
						36	88
						37	91
						38	94
						39	97
						40	100

Scoring Directions:

Convert the Raw Score into a Conversion Score for each of the four subscales. The MOS score is the sum of the four conversion scores.

SUBSCALES

Tangible Support (4): a, d, k, n
Affection (3): e, i, s
Positive Interaction (3): f, j, q
Emotional Support (8): b, c, g, h, l, o, p, r

Formula Score = (Average Raw Score - 1) x 25
Example = (4+5+4+3)/4 = Average Score of 4 = (4-1) x 25 = 75

Vita

My full name is Mark Todd Ervin. I was born in Chattanooga, Tennessee on December 27,1965. I am the youngest of three children, a brother, 34 years old and a sister, 36 years old. I am the first in my immediate family to attend college and the only one in my entire family to attend graduate school. I come from an average middle class family where my father worked and my mom stayed home with the children. College never seemed important to my brother and sister, probably because they found jobs that seemed to pay well and suit them. It could be that I am the smart one of the family.

When I was 18 years old, I attended Chattanooga State College to study electrical engineering with an emphasis on robotics. I dropped out of college after two years of boredom and went to work for U.S. Pipe & Foundry. I performed several physically demanding jobs before getting into the machine shop. This was where every worker wanted to be because it paid the most and wasn't the filthy, dirty work so commonly seen around the foundry. I worked for two and a half years before getting tired of doing something I despised, despite the great benefits and good pay. I decided to give college one more try while working second shift in the machine shop. I attended two semesters before being laid off work -- permanently. I believe I had some pretty good timing and luck for that to happen. It was then that I started attending college full-time. It just so happened that I made the change from robotics to exercise science, thanks to good advice from Dr. Green at Chattanooga State.

I transferred to UT-Chattanooga in 1990 after completing two years in exercise science at Chattanooga State. I finally graduated from UTC in December of '92 with a B.S. degree in Exercise Science. I became interested in cardiac rehab in my last year as an undergraduate after hearing a lecture on the subject at a SEACSM conference.

After my initial visit to Virginia Tech in March of 1993, I decided to attend the Adult Fitness/Cardiac Rehabilitation and Therapy Graduate Program. Tech and Blacksburg seemed to offer my wife and I all that we were looking for in a college and place to live. From day one of graduate school I grew more interested in cardiac rehab/exercise physiology. And even though cardiac rehabilitation studies kept me busy studying, I still found time to enjoy my other hobbies and interests such as the Boston Celtics, collecting coins, shooting guns, wild life(nature), the ocean, exercising, hiking, wines, new age music and quiet nights with my wife.

Mark T. Erwin