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Perceived Social Support and Exercise Compliance of Phase III Patients in Cardiac Rehabilitation Programs

Rana M. Smith

Eastern Illinois University

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Perceived Social Support and Exercise Compliance of Phase III Patients in Cardiac Rehabilitation Programs

BY

Rana M. Smith

1974

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Science

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY CHARLESTON, ILLINOIS

1999

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING THIS PART OF THE GRADUATE DEGREE CITED ABOVE

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The purpose of this study was to determine if there was a difference in the level of perceived social support from family, friends, and program staff in Phase III patients who comply and patients who do not comply to cardiac rehabilitation programs.

Staff of 22 cardiac rehabilitation programs in ten different states, distributed 10 surveys to compliers and 10 surveys to non-compliers. A three-part questionnaire was designed to gather information regarding demographics, perceived staff social support and perceived family social support. Independent t-tests were used to determine if there were differences in perceived social support between compliers and non-compliers.

Of possible 440 surveys, a total of 193 (44%) were returned, 128 (58%) were compliers who returned the surveys and 65 (30%) of the non-compliers who returned the survey. Independent t-tests showed statistically significant differences (P < 0.05) between compliers and non-compliers in perceived total social support, family social support, and staff social support. Compliers reported a higher level of perceived social support. Compliers also reported a greater frequency and duration of exercise per week outside of the program than non-compliers. In addition to the three days of exercise at the cardiac rehabilitation program site, compliers were exercising an additional three days for about 45 minutes. Non-compliers exercised about two times a week for 25 minutes.

Perceived social support was found to be higher in compliers than non-compliers in cardiac rehabilitation programs.
ACKNOWLEDGEMENTS

I would like to thank Dr. Croisant, Dr. Woodall, and Dr. Owen for all of their time, suggestions, and assistance. I would also like to thank the Adult Fitness Program for monetarily assisting with the materials. Everyone's devotion to assisting with the study was greatly appreciated and will not be forgotten.
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More than 60 million Americans have been diagnosed with cardiovascular diseases, the leading cause of death in the United States. More than 159,000 Americans under the age of 65 die from cardiovascular diseases every year (Cardiac Rehabilitation, 1997; Jeng and Braun, 1997; Tindall, 1998). Treatment of the cardiac patient has undergone many changes since the first description of angina over 200 years ago.

Heberden, a physician in the 1800’s, noticed that a great number of sedentary people developed angina and he suggested physical activity to those with angina. However, Heberden’s philosophy was ignored in the early twentieth century when the nature of angina became apparent (Rucker, 1980).

In 1929, strict bed rest was recommended for six weeks after a myocardial infarction (Bittner and Oberman, 1993; Cardiac Rehabilitation, 1997; Pashkow, 1993; Rucker, 1980). Because of the fear of a ventricular aneurysm, even minimal physical activity, such as self-feeding and dressing was restricted (Bittner and Oberman, 1993). Levine and Lown proposed the chair treatment in 1951. Physical activity continued to be limited, but patients were allowed to sit in a chair for one to two hours a day, starting the first day after a myocardial infarction (Bittner and Oberman, 1993; Harvard Heart Letter, 1997).
Patients with cardiac problems are no longer prescribed bed rest as a prerequisite for recovery. In the past 25 years, there has been a great shift away from encouraging heart patients to stay relatively inactive. Patients are now being encouraged to enter cardiac rehabilitation programs (Hiatt, Hoenshell-Nelson, and Zimmerman, 1990). The idea of early exercise testing and risk factor modification of cardiac patients began to emerge with long-term exercise based rehabilitation programs in the 1980s (Bittner and Oberman, 1993; Gillilan, Beasley, Booth, DeAngelis, Warbasse and Plantholt, 1990; Cardiac Rehabilitation, 1997; Pashkow, 1993).

Healthcare professionals agree that patients need some kind of rehabilitation after a myocardial infarction (Burgess, et al., 1987; Fleury, 1993; Schuster, Wright, and Tomich, 1995). Cardiac rehabilitation is a comprehensive approach to living, surviving, and adapting to lifestyle changes, due to heart disease. It is a multi-dimensional program that includes exercise, education, behavior modification, and social interaction (Fridlund, Hogstedt, Liddell and Larsson, 1991; Hiatt, Hoenshell-Nelson, and Zimmerman, 1990; Holm, Fink, Christman, Reitz, and Ashley, 1985; Pashkow, 1993; Perk, Hedback, and Jutterdal, 1989; Taylor and Berra, 1993). Dr. Mary Ruth Stegman and Dr. Patricia Miller reported that patients who participate in cardiac rehabilitation programs in which prescribed exercise is a major factor, have more efficient cardiovascular functioning, and have a better understanding of their health than do patients who receive routine cardiac care (Stegman, et al., 1987). Patients in cardiac rehabilitation programs have the security of electrocardiogram monitoring during exercise, additional education, and counseling to
assist with behavioral changes necessary to reduce their cardiovascular risk factors (Gillilan, et al., 1990; Schuster, Wright, and Tomich, 1995).

Adequate compliance is extremely important in achieving optimal benefits of cardiac rehabilitation (Digenio, Padayachee, and Groeneveld, 1992). Cardiac rehabilitation’s goal is to return the patient to the functioning he/she had before the cardiac event (Derenowski-Fleury, 1991; Fleury, Kimbrell, and Kruszewski, 1995). The programs are susceptible to non-adherence, which will limit the benefits of the programs (Fielding, 1989; Friedman, Williams and Levine, 1997; Hoepfel-Harris, 1980). Neil Oldridge (1988) describes compliance as the extent to which a person’s behavior coincides with the medical or health advice given to them.

Social support has been found to have an effect on the cardiac patient’s outlook and well being (Oka, King, and Young, 1995). Social support comes in many forms, such as, love, respect, trust, financial assistance, physical assistance, and encouragement (Bramwell, 1990). Social support is theorized to operate with specific mechanisms, including supplying praise and encouragement, allowing participation in decision making, use of behavior modification techniques, sharing of tasks, expression of feelings and personal concerns, listening, and social participation (Bramwell, 1990; Derenowski-Fleury, 1991; Doeglas, et al., 1996; Fleury, 1993; Hilbert, 1985; Oka, King, and Young, 1995; Salisbury, 1994; Sarason, Levine, Basham, and Sarason, 1983). Support can come from family, friends, and health-care professionals. The bigger the cardiac problem or crisis, the greater the need for social support. Insufficient support may cause inefficient
coping strategies (Dunnington, & Finkelmeier, 1988). Having adequate social support may influence the patient’s attitude towards recovery and compliance to the exercise regimen prescribed.

Need for the Study

There have been studies on factors influencing exercise adherence in cardiac rehabilitation programs, but few have focused on social support as a crucial factor. Studies show that social support has increased the patients’ physical and mental well being following a cardiac event (Flaherty, Gaviria and Pathak, 1983; Fontana, Kernes, Rosenberg and Colonese, 1989; Moser, 1994; Waltz, 1986). The outcome that social support has had on self-esteem and well being, indicate that it may also affect the patient’s compliance to a rehabilitative exercise program.

Purpose of the Study

The purpose of this study was to determine if there was a difference in the level of perceived social support from family members, friends, and medical staff of Phase III patients who comply and do not comply in cardiac rehabilitation programs.
Hypothesis

Phase III patients who comply with their cardiac rehabilitation program perceive a higher level of social support from family, friends, and program staff than do patients who are non-compliant.

Scope of the Study

The study utilized Phase III patients in twenty-two cardiac rehabilitation programs from ten different states.

Limitations of the Study

There were three major limitations of the study. The patient measures perceived social support subjectively. Social support has to do with feelings that are intangible. More compliers returned data sheets than non-compliers. Subjects were not able to be randomly selected.

Definition of Terms

Social Support: Social support comes in many forms, such as love, respect, trust, financial assistance and encouragement. It is companionship, giving information and helping another person move toward a desired goal by family, friends, and medical staff (Bramwell, 1990; Derenowski-
<table>
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<th>Following and continuing with the exercise program as it was prescribed (Oldridge, 1988).</th>
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<td><strong>Patient Compliance:</strong></td>
<td>Following the physician’s suggestions for treatment. In this study, patient compliance was considered attending at least 75 percent of the cardiac rehabilitation sessions. Non-compliers were categorized as those who attended cardiac rehabilitation less than 25 percent of the sessions (Oldridge, 1988).</td>
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<td><strong>Cardiac Disease:</strong></td>
<td>Refers to health problems of the heart; including myocardial infarction (MI), atherosclerosis, coronary artery by-pass surgery (CABG), percutaneous transluminal coronary angioplasty (PTCA), and congestive heart failure (Austrin and Austrin, 1991).</td>
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<td><strong>Cardiac Risk:</strong></td>
<td>Overall risk of developing heart disease. Typical risk factors include: diabetes, high blood pressure, prior heart attack, high cholesterol, inactivity, smoking and a family history for heart attacks in parents or siblings (Bryant, Mahler, Froelicher, Miller, and York, 1995).</td>
</tr>
<tr>
<td><strong>Myocardial Infarction:</strong></td>
<td>Heart attack (Costello, and Posner, 1991).</td>
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Cardiac Rehabilitation: A risk factor modification program, along with an exercise program for people with heart disease. There are four phases. Phase I, an inpatient program that focuses on range of motion exercises activities of daily living, risk factor modification. Phase II is a monitored exercise program, along with risk factor modification that meets three times per week for 8-12 weeks. Phase III is a continuance of phase II, but the patient is no longer ECG monitored during exercise. Phase IV usually does not take place in a rehabilitative setting and has minimal supervision (Perk, Hedback and Jutterdal, 1989; Pollock and Wilmore, 1990; Salisbury, 1994; Thompson, Bowman, Kitson, deBono, and Hopkins, 1996).
CHAPTER II
REVIEW OF LITERATURE

This chapter reviews the literature related to exercise compliance and social support in cardiac rehabilitation programs. The first section of the chapter discusses compliance in regard to cardiac rehabilitation. The second section focuses on the aspect of social support. The final section looks at social support in conjunction with compliance in cardiac rehabilitation programs.

Exercise Compliance

Factors that are important in motivating cardiac patients to start and continue with an exercise program are still unclear (Holm, Fink, Christman, Reitz, and Ashley, 1985). Adherence can easily be measured in structured exercise programs, such as cardiac rehabilitation programs, by using the patient’s charts to check progress and adherence (Emery, 1995). A cardiac patient is considered compliant in cardiac rehabilitation if the mode, frequency, intensity, and duration of exercise is set at the correct level for the capability of the patient (Ice, 1985). In cardiac rehabilitation programs, adherence is determined by the proportion of patients achieving the goals within a given time frame, and by the extent to which each patient maintains and attends the sessions over time (Emery, 1995). The major factors that determine the success of a cardiac rehabilitation program are exercise intensity and compliance rates (Jeng and Braun, 1997).
Most adult fitness programs have adherence rates of 40 to 65 percent during the first year (Carron, Hausenblas and Mack, 1996; Charlton, 1993; Digenio, Padayachee, and Groeneveld, 1992; Duncan and McAuley, 1993; Ice, 1985). Dr. Oldridge (1988) presents evidence that there is decreasing compliance over time. The Ontario Exercise-Heart collaborative study showed an overall three-year dropout rate of 46.5 percent (Oldridge, et. al., 1983). Karen Radtke’s (1989) results showed that post myocardial infarction patients comply with exercise programs early in recovery, but over time, compliance diminishes. Data suggests that only two percent of cardiac patients who did not participate in a cardiac rehabilitation program were still exercising regularly six to nine years after the event. However, 19 percent of cardiac rehabilitation patients were still regularly involved in heavy exercise six to nine years later (Oldridge, 1988).

Digenio, Padayachee and Groeneveld (1992) used 711 patients from Johannesburg Cardiac Rehabilitation Center. The number of dropouts increased gradually over 24 months. Thirty-six percent of patients dropped out by 12 months and only 50 percent of the patients completed the 18-month program. Carmody et al., (1980) found that of the 203 cardiac patients that they followed for 40 months, only 38 patients were still participating. It has been found that 50 percent of patients starting an exercise program after a myocardial infarction become non-compliers within the first twelve months (Ice, 1985; Mirotznik, et al., 1995; Oldridge, 1988). About half of patients with heart disease do not comply with exercise, nutrition or smoking recommendations one year after the event (Maes, 1992). Ralph LaForge (1997) determined in his study that only 25 percent
of heart patients were still compliant one year after beginning cardiac rehabilitation. Hellman (1997) approximates that only 29 percent of people in the United States, age 65 and older exercise regularly, and often, physical activity continues to decrease with age.

Strategies for improving compliance include reinforcement, cognitive strategies, flexible program hours, increased feedback on progress, and additional meetings that focus on the concerns of the patient, including the spouse and family (Ice, 1985). Adherence strategies that may be implemented into programs include assessment of educational status to determine the program education level for ease of patient understanding, assessment to determine patients who may be at risk for dropping out due to depression or anxiety, determining the patient’s previous exercise history, as well as other health behavior changes, determining the patient’s goals and comparing them to the goals of the rehabilitation program, providing a variety of educational material early in the program and encouraging the patient to make health behavior changes in small steps (Emery, 1995).

If a patient perceives a myocardial infarction as unpreventable, attending a cardiac rehabilitation program, in his eyes, is useless, causing poor attendance (Fielding, 1989). Oldridge (1988) indicates in his analysis of exercise compliance and exercise dropouts that the dropouts were more likely to have a repeat myocardial infarction than were compliers. A meta-analysis of trials suggests that with compliance to a cardiac rehabilitation program there is a potential of overall mortality reduction of 20 percent (Thompson, Bowman, Kitson, deBono, and Hopkins, 1996). Braun (1997) found that
patients with high compliance rates reported less anxiety, depression and an overall better feeling of health and quality of life. Rucker (1980) found that encouraging spouses to join the exercise program, having patients lead the warm-up, and periodically performing treadmill tests to show improvements has enhanced compliance with long-term rehabilitation.

Dr. Hertanu’s et al., (1986) study consisted of 40 patients, 35 to 77 years old. Six months and two years after completing the three-month cardiac rehabilitation exercise program, follow-ups determined that 57 percent continued to do some mode of cardiovascular exercise regularly. It is important to determine factors that can influence exercise behavior in order to assist patients in receiving the benefits of cardiac rehabilitation (Jeng and Braun, 1997). Patients participating in cardiac rehabilitation programs have 20 to 25 percent decrease in heart related deaths (Franklin, 1996). Cardiac patients who comply with cardiac rehabilitation programs will have improved physical fitness, less fear and anxiety with more self-confidence, and presumably lower infarction and mortality rates than non-compliers (Ice, 1985). The physiologic characteristics of exercise dropouts suggest that they represent a population that may need the benefits of an exercise program the most (Blumenthal, Williams, Wallace, Williams and Needles, 1982).
Social Support

Social support has been found to influence cardiovascular health behavior (Derenowski-Fleury, 1991). One of the important factors in helping with recovery from a cardiac event is social support (Yates, 1995). Helen Goodman’s (1997) study shows that the support patients need falls into three categories: the need to have a link with the hospital, need for support from other patients, and the need for companionship. There is a difference between personal and professional social support. Support received from medical personnel ends when the professional service is no longer required. Family support is ongoing and is very important in recovery (Bramwell, 1990).

Patients recovering from a cardiac event who reported high amounts of social support have had greater self-esteem, better adjustment, less severe cardiac symptoms, and decreased levels of depression (Carron, Hausenblas and Mack, 1996; Cardiac Rehabilitation, 1997; Hertanu, Davis, Focseneanu and Lahman, 1986; Moser, 1994; Salisbury, 1994; Sirles and Selleck, 1989; Tindall, 1998). Another study also found that having adequate social support decreased the development of depression after a cardiac event (Flaherty, Gaviria and Pathak, 1983). Dr. Oldridge and colleagues (1983) found that the supportive nature of group interaction, along with lifestyle modification, minimizes the severity of complications after a myocardial infarction. Social support has also been linked with the reduction of psychological distress, fewer complaints of dyspnea, and a reduced fear of having another cardiac event (Moser, 1994). Trelawny and Russell’s (1987) study consisted of 32 married men under the age of 65, who had a
suspected myocardial infarction. Thirty-one of the men survived for the 6-month study. Thirty-three percent suffered from moderate to severe anxiety and 26 percent from depression. Most of these men said that they would have liked encouragement and support (1987).

The recovery process is encouraged through helping patients identify and access needed support (Fleury, Kimbrell, and Kruszewski, 1995). Social support contributes to positive adjustment and personal development and provides a buffer against the effects of stress (Sarason, Levine, Basham, and Sarason, 1983; Sirles and Selleck, 1989). Yates’ (1989) study was designed to look at the relationship between illness-related stress and supportive and non-supportive behaviors for the cardiac patient and spouse. The sample included 264 patients and spouses. The results concluded that increased support from the spouse was related to decreased stressed levels of the patient, and non-supportive gestures from medical personnel were associated with greater stress for the patient and the spouse. Partner support was the strongest correlation of well being for patients and their partners (Yates, 1989).

A major cause of happiness and life satisfaction was determined by national surveys taken in many countries. The survey determined that the main cause of happiness was having a spouse and being satisfied with the relationship (Waltz, 1986). Debra Moser (1994) found that there was a strong relationship between the lack of social support and increased mortality, even after controlling for other possible causes of mortality. Low social support scores were found to be a predictor of cardiovascular
mortality in people with known cardiovascular disease as well as the apparently healthy (Christopherson-Yates, Skaggs, and Parker, 1994). Millard Waltz's (1986) investigation of 600 cardiac patients and their spouses revealed that social support is strongly linked with positive and negative characteristics of the relationship with the spouse. Patients who were close to their spouse were satisfied with the amount of support received. Those who had conflicts with their spouse reported inadequate social support. Individuals lacking intimacy have emotional needs that are less likely to be met than individuals who have an intimate relationship. Those lacking adequate companionships are viewed as having poorer mental health and less social outlets and have trouble coping with stressful situations (Waltz, 1986). The study performed by Fontana, Kernes, Rosenberg and Colonese (1989) determined that intimate relationships decreased the fear of a repeat cardiac event, decreased stress, and reduced cardiac symptoms. The level of closeness in relationships appears to differ greatly in happy and unhappy individuals, it is thought that the same is true of healthy and unhealthy individuals (Waltz, 1986). Hoffman et al., (1995) performed a study to identify psychosocial variables that determine the long-term outcome after a myocardial infarction. Data was taken from hospital charts, questionnaires filled out by the patients when entering the rehabilitation program and a follow-up questionnaire sent one year later. They found a significant correlation between a poor medical outcome and a lack of stable partnership (Hoffmann, Pfiffner, Hornung, and Niederhauser, 1995). The occurrence of stressful events in life is associated with more problems, such as psychiatric disorders, in those living alone or unmarried than
those who are married or living with others (Sarason, Levine, Basham, and Sarason, 1983). Social isolation, lack of personal relationships, and living alone is associated with a two-fold increase of death due to heart disease (Sullivan and Sullivan, 1997; Taylor and Berra, 1993). Dhooper (1984) found that right after a myocardial infarction, social support was needed and provided. But within one month after the patient’s discharge, this support was no longer available, although it was still needed.

The family’s belief about the cause or the extent of an illness, will establish the patient’s emotional and physical responses. The responses to the illness by the family, greatly influence the patient’s recovery (Dickerson, 1998; Sirles and Selleck, 1989; Thompson et. al., 1996; Yates, Skaggs, and Parker, 1994). Family plays an important role in dealing with the illness and assisting in encouraging the patients to seek out available information and care, such as cardiac rehabilitation (Sirles and Selleck, 1989). The spouse is the primary source of support for patients who are recovering from a cardiac event (Dickerson, 1998; Yates, Skaggs, and Parker, 1994). It has been determined that the families are the major source of support and it is important for the spouse to provide encouragement and support after a cardiac event (Miller, Wikoff, McMahon, Garrett, and Ringel, 1990; Moser, 1994; Sirles and Selleck, 1989). Fridlund, Hogstedt, Liddell and Larsson’s study (1991) included 178 patients of which 87 were randomly placed in the intervention group and 91 in the control group. Nineteen patients died within the first five weeks. Four more patients died before the one-year follow-up. The results concluded that family support was very important for enhancing recovery.
Also, the study determined that a repeat myocardial infarction was significantly lower 12 months after the myocardial infarction inpatients in the intervention group (Fridlund, Hogstedt, Liddell and Larsson, 1991). Spouse support helps improve the patient’s emotional adaptations and acceptance of his/her life being meaningful even though he/she has a cardiovascular disease (Christopherson-Yates, Skaggs, and Parker, 1994).

Social support is often thought to occur only between close family and friends. The most important social contacts are the people closest to the patients, but these are not the only relationships that offer valuable sources of support (Carron, Hausenblas and Mack, 1996; Milne and Netherwood, 1997). Close relationships are important to patients recovering from a cardiac event. Health care professionals can provide support as well. The medical staff may be the ones to provide the needed support to those patients who are alone (Bramwell, 1990; Moser, 1994; Sirles and Selleck, 1989). Physicians and other healthcare professionals are an important source of support and provide support that family members do not (Sirles and Selleck, 1989). Debra Moser, R.N., believes that health care professionals have an important role in providing social support. They can provide support by encouraging patients to participate in activities, such as cardiac support groups for patients and family, risk factor modification classes as well as other social activities (1994). Winefield and Katsikitis’s (1987) study included 78 patients, 161 family members, 71 doctors and 27 other health care professionals. Sixty-nine percent of the patients thought that their doctor provided support and assistance during recovery.
The majority of health care professionals believed that they play an important role in the support after surgery.

Gravelle, Pare and Laurencelle's study (1997) included 118 senior citizens in an adult fitness program. The results from the questionnaire determined that if the individuals thought the program was beneficial and good, they were more likely to comply. Family support seemed to contribute a minute amount of motivation for the individual to continue exercise. Bar-Eli's study (1996) used six questionnaires to determine the extent of external influences on exercise compliance. He found no significant differences between compliers and non-compliers. The difference that he found was that compliers were more intrinsically satisfied than non-compliers. Social support had no effect in his study.

Patients who have heart disease need support to keep healthy lifestyle habits for life. Encouragement is needed by medical staff and family (Verrill, Bergey, McElveen and Witt, 1993). Discouragement from spouse and family members, lack of friends' involvement, and lack of physician encouragement make complying to an exercise program difficult for the older adult (Ribisle and Shumaker, 1998). Christopherson-Yates and her colleagues (1994) report that even though clinical experience suggests that social support is an important factor in the rehabilitation of cardiac patients, there is little known about the support from various sources who assist with health promotion. The positive effect of social support and the ease of implementing social support strategies
signify that it should play an important part in the recovery process of a patient from a cardiac event (Moser, 1994).

**Social Support and Exercise Compliance**

Adherence to exercise programs of cardiac patients is predicted by amounts of social support received (Bar-Eli, 1996; Oka, King, and Young, 1995). The results of Carron, Hausenblas and Mack’s meta-analysis (1996) concluded that social support has a positive affect on exercise compliance. It is important for spouses to support the patients in the necessary lifestyle changes and can assist by making these lifestyle changes for themselves as well (Dracup, Meleis, Baker and Edlefsen, 1984). A family can help produce positive and negative attitudes in the patient. It has been found that there is a strong positive relationship between social support and compliance (Holm, et al., 1985; Oka, King, and Young, 1995). Ice (1985) discovered that patients whose spouses supported their exercise practices were twice as likely to comply with a program than those whose spouses did not support their exercise habit. Hiatt, Zimmerman and Hoenshell-Nelson (1990) found that married patients perceived more benefits and fewer barriers to participating in a cardiac rehabilitation program than single or widowed patients.

In the study conducted by Dr. Holm et al., (1985), 53.8 percent of the cardiac patients said that their spouse was the most influential person in their lives. They also found that patients who thought they were likely to have another cardiac event were more
willing to comply. Dr. Holm's study also indicated that the subjects were satisfied with their exercise program and staff. However, she pointed out that the high satisfaction ratings could be due to fear of jeopardizing their relationship with the cardiac rehabilitation staff (Holm, et al., 1985). Jean Hoepfel-Harris (1993) believes that compliance depends on the sincerity and enthusiasm of the cardiac rehabilitation staff.

In the Ontario Exercise-Heart collaborative study, exercise intensity did not play a role in exercise compliance but dropouts were greatly influenced by the lack of spouse support, inconvenience, or by an uninterested staff (Oldridge, et al., 1983). Patients' attitudes toward received medical advice have been highly valuable predictors of exercise adherence. It was found that patients who were widowed were at a greater risk for a repeat myocardial infarction (Stegman, Miller, Hangman, Kirby, Kositzky-Klutman, and Rajek, 1987). Encouragement, advice and assistance have all been noted to assist with positive outcomes for individuals participating in exercise (Duncan and McAuley, 1993). Medical or spouse support have proven to be important for compliance in rehabilitation programs (Emery, 1995). The purpose of Duncan and McAuley's study (1993) was to determine relationships between self-motivation, social support and exercise compliance. It was found that social support indirectly influenced exercise behaviors. They determined that self-motivation and confidence plays an important role in the effects that social support has on exercise adherence (Duncan and McAuley, 1993). Fleury's study (1993) had 24 cardiac rehabilitation patients as subjects. Ages of the subjects ranged from 38 to 79 years. Data collection took place during a seven-month period. The results
showed that social support increased self-esteem and feelings of self-worth. In turn social support also was a motivator to continue with cardiac rehabilitation (Fleury, 1993). Meagher, Gregor and Stewart (1987) found that in Canada and the United States, social support during recovery of a cardiac event is very important to the patient, as well as the family.

Richard Fielding found in his study that non-compliers denied their problems and complying with the program regiment would make it more difficult to deny their health status (1989). The purpose of Dr. Blumenthal and his colleagues’ study was to provide an assessment of physical and psychological factors of patients beginning in cardiac rehabilitation programs, in order to determine if specific characteristics can predict exercise compliers and dropouts. Twenty-six percent of the 35 patients dropped out within the first six months and within one year 40% had dropped out. Patients who remained in the program had a daily walking distance slightly higher than those who dropped out. The results suggest that the dropouts were defensive and in more emotional distress than those who adhered to the exercise program. At the beginning of the program, the dropouts were found to be more concerned about health, more depressed, more anxious, and socially isolated (Blumenthal, Williams, Wallace, Williams, and Needles, 1982). The purpose of Karyl Burns and colleagues’ (1998) study was to determine if cardiac patient self-motivation and confidence would be positively related to exercise compliance and can be predicted from patient characteristics. She found that those who have little physical activity before their incident have less confidence in
participating in an exercise program. These patients will be at risk for dropping out of
cardiac rehabilitation without encouragement and support (Burns, Camaione, Froman,
and Clark, 1998).

Gail Hilbert’s (1985) study contrasted all of the other studies in that it did not
support the idea that social support influenced exercise compliance. The Pearson
correlation coefficient between support and compliance was –0.56. The reason given for
the non-significant results included that the behaviors described in the support scale
didn’t coincide with the patient’s marital interaction style. Conn, Taylor, and Abele’s
study (1991) included 197 adults aged 40 years and older. The subjects were asked the
number of days of decreased activity due to health. Anxiety, depression, social support,
self-esteem, quality of life and adherence were all measured by various questionnaires.
Low social support scores were associated with increased age. There was no significant
relationship between support and adherence (Conn, Taylor, and Abele, 1991).
It has also been reported that social isolation or lacks of companionship have been
reported to be the main causes of rehabilitation dropouts (Holm, et al., 1985). Social
support has been associated with positive outcomes in cardiac rehabilitation patients.
Social support is linked with increased resistance to coronary artery disease, decreased
incidence of angina, and compliance to the rehabilitation program (Bramwell, 1990).
Social support has been consistently linked with compliance to cardiovascular health
behaviors, such as physical activity, dietary modification and smoking cessation
(Derenowski-Fleury, 1991). Social support has shown importance in influencing
compliance to exercise. The positive outcomes of cardiac rehabilitation will only occur in compliant patients (Mirotznik, Jerrold, Feldman, Leah, Stein, and Richard, 1995). Important educational information and social support can be achieved through an effective cardiac rehabilitation program (Gillilan, et al., 1990).

Summary

Exercise has been connected to improvements of cardiovascular functioning. Reports of the outcomes of exercise training in compliant patients have been positive (Holm, et al., 1985). The problem is poor compliance among cardiac patients.
The study used a survey to determine perceived social support from cardiac rehabilitation staff and family/friends in Phase III cardiac rehabilitation patients.

Sampling Procedures

Patients involved in cardiac rehabilitation programs in the United States were eligible for this study. A sample of twenty-five cardiac rehabilitation programs in the United States was selected. These programs were selected because former Eastern Illinois University students worked in these cardiac rehabilitation departments and would be more willing to cooperate with the study. The states that were included in the study were Florida, Illinois, Indiana, Kansas, Michigan, Missouri, North Carolina, Oklahoma, Pennsylvania, and Wisconsin. Programs that received surveys are listed in Appendix A. A total of 500 surveys were mailed to the cardiac rehabilitation programs on March 20, 1999. Each program received 20 surveys to send out to patients, ten yellow and ten white. The colors were used for group determination of a complier or non-complier for the statistical analysis. The staff of the program received a letter explaining the procedure (Appendix B). The staff of each cardiac rehabilitation program was asked to disperse 10 yellow surveys to ten Phase III patients who attended less than twenty-five
percent of the sessions, and to disperse ten white surveys to ten Phase III patients who attended seventy-five percent or more of the sessions. It was asked that the participants return their surveys in the by May 10, 1999, with the enclosed self-addressed stamped envelope.

Each survey was accompanied by a cover letter (Appendix C) explaining the study, along with a stamped, self-addressed, return envelope.

**Survey**

The questionnaire (Appendix D) asks nine demographic questions, seven questions pertaining to perceived social support from family members/friends and seven questions regarding support from the cardiac rehabilitation staff. The nine demographic questions were regarding mode, frequency, and duration of exercise, health, age, and year started cardiac rehabilitation. These nine questions were derived from the Standardized Adherence Questionnaire developed by Oldridge and Steiner (1990). The social support questions were completion and multiple choice. These questions were answered on a six-point Likert scale, with a score of six representing the highest amount of support. The social support questions were modified from the Multi-Dimensional Support Scale (Winefield, Winefield, and Tiggeman, 1992).

The following questions were asked regarding the patient’s perceived social support from cardiac rehabilitation staff and from family/friends:

- Did they listen to you when you talked about your concerns?
Did you feel that they were really trying to understand you?
Did they answer your questions or give advice about your concerns?
Did they stress the importance of staying involved in cardiac rehabilitation?
The next three questions were asked in the section regarding the perceived support from the staff:
Did they encourage you to get involved in activities?
Did they fulfill their responsibilities towards you in helpful practical ways?
Did you have to wait a long time during a session before getting personal attention?
The following three questions were included in the section regarding support from family/friends:
Did they encourage you to attend cardiac rehabilitation sessions?
Did they offer you assistance?
Does my spouse/family/friends approve of my participation in the cardiac rehabilitation program?

**Scoring**

The responses of each patient to the seven questions about support from family and friends were totaled to give a family social support score. A score of 35 to 42 represents adequate social support, a score of 23 to 34 signifies some social support, and a score of 22 or less represents an inadequate amount of support. The family and staff
support scores were combined to give a total social support score. Adequate total social support was represented by a score of 70 to 84, some social support was represented by a score of 46 to 69, and an inadequate amount of total social support was demonstrated by a score of 44 or less (Winefield, Winefield, and Tiggeman, 1992).

Statistical Analysis

The surveys were divided into two groups, compliers and non-compliers. Frequency counts for various demographic data were obtained. Demographic information that was collected included gender, age, amount of time in cardiac rehabilitation, and the type of cardiac problem.

Data was analyzed using independent t-tests. The t-tests determined the difference in perceived social support for compliers and non-compliers.

Independent t-tests were also used to test for significant differences in exercise frequency and duration outside of the cardiac rehabilitation program per week, between the two groups.
CHAPTER IV
RESULTS

Survey Response Rate

Staff of twenty-five cardiac rehabilitation programs each received twenty surveys to give to compliers and non-compliers in their Phase III cardiac rehabilitation programs. One program was not able to get institutional consent and two programs no longer had Phase III cardiac rehabilitation programs, thus 440 phase III patients received surveys. A total of 193 (44 percent) surveys were returned. Of the possible 220 compliers, 128 (58 percent) returned a completed survey, while only 65 (30 percent) of the 220 non-compliers returned a survey.

Demographic Data

Numbers of males and females, age group, the date cardiac rehabilitation was started and the types of heart problems that were represented in the complier and non-complier groups were also obtained from the surveys.

The complier and non-complier groups had a similar proportion of men and women. The compliers and non-compliers consisted of more men than women. In the complier group there were 86 men (68 percent), 41 women (32 percent), and one who did not report gender. The non-compliers had a similar man to woman ratio. The non-compliers had 45 men (69 percent) and 20 women (31 percent).
The comparison of the age breakdown between compliers and non-compliers can be seen in Figure 1. There was a slightly higher percentage of patients in their seventies in the complier group and a higher percentage of patients in their fifties in the non-complier group.

Figure 2 shows the differences in the cardiopulmonary problems present in the compliers and non-compliers. The compliers reported a higher incidence of heart procedures, such as PTCA and CABG, than non-compliers. But the compliers reported a lower number of myocardial infarctions than the non-compliers. Subjects could list multiple cardiopulmonary problems.

Computation of Support Scores

The response of each patient to the seven questions about support from family and friends were totaled to give a family social support score. Likewise responses to the seven questions about support from the cardiac rehabilitation staff was added to give a staff social support score. The family and staff support scores were combined to give a total social support score. Figure 3 shows the total, family, and staff support scores for both the compliers and non-compliers.
Figure 1 Comparison of Ages in Compliers and Non-compliers
Figure 2 Percent of Cardiopulmonary Problems in Compliers and Non-compliers
Figure 3  Social Support Scores of Compliers and Non-compliers
Family Social Support

To determine the difference in the amount of perceived family social support received, an independent t-test was used. There was a statistically significant difference in the amount of perceived family social support between compliers and non-compliers. The highest possible score for family support was 42. The compliers felt that they had more support from family than the non-compliers, with a mean difference of 4.6. The mean score, standard deviation (S.D.) and probability of family support in compliers and non-compliers can be seen in Table 1.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers (n=128)</td>
<td>35.6</td>
<td>6.8</td>
<td>4.10</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Non-compliers (n=65)</td>
<td>31.0</td>
<td>8.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Staff Social Support

An independent t-test was also used to determine the difference of perceived staff social support between compliers and non-compliers. The compliers and non-compliers
both fell in the adequate support category. The patients who complied to the cardiac rehabilitation program reported more social support than non-compliers. There was a significant difference in the amount of social support received by compliers and non-compliers. The mean difference between the compliers and non-compliers was 3.2. The mean score, standard deviation, t-value, and the probability can be seen in Table 2.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers (n=128)</td>
<td>38.3</td>
<td>4.2</td>
<td>3.91</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Non-Compliers (n=65)</td>
<td>35.1</td>
<td>7.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Social Support

An independent t-test was used to determine the difference of total support between the compliers and non-compliers. There was a significant difference between the two groups. The compliers had a higher perceived social support from staff and family combined. The total score possible was 84. The mean difference between the compliers and the non-compliers was 7.9. Table 3 displays the mean, standard deviation (S.D.), t value, and probability.
Table 3

Independent t-test for Total Social Support in Compliers and Non-Compliers

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers</td>
<td>73.9</td>
<td>9.6</td>
<td>4.85</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>(n=128)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-compliers</td>
<td>66.0</td>
<td>12.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gender Differences in Perceived Social Support

Independent t-tests were used to distinguish differences in perception of social support in men and women. There were no significant differences of perceived family/friend social support between men and women. Table 4 shows the results of the independent t-test of family support.

Table 4

Independent t-test for Gender differences in Perceived Family Support

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>34.5</td>
<td>7.4</td>
<td>1.21</td>
<td>.229</td>
</tr>
<tr>
<td>(n=131)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>33.0</td>
<td>8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=61)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There were no significant differences in staff support between men and women. Table 5 shows the independent t-test results for perceived staff social support scores in men and women.

### Table 5

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>S. D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>37.1</td>
<td>5.8</td>
<td>-.45</td>
<td>.653</td>
</tr>
<tr>
<td>(n=131)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>37.4</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=61)</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Exercise Frequency and Duration**

The mean, standard deviation and variance were determined for the frequency and duration that the compliers and non-compliers exercised on their own per week. The compliers exercised on their own more frequently, for a longer duration than the non-compliers. Independent t-tests were used to compare the frequency of exercise in compliers and non-compliers. The compliers significantly exercised more frequently outside of the program than non-compliers, with a mean difference of .9 days. Table 6 shows the independent t-test for exercise frequency in compliers and non-compliers.
An independent t-test was used to determine the difference in the duration that compliers and non-compliers exercised on their own. Compliers exercised for a significantly longer amount of time outside of the program than non-compliers, with a mean difference of 19.8 minutes. Table 7 shows the results of the independent t-test for duration of exercise.

Table 6

Independent t-test for Exercise Frequency per week in Compliers and Non-Compliers

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers (n=128)</td>
<td>2.8</td>
<td>1.8</td>
<td>3.4</td>
<td>.001</td>
</tr>
<tr>
<td>Non-Compliers (n=65)</td>
<td>1.9</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7

Independent t-test for Exercise Duration on own in Compliers and Non-Compliers

<table>
<thead>
<tr>
<th></th>
<th>Mean (min)</th>
<th>S.D.</th>
<th>t Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers (n=128)</td>
<td>44.7</td>
<td>30.4</td>
<td>4.37</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Non-Compliers (n=65)</td>
<td>25.0</td>
<td>28.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER V

SUMMARY AND DISCUSSION

The purpose of the study was to determine if there was a difference between compliers and non-compliers in perceived social support from family members, friends and medical staff in cardiac rehabilitation programs. Four hundred forty surveys were received from 22 cardiac rehabilitation programs, and 193 were returned. Compliers returned 128 surveys and non-compliers returned 65 surveys. Independent t-tests showed statistically significant differences \( (P < .05) \) in the amount of perceived total, family/friends, and staff social support, as well as duration and frequency of exercise on their own, between compliers and non-compliers. Compliers reported a higher amount of social support. Compliers also had increased frequency and duration of exercise outside of the rehabilitation program. The compliers were older than the non-compliers and 67 percent of respondents were men and 32 percent were women in both groups.

Discussion

The main finding of the present study was that patients who complied with cardiac rehabilitation programs reported higher family and cardiac rehabilitation staff support than those who were non-compliers. These patients may comply because of the social support that they receive. Having more social support, means that they have...
more encouragement to participate and continue attending the exercise sessions. However, those who do not comply, may not have the attention and encouragement they need to have for them to become compliers. Williams and Lord (1995) suggested that the exercise experience could be made easier by having social support. Family, friends, and program staff can contribute to the patient's exercise adherence through support and encouragement. It has been determined that the spouse's attitude toward cardiac rehabilitation involvement is more important than the patient's attitude when it comes to participation and attendance (Dishman, 1985, Franklin, 1986). Therefore, if the spouse does not support and encourage cardiac rehabilitation, the patient is not going to have a good attendance record, because of the low amount of social support. Martin and Dubbert (1982) found that patients with spousal support are twice as likely to have good adherence rates than the patients whose spouses had a neutral or negative attitude towards the cardiac rehabilitation program. McMahon et al., (1986) and Miller (1988) demonstrated the effect that family members and patients' attitudes and beliefs have on patient compliance.

Cardiac rehabilitation has many beneficial effects for those patients who comply with the program. Shepard et al., (1981) illustrates a five-fold difference in fatal and non-fatal repeat incidences of a myocardial infarction from those who adhered to a cardiac rehabilitation program. The results showed that patients who participated in a program had a much better chance of surviving a repeat heart attack.

In this study age may be a factor in compliance. The compliers were older than the non-compliers. The compliers consisted of 17.2 percent of subjects in their fifties
and 27.7 percent of the non-compliers were in their fifties. Subjects in their seventies made up 40 percent of the compliers and 32 percent of the non-compliers. The compliers may have been older because they are retired and have more time to attend the cardiac rehabilitation program. Also, possibilities for the younger non-compliers, is denial of their problems. Richard Fielding (1989) found in his study that non-compliers denied their heart problems and by complying with a cardiac rehabilitation they would no longer be able to deny their health problems. Another possible reason for the non-compliance could be due to their professional workload and the distance from the program.

There were more men than women in both the complier and non-complier groups. This could be because heart disease has until recently been considered a man’s disease. Although 40 percent of all coronary events occur in women, only 20 to 30 percent of patients entering cardiac rehabilitation programs are women. Female coronary patients are less likely to be referred to cardiac rehabilitation by their physicians than men, because of less aggressive treatments (Con, Linden, Thompson, and Ignaszewski, 1999). Women live longer than men, and on an average develop heart disease ten years later than men. Mortality rates in women are higher than men, and women need to have a more aggressive approach to treatment than given (Con, Linden, Thompson, and Ignaszewski, 1999). Mortality rates in women may be decreased if more are referred to cardiac rehabilitation for recovery.

In this study there were no differences in the amount of perceived social support when considering gender. Con et al., (1999) found that men who reported less
social support, felt more functionally impaired. They also suggested that men need more support and looking after than women. If men do not have adequate social support, they have more difficulty returning to their normal activities. Men who had lower levels of pain and low depressive symptoms report high levels of social support. Men reported lower amounts of social support from the cardiac rehabilitation staff (Con, Linden, Thompson, and Ignaszewski, 1999).

After hospitalization, women usually return to their normal household activities of cleaning, cooking, and laundry. Men, after hospitalization are usually off work, until recuperated, and have their family pampering them. Women may not feel that they receive social support because they resume household activities after returning from the hospital. Con et al., (1999) reported that women who perceived low levels of social support were more depressed. Women, also had more depression than men.

The non-compliers had a higher incidence of heart attacks (58.5 percent) than the compliers. In the compliers, 47.7 percent had heart attacks. The compliers had a higher occurrence of PTCA (33.6 percent) and CABG (55.5 percent). The non-compliers had 27.7 percent having PTCA and 43.1 percent having CABG. The compliers had a higher incidence of heart procedures. A reason that they may comply is to prevent having repeat procedures or prevent a heart attack. More of the non-compliers had heart attacks than the non-compliers. The non-compliers may feel that they do not need cardiac rehabilitation because they did not have PTCA or CABG.
Compliers reported a higher frequency and duration of exercise outside of the cardiac rehabilitation program. In addition to the 3 days of exercise per week in the cardiac rehabilitation program, the compliers were exercising on their own 2.8 days per week for 44.7 minutes. The non-compliers reported exercising on their own 1.9 days per week for 25 minutes. Possible reasons that non-compliers do not exercise very often on their own include, work hours, not enough time and denying that they have a problem. The compliers may exercise outside of the program because they enjoy how much better exercise makes them feel.

A total social support score between 70 and 84 represents adequate social support. Scoring between 46 and 69 represents some social support and a score of 45 or less signifies inadequate total social support. With a mean total social support score of 73.9, the compliers had adequate social support. The non-compliers’ mean total support score was 66.0, which indicates that they did not report adequate social support.

Scoring between 35 and 42 in family or staff social support signifies adequate social support, scoring between 24 and 34 represents some social support and scoring less than 23 signifies inadequate support. Compliers family support score indicates that they were receiving adequate support (35.6). The non-compliers fell in the category of some support with a score of 31.0. Compliers had a higher staff social support score (38.3) than the non-compliers staff social support score (35.1). Both groups scored high enough for the adequate support category.
In this study, the non-compliers' total social support and family social support scores were not high enough to be in the adequate support category. However, the staff social support score in non-compliers was higher than the family support and placed in the adequate support category.

The results of this study suggest that social support may affect compliance to cardiac rehabilitation programs. Those patients who complied to cardiac rehabilitation programs, also exercised more on their own than those who did not comply. Social support is not hard to implement, and should be an important part of cardiac rehabilitation. Family support may be increased, if prior to hospital release, there is an education lesson with family members on the importance of supporting the patient.

Recommendations

Several areas regarding social support for patients in cardiac rehabilitation. The following are suggestions for future studies:

1. Study social support and compliance in cardiac rehabilitation programs while controlling for other factors that may affect compliance, such as; age, gender, type/severity of heart problems, and program factors including time, location, and cost. It has been reported that the lack of social support is the main cause of rehabilitation dropouts (Holm, et al., 1985).

2. Determine different methods, such as education for the family of heart patients, to increase the amount of family social support perceived by cardiac rehabilitation patients.
3. Further study of gender differences in compliance and social support of patients in cardiac rehabilitation programs need further study.

4. Study compliance of patients during Phase II rehabilitation and compare with Phase III. Determine if the Phase III non-compliant patients complied with Phase II.

5. Examine whether the amount of encouragement and social support towards cardiac rehabilitation is provided to the patient by the primary physician affects patient compliance.

6. Use personal interviews rather than surveys when examining perceived social support and compliance in cardiac rehabilitation patients. Interviews would permit a deeper probing for factors affecting patients.
REFERENCES


referral to cardiac rehabilitation and cardiac exercise self-efficiency. Clinical Nursing Research, 7 (2), 147-164.


myocardial infarction: Effects of a caring rehabilitation programme.


of participants in home programs compared to those in structured cardiac rehabilitation programs. *Rehabilitation Nursing*, 20 (2), 93 – 101.


Programs Participating in the Study

1. Claremore Memorial Hospital, Claremore, OK
2. Condell Medical Center, Libertyville, IL
3. Fort Atkinson Memorial Hospital, Fort Atkinson, WI
4. Edward Health/Fitness Center, Naperville, IL
5. Health/Wellness Center, Fort Wayne, IN
6. Ingalls Hospital, Harvey, IL
7. Jewish Barnes Hospital, St. Louis, MO
8. King’s Daughter’s Hospital, Madison, IN
9. Lake Forest Health and Fitness Center, Lake Forest, IL
10. Lucerne Medical Center, Orlando, Florida
11. McLaren Hospital, Flint, MI
12. Mercy Hospital, Pittsburgh, PA
13. Mercy Hospital, Janesville, WI
14. Olathe Medical Center, Olathe, KS
15. Park Ridge Hospital, Fletcher, NC
16. Provena Covenant Hospital, Champaign, IL
17. St. Anthony Medical Center, Rockford, IL *
18. St. Elizabeth Hospital, Belleville, IL
19. St. John’s Hospital, Springfield, IL
20. St. Mary’s Hospital, Decatur, IL
21. Sinai-Samaritan Heart Institute, Milwaukee, WI
22. University of Florida Health Center, Jacksonville, FL *
23. V.A. Medical Center, Tampa, FL *
24. Victory Memorial Hospital, Waukegan, IL
25. Wausau Memorial Hospital, Claremore, OK

* Staff Members of these programs were unable to distribute the surveys
APPENDIX B
March 29, 1999

Dear Cardiac Rehabilitation Program Director:

I am currently a graduate student at Eastern Illinois University pursuing a Master of Science degree in physical education with an emphasis in cardiac rehabilitation. Cardiac rehabilitation is an area of great interest to me. For my thesis, I am doing a study pertaining to compliance in cardiac rehabilitation programs.

Success of cardiac rehabilitation depends on the attendance of the participants. To determine why certain people comply with cardiac rehabilitation and others do not, we need to ask participants some questions. The results of the survey will be used to help determine if social support affects exercise compliance in people involved in cardiac rehabilitation programs.

The enclosed survey is designed to determine how support from family and the cardiac rehabilitation staff determines patient attendance. I would sincerely appreciate it if you would help me distribute 20 envelopes to your Phase III patients. Each envelope contains a survey and a self-addressed stamped envelope, for a hassle free return. I am asking the participants to have the surveys in the mail by May 10, 1999.

Would you please randomly hand out 10 white envelopes and their contents to people who are your best attendees. (e.g. More than 75% adherence in the past 3 months) They can complete the questionnaire and return it to me in the enclosed self-addressed stamped envelope.

Now the hard part. Would you please address the 10 yellowish envelopes and mail them to your poorest attendees. (e.g. less than 25% adherence in the past 3 months) Stamps are already placed on the envelopes for you.

If you have any questions or would like to discuss the survey, please feel free to contact me via electronic mail, or telephone. I appreciate your willingness to assist me with my study by sending out the surveys to your cardiac rehabilitation participants.

Sincerely,

Rana M. Smith, Graduate Student
APPENDIX C
March 29, 1999

Dear Cardiac Rehabilitation Participant:

I am currently a graduate student pursuing a Master of Science degree in Physical Education with an emphasis in Cardiac Rehabilitation at Eastern Illinois University. Cardiac Rehabilitation is an area of great interest to me. For my thesis, I am doing a study pertaining to Cardiac Rehabilitation.

I would sincerely appreciate it if you would take a few minutes to complete the enclosed survey and return it to me no later than **May 10, 1999** Please respond to every question and feel free to write comments throughout the questionnaire.

Your response to the survey is completely anonymous and confidential. I sent the surveys to the director of the cardiac rehabilitation program, and therefore do not know who received copies of the survey. Also, the surveys will be returned to me, so that the program directors will not see the completed surveys. Included is a self-addressed, stamped return envelope to send your completed survey.

If you have any questions or would like to discuss the survey, please do not hesitate to contact me by electronic mail, mail, or telephone. Once again I appreciate your willingness to assist me with my study by completing and returning the survey by **May 10**.

Sincerely,

Rana M. Smith, Graduate Student

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APPENDIX D
CARDIAC REHABILITATION QUESTIONNAIRE

The following questionnaire has three sections. Please answer every question to the best of your ability. Feel free to add any comments that you think are necessary.

A. Below are questions pertaining to YOU. For the multiple choice questions, please circle your answer(s). For the remaining questions please fill in the blanks.

1. What is your Age?
   1 Under 40
   2 40 – 49
   3 50 – 59
   4 60 – 69
   5 70 – 79
   6 80 – 89
   7 90 and Above

2. What is your Gender?
   1 Male
   2 Female

3. What cardiac problem(s) have you had? (You may select more than one answer)
   1 Heart Attack
   2 Percutaneous Transluminal Angioplasty (PTCA)
   3 Coronary Artery Bypass Surgery (CABG)
   4 Angina
   5 Atherosclerosis
   6 Congestive Heart Failure
   7 Other ________________

4. How many times a week do you exercise at your cardiac rehabilitation program?_____

5. How many minutes do you exercise at your program?________________________

6. How many times a week do you exercise on your own?_______________________

7. What types of exercise do you do on your own? (Examples: walking the dog, home exercise equipment, or mowing grass)__________________________

8. How many minutes do you exercise on your own?___________________________

9. When did you start in the Cardiac Rehabilitation Program?__________________
   (Month & Year)

(OVER)