

MYOCARDIAL INFARCTION:
A STUDY OF THE EFFECTS ON PATIENT COMPLIANCE
OF STRUCTURED EDUCATION AND PARTICIPATION
OF A SIGNIFICANT OTHER

By

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Abstract

Myocardial Infarction: A Study of the Effects On Patient
Compliance of Structured Education and Participation
of the Significant Other

This study was designed to explore the effects of the independent variables of patient education and the significant other on compliance. The purpose of the study was to test three hypotheses predicting that subjects who receive structured education with their significant other would have higher compliance rates with health care recommendations than would subjects who receive structured and unstructured education without their significant other.

The study was conducted with a convenience sample of 12 male patients who had a significant other and had not experienced a previous myocardial infarction within five years. The convenience sample was then randomly and equally allocated into three groups. The control group received unstructured education as currently practiced by nursing staff. One experimental group received structured education from the investigator and the other experimental group of subjects and their significant other received structured education from the investigator.

Using a semi-structured interview guide, the investigator interviewed each subject at one month and at three to four months postdischarge from hospital to determine compliance rates with physical activity, dietary, and medication health care

recommendations as prescribed by the subject's physician.

Open-ended questions were used to determine recommendations and difficulties encountered by noncompliers. More specific questions were used to allow subjects to rate their compliance. Results were subjected to the Kruskal-Wallis rank-sum test with one-way analysis of variance.

Statistically significant differences ($p < .05$) were not found suggesting that method of patient education was not a valid prediction of compliant behaviour. The insignificant findings of this study need to be interpreted with caution because of the small sample size and between group differences of the demographic variables of age and employment.

From general observations of the total sample, personal definitions of health, simultaneous demands and the extent of behavioural changes required, and the demographic variables of education and employment appear to influence compliance. These findings suggest that individual differences have an impact on compliant behaviour. Findings also suggest that the significant others of patients with myocardial infarctions are actively involved with the therapeutic regimen prescribed for their mates.

The study discusses implications and recommendations for nurse practitioners and researchers who wish to improve their care of myocardial infarction patients and their significant others.

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CHAPTER 1

Introduction

In 1982, cardiovascular diseases were identified as the number one killer of Canadians with 28,865 deaths caused by myocardial infarctions (Statistics Canada, 1984). Survivors of a myocardial infarction, the result of chronic coronary artery disease, are required to alter behavioural patterns to accommodate changes in lifestyle. In order to maintain or improve health, individuals recovering from a myocardial infarction are required to comply with therapeutic regimens such as dietary and activity restrictions, and the daily ingestion of medication (Rahe, Scalzi & Shine, 1975; Stokols, 1975).

"One of the major unsolved problems confronting health care workers is patients' poor compliance with their prescribed therapeutic regimens" (Hoepfel-Harris, 1980, p. 449). Health care workers cannot ignore the fact that approximately one-half of all patients do not comply with the therapeutic regimens prescribed for them (Davis, 1968; Gillum & Barsky, 1974; Rosenstock, 1975).

Statement of the Problem

A plethora of studies of noncompliant patient behaviour suggest that an enigma continues about the types of interventions that are most appropriate to enhance compliance and facilitate the effectiveness of the therapeutic regimen (Vincent, 1971).

Numerous studies have investigated the effect of structured versus unstructured educational interventions on patient knowledge of and/or compliance with a therapeutic regimen following a myocardial infarction (Bille, 1977; Milazzo, 1980; Scalzi, Burke & Greenland, 1980; Sivarajan, Newton, Almes, Kempf, Mansfield & Bruce, 1983). Therapeutic regimens involving lifestyle changes such as medication-taking, dietary restriction, and prescribed physical activity, are activities usually shared with a significant other; however, few studies have investigated the education of the significant other or the impact of the significant other on compliance (Mayou, Foster & Williamson, 1978; Tyzenhouse, 1973). Therefore, this study was designed to explore the effects of structured education, for male patients and their significant others, on compliance with health care recommendations for patients recovering from a myocardial infarction after discharge from the hospital.

Purpose of the Study

The purpose of this study was to test the following hypotheses:

1. Myocardial infarction patients receiving structured education with the significant other will have higher rates of compliance with health care recommendations than myocardial infarction patients receiving structured education without their significant other.

2. Myocardial infarction patients receiving structured education with their significant other will have higher rates of compliance with health care recommendations than myocardial infarction patients receiving unstructured education.

3. Myocardial infarction patients receiving structured education will have higher rates of compliance than myocardial infarction patients receiving unstructured education.

Definition of Terms

The following terms are first defined according to the literature and are then operationally defined for the purpose of this study.

Education program. A program including slides, audiotapes, and manual which was designed and produced by the American Heart Association and titled, "An active partnership for the health of your heart (after your heart attack)". The purpose of the program was to increase patient knowledge of coronary heart disease and methods of risk factor reduction (Barbarowicz, Miller, Haskell & DeBusk, 1976).

Structured education. An organized method of imparting specific knowledge to another (Toth, 1980). Structured education was operationally defined as a sequential delivery of the program by the investigator to the subject, or to the subject and significant other over a two to three day time span. The content and its relationship to the subject's lifestyle were discussed

after each tape as directed by educational objectives developed by the investigator (see Appendix A).

Unstructured education. An unorganized or incidental method of imparting specific knowledge to another (Toth, 1980). Unstructured education was operationally defined as the random delivery of a portion or the total program by one or more nursing staff as a routine nursing assignment to one individual or to groups. Delivery of the program and individual discussion were unorganized or incidental as dictated by the environment of the ward and as practiced by nursing staff.

Myocardial infarction. Death of myocardial tissue demonstrated by electrocardiographic findings and elevated serum levels of the cardiac enzymes (Toth, 1980). Myocardial infarction was operationally defined as the death of myocardial tissue demonstrated by diagnosis of the cardiologist, electrocardiographic findings, and elevated serum levels of the cardiac enzymes: serum glutamic oxaloacetic transaminase, lactic dehydrogenase, and creatine phosphokinase.

Health care recommendations. The medical regimen prescribed by the physician (Marston, 1970). Health care recommendations were operationally defined as the documented regimen prescribed by the attending cardiologist at discharge with the intention of maintaining or improving the subject's cardiac status (see Appendix B). The independent variables for this study were recommendations

related to physical activity restrictions, dietary restrictions, and medication-taking (oral drugs).

Compliance. Follow-through on health care recommendations prescribed by the appropriate health care provider (Linde & Janz, 1979). Compliance was operationally defined as the subject's estimates of follow-through on recommendations prescribed by the cardiologist all of the time.

Noncompliance. The lack of follow-through on health care recommendations (Linde & Janz, 1979). Noncompliance was operationally defined as the subject's estimates of follow-through on health care recommendations prescribed by the cardiologist less than all of the time.

Significant other. The significant other was operationally defined as the wife of the subject or the common-law wife where the couple had co-habitated for a time period of three years or more.

Assumptions and Limitations of the Study

This study assumed that:

1. The goal of each individual recovering from myocardial infarction was the independent practice of activities to perform self-care.
2. Each individual encountered a deficit relationship between the needs for self-care and the ability to perform self-care when diagnosed as having a myocardial infarction.

3. Structured patient education using a slide-tape format and manuals as produced by the American Heart Association with the guidance of a nurse was an effective method to impart knowledge about recovering from a myocardial infarction.

This study was limited by:

1. Personal confounding variables of age, education, employment, and complicating physical factors.
2. Lack of final discharge instructions in terms of dietary and medication health care recommendations at the time of the educational sessions.
3. Interpretation of compliance with health care recommendations by the subjects whose estimates may not have been accurate.
4. Contact with the researcher during patient education sessions and following discharge which may have influenced the compliance rates of the subjects in the experimental groups.
5. The small sample size studied.

CHAPTER 2

Review of the Literature

An abundance of valuable literature has been written about individuals recovering from a myocardial infarction. A theoretical background is presented in this chapter leading into a description of the three theoretical frameworks chosen to provide guidance for this study. This literature review was limited to the effects of knowledge and patient education and the influence of the significant other on compliance as guided by the theoretical frameworks. The literature that will be discussed was largely limited to myocardial infarctions but some other studies appeared relevant and have been included. Despite the contemporary usage of the terms family and significant other, most studies pursued male subjects and their wives or spouses so these terms will be addressed as such throughout the review.

Theoretical Background

To maintain or improve health following a myocardial infarction and to reduce risk factors associated with heart disease, health care workers expect an individual to change or adapt behavioural patterns by complying with health care recommendations. Health care workers recommend that the individual consume diets low in calories, sodium, cholesterol, and fats; gradually resume physical activities to a similar or more advanced level than experienced prior to the attack, and ingest a variety of

drugs to promote effective functioning of the heart (Barbarowicz et al., 1976). In order to promote appropriate behavioural changes, information concerning the recommendations must be given to the individual (Linde & Janz, 1979). The outcome of patient education is, " . . . independence achieved through knowledge, and the assumption of responsibility for self-care" (Bell & Whiting, 1981, p. 28).

Dietary and activity restrictions and the use of medications are behavioural changes that begin within the hospital environment and continue into the home environment where the individual and significant other reside. Litman (1974) states, "the family constitutes perhaps the most important social context within which illness occurs and is resolved" (p. 495). Therefore, the effect of a myocardial infarction on an individual cannot be considered in isolation as the event is bound to have an impact on the significant other which in turn enhances or depresses the individual's rehabilitation (Davidson, 1979; Skelton & Dominian, 1973).

Baden (1972) emphasizes the importance of family education on the rehabilitation of an individual with a myocardial infarction by saying:

An integral part of a patient's care and rehabilitation is the education of his family so that they can be a help rather than a detriment to him. The family and friends of the patient can have a direct influence not only upon his acceptance and understanding of his heart condition, but also upon his adaptation to modifications in his lifestyle. (p. 565)

Therefore, to enhance patient compliance, information should be communicated to the individual and the significant other via an education program designed to promote appropriate behavioural changes.

Theoretical Frameworks

Three theoretical frameworks were selected to provide direction for this study:

Orem's (Orem, 1980) model for nursing was chosen to provide guidance for investigating the concepts of knowledge, patient education, and compliance.

Dubos' (Dubos, 1965) theory of adaptation was selected to provide direction for studying the significant other as the individual's social support system.

Bandura's (Bandura, 1977b) social learning theory was chosen to provide direction for the use of structured teaching tools and the influence of the significant other as a teaching aid for patient education.

Orem's model for nursing. Orem's model for nursing as described by Orem (1980) and Joseph (1980) recognizes an individual as a self-care agent who is capable of performing self-care activities that are acquired via learning. Inherent within the framework are four concepts: self-care, therapeutic self-care demands, self-care agency, and nursing agency.

Orem (1980) defines self care as, "the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being" (p. 35). Within the context of this definition, compliance with a therapeutic regimen is considered to be self-care. With the introduction of a health deviation such as myocardial infarction, self-care demands for diet, activity, and safety via the use of medication evolve into therapeutic demands which require satisfaction via specific patient actions to ensure an improved level of health.

The self care agency is the individual's capability to engage in and perform the self-care actions. If an individual with a myocardial infarction is unable to meet the therapeutic self-care demands, then a deficit relationship exists between the demands and the self-care agency in the form of lack of knowledge and/or ability.

The nursing agency is the ability of the nurse to perform nursing actions to improve or eliminate the deficit relationship that exists between the therapeutic self-care demands and the self-care agency. Nursing actions are designed to facilitate and increase the self-care abilities of an individual and these abilities can be enhanced through patient education. By teaching an individual with a myocardial infarction about the disease process, risk factors associated with heart disease, and methods to reduce the risk factors, the self-care agency should be equipped with knowledge and skills rendering the individual capable of

performing self-care activities to meet the therapeutic self-care demands for diet, activity, and the use of medication. The outcome of patient education is self-care or compliance with a therapeutic regimen following the acquisition of knowledge.

Orem's model for nursing provides a framework to investigate the concepts of knowledge, patient education, and compliance. Orem predicts that by providing the individual with knowledge, via patient education, compliance will occur (Orem, 1980). This framework can also be applied to the significant other of an individual whose knowledge may be limited when required to assist an individual recovering from a myocardial infarction.

Orem's model for nursing was used by Marten (1978) to study a patient experiencing a radical change in body image, and by Toth (1980) who studied patient anxiety on leaving the coronary care unit following education. The model provided a satisfactory framework to investigate the independent variables.

Dubos' theory of adaptation. According to the writings of Dubos (1965) and additional descriptions of Dubos' work (Smith, 1981), health is the state of an individual that permits effective interaction with the physical and social environment. Each individual defines his/her health state and attains this state by adaptive behaviour.

According to Dubos, an individual with a myocardial infarction is in an unhealthy state which is the direct result of his/her failure to adapt to the illness. The individual must change living

patterns and adapt these patterns to meet the needs for nutrition, activity, and recovery through medication-taking. The stimulus to adapt and modes of adaptation are located within the individual and his/her social support system. The individual's social relationships are of paramount importance for the support and encouragement to complete adaptation and attain a state of health. Within the social support system, the individual senses a feeling of belonging and togetherness engendering a feeling of security which increases the chances for success and happiness.

Dubos' theory of adaptation provides a framework for investigating the importance of the significant other as an individual's social support system.

Bandura's social learning theory. Bandura's social learning theory (1977a, 1977b), views learning as a reciprocal interaction among personal, behavioural, and environmental determinants. Learning is a cognitive ability; however, stimuli for learning are located in the environment. Individuals with myocardial infarctions are motivated to learn as a result of their physiological state. Individuals learn vicariously or by verbal persuasion of others. Vicarious learning occurs from verbal or visual methods and within this definition, slides, audiotapes, and manuals are considered to be beneficial teaching tools. Verbal persuasion by others, such as the nurse and significant other, provides stimuli of reinforcement and support during the learning process and enhances learning. An individual can learn from one

stimulus; however, learning will occur at a more rapid rate and the behavioural changes will endure longer if more than one source of stimuli is presented.

Bandura's social learning theory provides direction for the use of structured teaching tools and the use of the significant other as a teaching aid to enhance patient learning and compliance.

Summary of theoretical frameworks. A combination of Orem's model for nursing, Dubos' theory of adaptation, and Bandura's social learning theory provided direction for this study.

The theories suggest that an individual with a myocardial infarction has a knowledge deficit during hospitalization, and is unable to meet his/her needs for lifestyle change in the areas of physical activity, diet, and medication-taking. By manipulating the structure of the educational format and introducing a variety of stimuli for learning, compliance with health care recommendations should be enhanced accordingly. Thus, structured education should have a greater effect on the patient's ability to perform self-care than unstructured education. Furthermore, individuals who receive structured education with their significant other in attendance should achieve higher rates of compliance than subjects who received structured education alone, and subjects who received unstructured education alone.

The combination of frameworks directs this study to review the literature in the areas of compliance, knowledge, patient education, and the influence of the significant other.

Compliance

The word "compliance" is accepted terminology in the field of health care despite the negative connotation. The term compliance tends to imply a certain relationship in which the physician gives instructions and the patient complies, co-operates, and/or obeys (Kasl, 1975). Adopting this perspective of the patient-physician relationship, noncompliers are considered to be deviants. That is, adherence to prescribed recommendations is "normal" and variations from the recommendations are considered to be "deviant" (Porterfield, 1981); however, current usage of the word tends to be taken in a much broader context. Regardless of the terminology, compliance with health care recommendations is essential in the control and prevention of disease (Hogue, 1979).

Difficulties with compliance have been well-documented in the literature. Davis (1968) reported that 40% of the patients who attended a general medical clinic never intended to comply with their prescribed regimen. Patient noncompliance with health care recommendations has continued to be a major unsolved problem confronting health care workers (Gillum & Barsky, 1974; Hoepfel-Harris, 1980).

Numerous studies have reported compliance rates with health care recommendations; however, studies are difficult to compare as

a result of the variety of compliance definitions, the variation of measurement tools, and the diversity of recommendations being measured (Marston, 1970).

Several studies have examined compliance with risk factor recommendations. Rosenstock (1975) concluded that 50% of all patients under a physician's care, will not comply with prescribed regimens for the full time period or precisely as ordered. Structured and unstructured education and their relationship to compliance have been examined. Using both teaching formats for individuals with myocardial infarctions, Bille (1977) reported rates of 74% and 79% respectively for compliance with coronary risk factors prescribed by the physician at one month following discharge from hospital. Linde and Janz (1979) documented rates of 86% at one month and 93% at three to four months postdischarge from hospital for compliance with coronary risk factor reduction prescribed by the attending health care worker. Subjects had undergone coronary artery bypasses and were exposed to structured teaching methods.

Several studies have examined compliance with physical activity recommendations for individuals with myocardial infarctions. Oldridge, Wicks, Hanley, Sutton and Jones (1978) found that 43% of subjects were noncompliers with a rehabilitation program of physical activity during the first year of the program. Royle (1973) measured attitudes to activity recommendations one month after discharge and found that 12% of the subjects complied,

70% complied as well as able, and 18% disregarded the recommendations. Rudy (1980) examined causal explanations for myocardial infarction and reported that 32% of her sample engaged in preplanned exercise.

Bloch, Maeder, and Haissly (1975) studied resumption of sexual activity one year after a myocardial infarction. Of the subjects who were sexually active prior to the infarction, 22% of the sample abstained from sexual relations, 53% diminished activity, and 25% maintained or increased the frequency of sexual activity. Subjects had not received education.

Other studies have investigated compliance with dietary recommendations for individuals with myocardial infarctions. Royle (1973) measured attitudes to dietary recommendations and found that 18% of the sample complied with the recommendations and 41% complied as well as they were able. Rudy (1980) reported that 76% changed dietary habits. Scalzi et al. (1980) examined adherence to a combination of low sodium and low cholesterol diets and found that subjects who received structured education reported optimal compliance at one month post discharge declining to good compliance at three months whereas subjects who received unstructured education reported fair to good compliance at both times. Sivarajan et al. (1980) found that consumption of high-cholesterol, high-saturated fat, and high sodium foods decreased over a six month time span following structured and unstructured education; however, results were not significant. Linde and Janz (1979)

reported a 93.3% compliance rate with dietary recommendations at one month post discharge and an 83.3% compliance rate at three months for coronary bypass subjects following an education program.

Some studies have investigated compliance with medication recommendations. From a large study of the chronically ill, Greene, Weinberger, Jerin, and Mamlin (1982) found that 26% of the sample always complied with medication regimens, 46% complied most of the time, and 26% complied less than half of the time. From studies of individuals with myocardial infarctions, Royle (1973) reported that 93% of the sample complied all of the time and only 7% disregarded some of the instructions. Scalzi et al. (1980) reported near optimal compliance for subjects who received unstructured education with medication recommendations.

From the preceding review, it is evident that studies investigating compliance are difficult to compare and none reported 100% compliance rates. Some studies suggested that compliance was more likely to occur with health care recommendations that require the least change. Taking oral medications appeared to be the least difficult behaviour to change whereas dietary changes appeared to be the most difficult (Gillum & Barsky, 1974; Oldridge et al., 1978). Important factors identified to enhance compliance were patient education, family encouragement, support, and reinforcement (Davis, 1968; Gillum & Barsky, 1974; Oldridge et al., 1978).

Knowledge

Numerous studies have identified lack of knowledge as a source of noncompliance. Royle (1973) interviewed 20 male subjects with myocardial infarctions and six of the subjects' wives following discharge from hospital. Most subjects demonstrated limited knowledge of their therapeutic regimen and complained of vague instructions given by health care workers. Subjects and their wives identified physical activity and dietary limitations as major sources of apprehension. Low anxiety levels were experienced by the subjects when specific instructions about the regimen were received and high anxiety levels resulted from vague instructions. Royle found that failure to follow a therapeutic regimen was the result of lack of understanding of the regimen and limited support from spouses. The inability of the wives to provide support was attributed to lack of information. A similar study found that four out of seven subjects demonstrated needs for information during the early recovery period at home (Pfisterer, 1975).

From interviews with myocardial infarction patients and their spouses or significant others, Rudy (1980) found the following:

When patients resumed everyday activities, patients and spouses became aware that decisions confronted them and that they lacked relevant information. Wives frequently expressed the fact that they had not been included in patient education sessions and in discharge planning to a significant degree. Inclusion of spouses in discharge planning was usually limited to diet and medication instructions. (pp. 355-356)

Crawshaw (1974) attributed severe vocational disabilities following a myocardial infarction to fear and to vague instructions

about employment resumption. Vague instructions created knowledge deficits resulting in minimum exertion by patients which retarded their vocational abilities. The majority of patients with vocational disabilities fell within the unskilled, semi-skilled, and skilled trades. Crawshaw also blamed lack of knowledge as the prime reason for the inability of the wives to provide support during recovery and suggested that education be given to the couple to promote recovery. Similar findings were reported by Segev and Schlesinger (1981).

Recently, several researchers have explored the area of sexual activity after myocardial infarctions. Sexual relations are natural activities within a marital or common-law dyad yet research indicated that frequency and pleasure associated with intercourse diminished after one member suffered a myocardial infarction. The reason for marital discord was the equation of sexual behaviour with strenuous activity imposing the associated risk of sudden death. The cause of this misconception was lack of information which created fear in both the patient and partner (Cole, Levin, Whitley, & Young, 1979; Mims, 1980; Puksta, 1977; Scalzi & Dracup, 1978). Henrick (1979) reported that when male subjects received instruction regarding sexual activity without the inclusion of their partners, their rehabilitation was severely hampered as a result of lack of support and knowledge from the partner.

Several studies found that the emotional trauma associated with a myocardial infarction during the acute phase resulted in

patients forgetting, misinterpreting, and relaying incorrect information to families despite the fact that verbal instructions were given to the patient by health care workers. Without relevant information, patients and families encountered difficulties with their attempts to follow a therapeutic regimen (Baden, 1972; Rahe et al., 1975; Scalzi et al., 1980; Toth & Toth, 1977).

When relevant information about a therapeutic regimen was not provided by health care workers, patients with myocardial infarctions and their spouses tended to seek advice from friends, relatives, and co-workers. Misconceptions about heart disease, expected behaviours, life expectancy, and demands to make of others further hindered the patients' abilities to follow a therapeutic regimen and limited the abilities of the significant others to provide support during rehabilitation (Crawshaw, 1974; Larter, 1976; Royle, 1973; Segev & Schlesinger, 1981).

As a group, the studies suggested that individuals with myocardial infarctions encountered difficulties with activity, dietary, and medication recommendations following discharge from hospital and that failure to follow a therapeutic regimen was a result of lack of knowledge, vague instructions by health care workers, and limited support from the significant others because of their limited knowledge. However, many patients and their significant others wanted and expected to receive information, during hospitalization, about heart disease and its effects on their future (Baden, 1972; Royle, 1973). Recently, health care

workers have explored the area of patient education and its relationship to rehabilitation.

Patient Education

From the literature, two types of patient education were defined and investigated: structured and unstructured.

Structured patient education tended to be defined as an organized and sequential delivery of information. Numerous approaches have been discussed in the literature. The programs were directed by behavioural objectives and imparted to the individual, family, or group. The purpose of the program was to induce health enhancing behaviours to achieve optimal health following a myocardial infarction via the provision of knowledge about a therapeutic regimen. Content of a structured program for myocardial infarction patients addressed anatomy and physiology of the heart, the healing process, drug therapy, emotional factors, and risk factors such as diet, obesity, activity, smoking, and stress. Teaching format consisted of lectures, discussions, slides, audiotapes, videotapes, and/or films and was supplemented with manuals or pamphlets for home use. Instructors were limited to one nurse or a selected group of health care workers with specialized educational training who provided some form of individual discussion and follow-up after presentation of content (Bille, 1977; Bracken, Bracken, & Landry, 1977; Linde & Janz, 1979; Milazzo, 1980; Scalzi et al., 1980; Sivarajan et al., 1983).

Unstructured patient education was any type of teaching that the nurse or physician devised and instituted on a more informal basis. The instructors did not follow set behavioural objectives or sequential patterns. Style, timing, and content were at the discretion of the instructor which tended to result in spontaneous, fragmented, and disorganized teaching sessions (Barbarowicz et al. 1980; Bille, 1977). Patient education was part of a routine nursing assignment, performed at the nurse's convenience, and eliminated if staffing shortages or time constraints occurred. The target of instruction was the patient and the instructors tended to be several nurses as a result of rotating shifts. Individual patient discussions and follow-up tended to be poorly documented (Barbarowicz et al., 1980; Bille, 1977; Milazzo, 1980; Scalzi et al., 1980).

"Teaching patients about the characteristics of their disease is a time honoured nursing approach to enhancing compliance" (Hogue, 1979, p. 252). Nurses advocate patient education as a primary method to promote compliance; however, in the literature there are conflicting reports about the efficacy of patient education programs on patients' knowledge and subsequent compliance.

Using a three-group before-and-after design, Milazzo (1980) studied male subjects recovering from a myocardial infarction to determine the effects of structured teaching on knowledge levels. Milazzo found a significant difference ($p < .05$) in the test scores

among groups and concluded that subjects had greater knowledge levels about their illness following structured education than unstructured education. Milazzo did not relate knowledge scores to compliance.

In a similar study, Bille (1977) found that knowledge levels of individuals with myocardial infarctions were similar with or without the use of a structured teaching format. He also reported that compliance with a therapeutic regimen prescribed by the physician was not significantly related to knowledge levels or to the educational format. Bille used an interesting compliance questionnaire to determine the physician's recommendation, compliance rate, and difficulties associated with noncompliance; however, he did not break the recommendations into finer categories, reported only group mean compliance rates, and did not discuss difficulties encountered by noncompliant individuals. In this study, no attempts were made to validate subjects' perceptions of their instructions with the physician and the investigator did not participate in educational sessions.

In a similar study of individuals with myocardial infarctions that covered a two year time span, Scalzi et al. (1980) also found insignificant differences between knowledge levels and structured and unstructured teaching methods, and attributed negative findings to limited knowledge retention of the subjects during hospitalization. However, subjects who received structured education demonstrated better compliance with medication and

physical activity recommendations. Significant differences were not obtained for dietary recommendations. Subjects who received structured education consistently had higher compliance scores with all three recommendations; however, the levels tended to decline by three months post discharge. The investigators suggested that better compliance in the structured teaching group was the result of continued instruction during follow-up visits by the researcher. Scalzi et al. found that the distribution of printed material for home use provided convenient reference material after discharge.

Sivarajan et al. (1983) concluded that a structured education program on risk factors instituted after discharge from hospital demonstrated limited effectiveness on behavioural changes with dietary recommendations following a myocardial infarction. However, all subjects had participated in education programs during hospitalization that varied from information provided in booklets and cassettes to detailed teaching sessions with pre and posttesting. The investigators made no attempt to compare the type of teaching during hospitalization to study results obtained from the control and experimental groups. They measured behavioural changes from prehospitization to postdischarge without considering whether or not the subjects were specifically instructed by health care workers to change particular behaviours.

Similar studies using coronary artery bypass subjects were reviewed because of the semblance of the therapeutic regimen. Barbarowicz et al. (1980) found that knowledge scores were twice as

great for subjects who received structured education ($p < .001$) and remained significantly higher for three months when compared to scores of subjects who received unstructured education. When knowledge scores were related to health enhancing behaviours, there were no significant differences between the groups.

Linde and Janz (1979) reported similar findings for knowledge levels but also found that structured education enhanced compliance. Limiting effects of the study were that no control group was used and compliance rates were compared to and were significantly higher than a similar study conducted in 1963. One problem encountered by the researchers was the difficulty in assessing whether the higher compliance rates were a result of the structured education program and/or the continuity of care provided by the investigators.

Other researchers have reported positive associations between structured patient education and compliance for patients with noncardiovascular disorders. Bowen et al. (1961) studied patients with diabetes mellitus and discovered that patients who received structured education demonstrated a significantly greater gain in knowledge about their disease and increased skill performance with their treatment than patients who received unstructured patient education.

Hecht (1974) randomly divided patients with a diagnosis of tuberculosis into four groups. The experimental groups received staggered levels of structured education and the control group

received no special teaching. Results showed that patients in the experimental group made fewer drug errors than those patients in the control group. Compliance was measured by pill count where serious errors were reduced from 53% in the control group to 17% in the group that received the most intensive teaching.

From the literature review on patient education, evidence suggested that structured patient education resulted in higher knowledge levels about cardiac illness than unstructured teaching methods (Barbarowicz et al., 1980; Linde & Janz, 1979; Milazzo, 1980). Conflicting results were reported for the efficacy of structured patient education on compliance. Some studies found positive relationships (Linde & Janz, 1979; Scalzi et al., 1980; Bowen et al., 1961), whereas other studies found no relationships (Barbarowicz et al., 1980; Bille, 1977; Sivarajan et al., 1983). The literature suggests that increased health knowledge was frequently insufficient in enhancing compliance with health care recommendations but was shown to be an influential factor in increasing readiness to undertake recommended health behaviours (Barbarowicz et al., 1980; Hogue, 1979; Milazzo, 1980). Further documentation of the efficacy of structured patient education in reaching positive treatment outcomes is required (Lee & Garvey, 1977).

It was interesting to note that from the research on patient education, several studies neglected to mention the inclusion of the significant other in educational sessions (Bille, 1977; Bowen

et al., 1961; Milazzo, 1980). Other studies encouraged the significant other to attend educational sessions; however, participation or attendance was not enforced (Barbarowicz et al., 1980; Bracken et al., 1977; Linde & Janz, 1979; Scalzi et al., 1980; Sivarajan et al., 1983).

Influence of the Significant Other

Several researchers have suggested that the limited knowledge of a significant other about the therapeutic regimen was a pertinent factor affecting their partner's inability to comply with the regimen (Crawshaw, 1974; Royle, 1973; Rudy, 1980; Segev & Schlesinger, 1983).

Few studies have examined the effect of the significant others level of knowledge on the health-related behaviours of their partner. Tyzenhouse (1973) interviewed male subjects with myocardial infarctions and their wives posthospitalization and found that wives with the most knowledge did not have husbands who showed a corresponding improvement in health. None of the wives stated that she influenced the activities of her husband. Tyzenhouse concluded that a wife needs to understand the therapeutic regimen and its importance but may serve the husband's recovery best through supportive rather than directive activities. Tyzenhouse estimated knowledge and health improvement and did not relate her findings to any type of patient education.

Research has shown that the attitudes of the wife have a considerable effect on the partner's emotional adaptation to heart disease, compliance with the associated therapeutic regimen, and successful rehabilitation during the convalescent period (Adsett & Bruhn, 1968; Bedsworth & Molen, 1982; Davidson, 1979). Heinzelmann and Bagley (1970) found that male subjects with coronary artery disease had compliant behavioural patterns with a physical fitness program, and that this was directly related to the wife's attitude toward the program.

Aho (1977) interviewed married women and discovered that these women had strong beliefs about playing a role in the prevention of heart disease in their husbands, that heart disease was preventable, and that treatment was effective. However, most wives did not worry about their husbands developing heart disease and few had suggested health related behaviours to them.

Wives of husbands with myocardial infarctions saw their role during recovery as preparing recommended foods, protecting their husbands against future infarctions, and generally helping their husbands follow the treatment regimen (Adsett & Bruhn, 1968; Baden, 1972; Royle, 1973). Mayou et al. (1978) found that one-half of the wives in their sample consulted the physician about their husbands' progress, administered medication, and participated or actively encouraged their husbands with their efforts to diet or take exercise. Mayou et al. found that the wives influenced the rate and extent of convalescence of their husbands up to one year

following the myocardial infarction and that the attitudes and behaviours of the wives were important factors in the successful recovery of their husbands. Mayou et al. recommended that advice about the therapeutic regimen be given to the wives during recovery to exert a positive influence on their partners.

Becker and Green (1975) found that wives influenced the behaviour of their husbands by communication, pressure, or acting as role models and stated that within the family unit, compliant behaviour would likely be performed by the partners if the wives supported the prescribed therapeutic regimen.

Ruskin, Stein, Shelsky, and Bailey (1970) tested individuals with myocardial infarctions and their wives using the Minnesota Multiphasic Personality Inventory. When test results were compared, the wives demonstrated a greater ego strength, a better sense of reality, and stronger feelings of personal adequacy when compared to their husbands. The wives were psychologically healthier, less socially introverted, and were more able to influence the behaviour of others. Inclusion of wives in patient education was recommended for the successful rehabilitation of their husbands.

From a review of family studies, Litman (1974) stated, "the ultimate success of the family's involvement in home treatment may in large part revolve around its ability and preparation to do so" (p. 506). The literature suggested that a significant other was capable of exerting a positive influence on her partner's

compliance with physical activity, dietary, and medication recommendations if provided with knowledge about the therapeutic regimen (Adsett & Bruhn, 1968; Becker & Green, 1975; Mayou et al. 1978). Significant others were physically and psychologically healthier than their partners (Ruskin et al., 1970), perhaps suggesting that significant others could acquire and retain information more readily than their mates during the acute phase of a myocardial infarction and could be capable of reinforcing health enhancing behaviours during recovery at home when health care workers are not available.

Summary

From the literature review of compliance, knowledge, patient education, and the influence of the significant other, the studies as a group suggested that patient compliance with health care recommendations continues to be a major problem confronting health care workers and that noncompliance can be related to lack of knowledge of both the individual and his significant other, vague instructions, and lack of support from the significant other. Research to determine the best method of structured versus unstructured teaching methods and the effect on enhancing compliance has not been attained. Although research indicated that significant others were capable of positively influencing compliance of their partners when provided with relevant knowledge, no scientific evidence was found to substantiate improved

compliance when significant others are included in patient education.

CHAPTER 3

Methodology

Descriptions of the research design, setting and sample begin this chapter, followed by a description of the education program in progress at the hospital under study. This lays the groundwork to describe the manipulation of the independent variables. The data collection instrument is then described as well as the development and administration of the instrument. A description of ethical considerations concludes this chapter.

Research Design

This study employed an explanatory experimental design to accept or reject the stated hypotheses.

Explanatory designs are used to predict and explain the interaction of variables when sufficient data about the variables are known. The interaction of the variables must be guided by a conceptual or theoretical framework. Explanatory designs provide strategies for examining evidence to accept or reject hypotheses (Brink & Wood, 1978).

Experimental designs are used when the investigator has control of subject assignment to different experimental conditions and can manipulate the independent variables. Use of control groups can limit the interference of other variables. By random assignment of subjects to either a control or experimental group, two equivalent groups at the start of the study are possible. By

subjecting one of the groups to the experimental variable, it is possible to attribute changes that occur in the experimental group and not in the control group to the effect of the independent variable (Brink & Wood, 1978).

Previous study findings presented in the second chapter, described the potential effects of the independent variables of structured patient education and the significant other on the dependent variable of compliance with health care recommendations. The selection of independent variables was guided by a combination of Orem's model for nursing, Dubos' theory of adaptation, and Bandura's social learning theory.

Extraneous variables such as age, occupation, education and previous myocardial infarctions could not be fully controlled within the confines of this study even though random assignment was used as a result of the small sample size. Demographic variables will be addressed in Chapter 4.

The Setting

The setting for this study was one cardiac ward of a large metropolitan teaching hospital. The hospital served individuals who resided or worked in the downtown core or surrounding areas. The hospital provided highly skilled staff and modern equipment to perform cardiac monitoring, a wide range of diagnostic tests, pacemaker insertions, and open-heart surgery for individuals who experienced cardiac complications. The hospital was a major

referral centre for cardiac patients from smaller, regional institutions.

Individuals with suspected myocardial infarctions were routinely admitted to the coronary care unit where electrocardiograms and serum enzyme tests were performed to confirm the diagnosis. Approximately 250 individuals with confirmed myocardial infarctions were entered into the census of the coronary care unit over the preceding years.

When their condition became more stable, individuals were transferred to private or semi-private rooms on a 35-bed cardiac ward until discharged by the attending cardiologist. Individuals with cardiac problems other than myocardial infarction, as well as pre and postopen heart surgical patients, were admitted to the cardiac ward.

Sample Selection

The target population for this study included male patients between the ages of 30 and 70, with significant others, who sustained a myocardial infarction and were admitted to the cardiac ward of one hospital during the time period for patient selection into the study. The time period was from January 1, 1983 to February 29, 1984. Although the hospital admitted large numbers of confirmed myocardial infarctions during the time frame of the study, the hospital's census was down and few individuals met the criteria established for this study. The researcher anticipated

obtaining a sample of 15 patients; however, lack of subjects meeting specified criteria resulted in a sample of 12 patients.

Criteria for Selection of Patients. As originally planned, eight criteria were established for patient selection into the study. Criteria for study inclusion were:

1. The patient was male between the ages of 30 and 70.
2. The patient had not suffered a previous myocardial infarction within the last five years.
3. The patient was attended to by a cardiologist.
4. The patient resided with a significant other.
5. The patient was literate and spoke the English language.
6. The patient was oriented.
7. The patient resided within the Greater Vancouver area.
8. The patient was willing to participate in the study.

Rationale for Criteria. A variety of reasons prompted the investigator to select specific criteria for study inclusion.

Male subjects were selected because the literature suggested that more men than women experienced myocardial infarctions (Barbarowicz et al., 1976; McDill, 1975). Studies investigating both sexes with myocardial infarctions supported the above findings. Sivarajan et al. (1983) studied 219 men and 39 women. Rahe et al. (1975) had a study sample of 19 men and 5 women. Bracken et al. (1977) investigated a sample group of 31 patients with 74.2% being men. Restricting the target population to males controlled for the influencing factor of sex, and potential

benefits derived from the study might be generalized to the larger group of patients with myocardial infarctions.

The primary reason for age limitations was the investigator's interest in studying men who were currently employed or recently retired. The investigator assumed that a myocardial infarction would have a major impact on men and their significant others within the specified age group. Lack of subjects meeting the selected criteria resulted in an increase of the age limit to 80 years midway through the study. Only one subject met the revised criteria.

Patients experiencing a first myocardial infarction were selected to control for the variable of knowledge. Patients who had suffered a myocardial infarction more than five years ago were included in the study as their recall of information and the patient education program if applicable, was probably limited. This particular criterion eliminated numerous subjects from possible study inclusion. A large number of patients admitted to the cardiac ward were experiencing second and third myocardial infarctions within a shorter time span than five years which further justified the investigation of adequate patient education to enhance compliance, prevent reoccurrence, and reduce mortality figures.

Subjects required an attending cardiologist who was deemed an expert at diagnosing and treating myocardial infarctions. All cardiologists on staff at the hospital supported patient

participation in the education program and wrote discharge instructions as previously described for the patients to take home. The documented health care recommendations were used as a reference by the investigator for providing factual data.

The subjects required a significant other. From the literature review, the significant other appeared to have the most effect on the recovery process and the patient's compliance with health care recommendations. Only the significant others of subjects who were to participate in the educational session were approached by the investigator for consent to participate in the study.

Subjects were required to be literate, oriented, and speak the English language in order to participate in the audiovisual patient education program, to refer to the patient manual, and to communicate with the investigator.

Geographical restrictions were necessary to permit follow-up visits in the subjects' homes.

Patient Education Program

The program in progress at the hospital consisted of seven slide-tapes and a take-home patient manual. The tapes and manual were produced by the American Heart Association and titled "An active partnership for the health of your heart (after your heart attack)". The slide-tapes imparted information to the patients about anatomy and physiology of the heart as related to coronary

artery disease, angina and myocardial infarctions, risk factors such as smoking, stress, diet, physical activity, and treatment, such as the ingestion of medication.

Because the outcome of the study measured compliance with dietary, activity, and medication health care recommendations, and because knowledge of the anatomy and physiology of the heart was essential for preparing the patient to understand the recommendations, discussion in the structured education sessions and follow-up interviews was limited to these four tapes. The duration of each tape was 20 to 25 minutes.

Content of the first tape included an explanation of the anatomy and physiology of the heart, defined a myocardial infarction, described the healing process of the heart after a myocardial infarction, described the cause of myocardial infarctions in the terms of coronary artery disease, and introduced the risk factors associated with heart disease.

The topic of the second tape was physical activity and content consisted of the rationale and directions for a gradual resumption of activities. Information concerning activities to do and not to do during the first three weeks at home were listed. Restricted activities such as sexual intercourse, driving a car, returning to a job, hobbies, and sports were addressed. Chest pains associated with exertion were also described with accompanying directions for treatment. The intended message of the tape was to limit physical activities during recovery with a gradual return to a similar

or better physical capability than experienced by the individual prior to the myocardial infarction.

The third tape introduced the patient to proper dietary habits. Diets low in calories, cholesterol, fat, and sodium were discussed. Foods to eat and foods to avoid were listed for each diet as well as general tips to assist the patient to follow each diet. The tape stressed moderation for particular food consumption rather than total elimination.

The topic of the fourth tape was medication. No specific drugs were described, however, the tape discussed general tips about the "do's" and "don'ts" of medication ingestion. The tape instructed the patient to question the name, purpose, method, frequency, dosage, and side effects for each medication prescribed.

A manual for home use was given to each patient. Content included the pertinent facts from the tapes and lists of dietary and activity restrictions.

Program Delivery on the Cardiac Ward. Within the time parameters of this study, two methods of program delivery were implemented by nursing staff. The delivery of the program by nursing staff was defined for the purpose of this study, as unstructured education by the investigator. The usual method was individual delivery; however, a group delivery method was put into practice for two months midway through the study. The methods of program delivery and the delivery variables are shown in Table One.

Table 1

Summary of Two Methods of Program Delivery on Cardiac Ward

Program Variables	Delivery Methods	
	Individual	Group
Content	1-7 tapes	7 tapes
Manuals	given	given
Significant other	if present	invited
Staff involvement	more than 1 nurse	nursing assistant more than 1 nurse
Discussion	possibly	possibly
Learning Objectives	none	none
Location	hospital room	patients' lounge
Time of day	usually day shift	afternoon and evening
Frequency	1-7 tapes shown over several days or all at once	1-2 per day
Sequenced	possibly	sequenced from Monday to Friday
Additional learning sources	possibly dietitian and medication cards	possibly dietitian and medication cards
Physician's written regimen	at discharge	at discharge

Several problems were identified with both methods from observation and comments from staff and patients who were involved with the unstructured teaching methods.

Problems encountered with the individual approach tended to be attributed to staff shortages and more than one nurse being responsible for the program. The presentation of the tapes usually occurred at the convenience of the nurse, resulting in the patient viewing all of the tapes during one session, more often than not. The tapes were usually shown during the day shift when more nursing staff were present; however, the significant others were frequently absent. The tapes were usually out of sequence and individual discussions were rare.

Problems encountered with the group method were poor attendance as a result of disinterest or conflict with tests and visitors, discharge before the entire program was presented, and lack of sequence to tapes if transfer to the cardiac ward occurred midweek. Patients complained that staff seldom arrived to turn on the equipment and that discussions with the nurse following the tapes were rare.

Prior to discharge, patients received medication cards describing each of their prescribed drugs. Content of the cards included the name, the purpose, tips for ingestion, and side effects. Some patients received the cards, some patients received the cards with a discussion with the nurse, and some patients did not receive the cards.

Patients with dietary restrictions received a visit from the dietitian prior to discharge. The dietitian distributed lists of "do's" and "don'ts" for each diet prescribed. If time permitted, the dietitian discussed the diets with patients and significant others, if the significant others were present during the visit. If the dietitian was busy, the patient was handed the lists of foods for each diet. If the latter situation occurred and the physician had prescribed more than one diet for the individual, the patient was responsible for eliminating conflicting foods that occurred between dietary overlaps.

At discharge, the patients were given a standard form by the cardiologist which listed the dietary restrictions, activity restrictions with dates specifying when to resume activities, a list of medications, and recommended times for follow-up appointments with the physician. The cardiologist attempted to discuss the form with both the patient and significant other.

Although the content and format of the program met the criteria for structured education, the unorganized and random delivery of the program constituted unstructured education. The end result was that some patients received the total program whereas other patients received parts or none of the services offered by the hospital.

Treatment

Variables to be manipulated were the method of patient education and the involvement of the significant other to determine their effects on compliance rates.

Patients who met the sample criteria were randomly assigned to one of three groups. Prior to the initiation of the study, twenty subject numbers were drawn from a hat and repeatedly assigned sequentially to the control group (1), the first experimental group (2), or to the second experimental group (3) until the subject numbers were eliminated. In other words, the first subject number drawn was assigned to group 1, the second to group 2, the third to group 3, the fourth to group 1, and so forth. Twenty subject numbers were drawn to cover possible attrition from the sample. Within the groups, the investigator introduced the following variables:

1. The control group received unstructured patient education as practiced by the nursing staff on the cardiac ward and described in the preceding section. The patient and possibly the significant other may have seen the slide-tape presentation, may have received discussions by nursing staff, may have discussed the prescribed diet with the dietitian, may have received the medication cards, may have received the manual, and may have watched the tapes on one day or over several days.

2. In the first experimental group, patients received structured education from the investigator. All subjects, without

their significant others in attendance, viewed four slide-tape presentations. The investigator may have been present for the first tape and was definitely present for the second, third and fourth tapes. The sequence of tapes was anatomy and physiology of the heart, physical activity, diet, and medication. Following each tape, the content and its relationship to lifestyle were discussed with the investigator guiding the discussion from structured teaching objectives (see Appendix A). The patient manual was given to each subject prior to the first tape and was referred to, by both subject and investigator, after each tape. Program times were arranged with the patient at his convenience, with the program being shown in the privacy of the patient's room. The door to the room was closed to reduce distractions. A maximum of two tapes were viewed each day as dictated by the patient's condition. The primary purpose for limiting the tapes to one or two per day was to prevent the patient from becoming overtired and clouding his ability to learn.

3. The second experimental group consisted of the patient and his significant other. The couple received structured education from the investigator and the investigator was present for all four tapes. The treatment was identical to that of group 2, with the only difference being the introduction of the significant other.

Limitations were associated with the timing of the structured patient education program. The program was conducted prior to discharge with final discharge instructions being unknown. As a

result, all diets were discussed as per learning objectives (see Appendix A), with a particular emphasis on the diet that the patient was being served during hospitalization. Current medications were discussed with relation to name and purpose of the drug. Patients were encouraged to question the physician or nurse about prescribed medication and to ask for medication cards on the day of discharge. Patients in the experimental groups also received visits from the dietitian if required and a discussion with the cardiologist prior to discharge as described for the control group.

This explanatory experimental study was designed to measure compliance rates of patients in the control group (group 1) who received unstructured patient education, patients in group 2 who received structured patient education, and patients in group 3 who received structured patient education with their significant other, to determine the effects of patient education methods and the effects of the significant other on compliance.

Data Collection Instrument

An interview schedule was chosen for this explanatory experimental study. Polit and Hungler (1978) recommended interviews to obtain self-report information from subjects in face-to-face situations for the research design used in this study.

The interview schedule contained some closed-ended questions which permitted subjects to select from a number of alternative responses and some open-ended questions to permit the respondents to reply to questions in their own words. The closed-ended questions measured the dependent variable of compliance rates and the open-ended questions encouraged the subjects to identify health care recommendations and to identify problems encountered and leading to noncompliance with the recommendations.

Development of the Data Collection Instrument. The dependent variable to be measured was defined as compliance rates with activity, dietary, and medication health care recommendations. Therefore, three general content areas of activity, diet, and medication were developed to measure the dependent variable. Specific content of each general content area was derived from the slide-tape presentations used in the education program. The data collection instrument is presented in Appendix C.

As previously discussed, the tape on activity suggested limiting physical activities for stair climbing, walking outdoors, lifting objects, sexual activity, return to work, hobbies or sports, travelling, and driving a car. The activity recommendations from the tapes also corresponded to activity categories on the discharge instruction form given to the patient by the cardiologist.

The dependent variable was measured by a multiple choice question with an ordinal scale. Subjects were asked if they

followed the activity recommendations all of the time, half the time, some of the time, or never. Numerical values were assigned to each answer choice. Since the desired behaviour was all of the time, this answer merited three points, the maximum points achievable. None of the time merited zero points. The use of this scale assisted the investigator to provide numerical data about compliance rates. Two "other" categories in the specific content area were included in the event that the physician prescribed additional limitations other than those defined. The closed-ended question using ordinal scaling permitted the summation of total compliance scores and comparison of the scores among subjects and groups using a percentage analysis.

The slide-tape on diet suggested foods to eat and avoid on diets low in calories, low in sodium, and low in fat/cholesterol. Reference was made to salt free diets and reducing alcohol consumption. Compliance rates were measured using the same format as described for activity recommendations with the best response being all of the time and being awarded three points. Two "other" categories were included in the event that the physician prescribed additional dietary limitations other than those defined.

The slide-tape on medication did not refer to specific drugs except for nitroglycerin. The tape encouraged patients to question health care workers about the name, purpose, method, frequency, dosage, and side effects for each medication prescribed. Commonly prescribed drugs such as nitroglycerin, digoxin, furosemide, and

potassium chloride were incorporated into categories with five "other" categories allocated to cover additional prescribed medications. Subjects were asked to estimate if they had been able to follow directions for each of the medications prescribed and responses were measured using the same format as described for activity recommendations. The best response of all of the time was awarded three points.

In order to measure compliance rates, subjects were asked open-ended questions to identify health care recommendations. Activity recommendations were determined by asking the subject if the doctor had suggested limiting activities in any way. Dietary recommendations were identified by asking the subject if the doctor had suggested restricting the diet in any way. Medication recommendations were determined by asking the subject if the doctor ordered any medication to take at home.

In order to obtain data about causes for noncompliance, subjects were asked if any difficulties were encountered with following the doctor's recommendations and to describe the difficulty. The open-ended question was asked for each activity, diet, and medication prescribed.

In addition, subjects were asked demographic data related to marital status, occupation, education, and previous myocardial infarction (see Appendix D).

Bille (1977) used a similar instrument to assess patient compliance in his study. Although he was able to draw conclusions

from assessments using the scale, no information was offered regarding validity or reliability.

Test of the Interview Guide. Content validity was accepted for the education program produced by the American Heart Association and titled, "An active partnership for the health of your heart (after your heart attack)". The first draft of the interview guide was critically discussed with experts in the areas of research and cardiovascular disorders resulting in minor changes being made to the guide. The instrument was pre-tested on one individual who received unstructured teaching with compliance being measured at one and three months following discharge from hospital. These checks supported the belief that the interview guide had content validity and was in a form that permitted responses from the subject.

Administration of Data Collection Instrument. The instrument was used for two interviews in the subjects' homes at one and at three to four months postdischarge (see Table 2). The instrument was completed by the investigator as directed by the subjects being interviewed. All responses were brief and were noted on the instrument. The subject was the focus of the interview. If the significant other was present, questions were directed to the subject and, if applicable, the subject would ask the significant other to respond.

One week prior to the scheduled interview time, the investigator telephoned the subject to arrange a convenient hour

Table 2

Number of Days between Discharge and Interviews

Subject	Number of Days	
	First Interview	Second Interview
1	29	105
2	30	107
3	35	89
4	32	101
5	35	82
6	25	68
7	30	71
8	34	94
9	33	97
10	31	86
11	30	87
12	32	77

for the interview. Holidays, appointments, previous commitments, and deaths within the family created discrepancies in the timing of the interviews.

General conversation between the investigator and subject and the significant other, if present, preceded data collection. The investigator always inquired about the general condition of the subject and the general value of the patient education program.

At the first interview, demographic data was obtained from the subject. The subject was asked to show the physician's instructions to the investigator and all subjects complied with this request. Subjects were reminded that all information would be kept confidential by the investigator and the purpose of this study was reintroduced.

The interview followed the sequence as outlined by the data collection instrument. Questions were asked about activity, diet and medication.

After the health care recommendations were identified, the investigator prompted a discussion concerning the content of each slide-tape and patient manual with regard to the particular health care recommendation. The purpose of the discussion was to remind the subject about content from the patient education program. Following the discussion, the investigator asked the closed-ended question concerning compliance with each subject choosing a response that best suited their compliance rate. The subject was then asked if any difficulties were encountered with following the

recommendation and to describe the difficulties. Each health care recommendation was pursued in this manner until data was collected for each general content area.

During the second interview, reference was made to health care recommendations identified during the first interview. The subject was asked if the recommendations continued to be reinforced by the physician, if the recommendations had changed, or if new recommendations were prescribed.

Ethics and Human Rights

Following acceptance of the research proposal by the University of British Columbia screening committee for research and other studies involving human subjects and by the research committee of the institution where the study was to be conducted, the investigator approached the head nurses of the coronary care unit and cardiac ward. The investigator was permitted access to the kardex and charting system to locate potential subjects with myocardial infarctions meeting specific criteria, and to obtain pertinent data about the subjects under study.

Subjects were approached by the investigator one to three days post transfer from the coronary care unit, with the assumption that the patient was in a stable condition. Following an introduction by the investigator and a statement of the general purpose of the visit, subjects were given an introductory letter explaining the purpose and activity of the study (see Appendices E, F, G).

Subjects were given fifteen minutes to read the letter without the investigator in attendance. Subjects who agreed to participate were asked to read and sign a consent form (see Appendix H). Written consent was received from subjects in groups 1 and 2. Written consent was obtained from subjects and their significant others in group 3. A total of three subjects refused to participate in the study.

A consent form was also signed by the attending cardiologist as part of the research protocol established by the hospital (see Appendix I).

Confidentiality was maintained by assigning each subject a number. The investigator had access to name, address and telephone number of the subjects to permit two home visits.

CHAPTER 4

Presentation and Discussion of Findings

The presentation and discussion of findings is presented in five sections beginning with a description of sample characteristics. Nonparametric statistical analyses of compliance scores will be presented next, followed by general observations of the total sample and by general observations regarding the role of the significant others. A summary will conclude the chapter.

Characteristics of the Sample

The sample consisted of 12 subjects who were randomly assigned to one of three methods of predischARGE education -- unstructured, structured, and structured with the significant other present. Content of the patient education sessions included anatomy and physiology of the heart, suggestions for medication-taking, and methods for management of risk factors related to diet and physical activity.

Sample characteristics are presented on the basis of age, employment, education, and history of previous myocardial infarctions (see Table 3). Random assignment to groups was done as the optimum way to equalize groups on characteristics that might influence compliance, independent of whether or not subjects received structured teaching. Because of the small group size, however, Table 3 suggests that groups were markedly unequal on the two demographic variables of age and employment.

Ages in group 1 ranged from 40 to 61 years with the median age being 51.5 years. Ages in group 2 ranged from 67 to 74 years with the median age being 69 years. Ages in group 3 ranged from 36 to 70 years with the median age being 54 years. The median ages of subjects in groups 1 and 3 were similar whereas subjects in group 2 tended to be older. Age characteristics in groups 1 and 3 were similar to mean ages from other studies investigating control and experimental groups with cardiac problems (Barbarowicz et al., 1980; Bracken et al., 1977; Scalzi et al., 1980). Similar studies using three-way-designs did not publish data concerning sampling characteristics; however, sample criteria consisted of subjects who were below the age of 65 years (Milazzo, 1980) and 70 years (Sivarajan et al., 1983).

All subjects in group 1 were employed whereas all subjects in group 2 were retired. In group 3, three subjects were employed with one subject being retired. Again, similarities of employment status were evident between groups 1 and 3. Few studies reported employment status as part of their sample characteristics (Barbarowicz et al., 1980; Bille, 1977; Scalzi et al., 1980). Bracken et al. (1977) reported that 23 of 31 subjects in the control group and 25 of 45 subjects in the experimental group were employed. In the present sample, 7 of 12 subjects were employed and 5 of 12 subjects were retired.

Education levels ranged from high school to university with no predominant patterns emerging between or among the groups. These

Table 3

Characteristics of the Sample Groups

Group	Subject	Age	Employment	Education	Previous Infarction
1	1	40	employed	university	Ø
1	2	52	employed	university	Ø
1	3	61	employed	university	Ø
1	5	51	employed	high school	Ø
2	6	67	retired	high school	1
2	8	70	retired	trade school	1
2	11	68	retired	college	Ø
2	12	74	retired	high school	Ø
3	4	56	employed	high school	Ø
3	7	70	retired	high school	2
3	9	52	employed	university	Ø
3	10	36	employed	university	Ø

sample characteristics are similar to characteristics from other studies (Barbarowicz et al., 1980; Bracken et al., 1977; Scalzi et al., 1980).

Three subjects in the sample had myocardial infarctions more than five years prior to the study. Two of these subjects were randomly assigned to group 2 and one was assigned to group 3. All other subjects were experiencing their first myocardial infarctions at the time the study was conducted. Similar studies that investigated cardiac problems used subjects who were experiencing their first myocardial infarction. Subjects with previous infarctions were eliminated from sample selection (Milazzo, 1980; Scalzi et al., 1980; Sivarajan et al., 1983).

Despite random allocation, sample characteristics of the three groups were unequal on the two demographic variables of age and employment which may have confounded findings of the study.

Nonparametric Statistical Analyses of Compliance Scores

To assess group differences, compliance scores with health care recommendations of physical activity, diet, and medication were subjected to the Kruskal-Wallis rank-sum test, a one-way analysis of variance test, for nonparametric data (Siegel, 1956; Wright, 1976). The level of statistical significance was set at $p < .05$.

A summary of H values using the Kruskal-Wallis rank-sum test with one-way analysis of variance on compliance scores is presented

in Table 4. Compliance with physical activity, dietary, and medication recommendations during both interviews were not statistically significant and the following hypotheses were rejected:

1. Myocardial infarction patients receiving structured education with the significant other will have higher rates of compliance with health care recommendations than myocardial infarction patients receiving structured education without their significant other.

2. Myocardial infarction patients receiving structured education with their significant other will have higher rates of compliance with health care recommendations than myocardial infarction patients receiving unstructured education.

3. Myocardial infarction patients receiving structured education will have higher rates of compliance than myocardial infarction patients receiving unstructured education.

Insignificant findings from this study are similar to the results obtained from other studies that investigated patient education formats for myocardial infarction patients and compliance with a therapeutic regimen (Bille, 1977; Scalzi et al., 1980; Silvarajan et al., 1983). Although Scalzi et al. (1980) reported statistically significant differences ($p < .05$) for knowledge and compliance with medication and physical activity recommendations, trends over time were not found to be significant.

Table 4

Summary of H. Values for Compliance with
Recommendations during two Interviews

Recommendations	Interview Schedule	H Values	Significance
Activity	1	2.67	NS
Activity	2	1.44	NS
Diet	1	1.87	NS
Diet	2	0.40	NS
Medication	1	3.39	NS
Medication	2	3.39	NS

^aH Values rounded to two decimal points.

The insignificant findings of this study need to be interpreted with caution because of the small sample size and between group differences.

General Observations of the Sample

Numerous observations were made of the total sample which suggested that compliance was related to individual differences. Raw data, number of recommendations, and compliance scores for physical activity recommendations during both interviews are presented in Tables 5 and 6, data related to dietary recommendations are presented in Tables 7 and 8, and data related to medication recommendations are presented in Table 9. The variability of compliance scores among individuals despite some form of patient education suggests that compliance was influenced by other factors. These factors will be discussed according to self-care abilities, self-care, and therapeutic demands as directed by the theoretical frameworks chosen to guide this study.

Self-care abilities. Bandura's (1977b) social learning theory suggested that individuals were motivated to learn as a result of their physiological state. Subjects in this study had altered physiological states caused by the myocardial infarction. Of the eight subjects who were approached to participate in structured patient education, five subjects were eager to learn about the disease and its treatment. One subject delayed discharge for a few hours until the last tape had been presented. The other three

Table 5

Raw Data, No. of Recommendations, and Scores for Compliance
with Physical Activity Recommendations during first interview

Group	Subject	Recommendations								Scores	
		Stairs	Lifting	Travel	Driving	Employment	Walking	Hobbies	Total A	Fractional	%
1	1	-	2	3	3	2	2	2	6	14/18	58
1	2	-	2	-	2	0	1	1	5	6/15	40
1	3	-	3	-	3	2	2	1	5	11/15	73
1	5	-	3	-	3	3	3	3	5	15/15	100
2	6	3	3	3	3	-	3	3	6	18/18	100
2	8	3	3	3	3	-	2	-	5	14/15	93
2	11	-	3	-	2	-	3	-	3	8/9	89
2	12	3	-	-	3	-	1	-	3	7/9	78
3	4	-	3	-	3	3	3	-	4	12/12	100
3	7	2	-	3	3	-	3	-	4	11/12	92
3	9	-	3	3	3	3	2	-	5	14/15	93
3	10	3	2	-	3	3	3	3	6	17/18	94

NOTE: All recommendation scores have a denominator of 3. A=no. of activity recommendations.

^apercentage scores rounded to nearest whole number.

Table 6

Raw Data, No. of Recommendations, and Scores for Compliance
with Physical Activity Recommendations during second interview

Group	Subject	Recommendations								Scores	
		Stairs	Lifting	Travel	Driving	Employment	Walking	Hobbies	Total A	Fractional	%
1	1	-	2	-	3	2	2	2	5	11/15	73
1	2	-	3	-	3	3	3	2	5	14/15	93
1	3	-	3	-	3	3	3	2	5	14/15	93
1	5	-	3	-	3	0	3	3	5	12/15	80
2	6	3	3	-	3	-	3	3	5	15/15	100
2	8	3	3	-	3	-	2	-	4	11/12	92
2	11	-	3	-	3	-	3	-	3	9/9	100
2	12	3	-	-	3	-	1	-	3	7/9	78
3	4	-	3	-	3	3	3	-	4	12/12	100
3	7	3	-	-	3	-	2	-	3	8/9	89
3	9	-	3	-	3	2	3	-	4	11/12	92
3	10	3	3	-	3	3	3	3	6	18/18	100

NOTE: All recommendation scores have a denominator of 3. A=no. of activity recommendations.

^apercentage scores rounded to nearest whole number.

Table 7

Raw Data, No. of Recommendations, and Scores for Compliance
with Dietary Recommendations during first interview

Group	Recommendations							Scores	
	Subject	Reducing	Low sodium	Salt free	Low fat/ Cholesterol	Alcohol	Other	Total R	Fractional %
1	1	-	2	-	1	2	-	3	5/9 56
1	2	-	2	-	2	0	-	3	4/9 44
1	3	-	1	-	3	-	-	2	4/6 67
1	5	3	-	-	3	3	-	3	9/9 100
2	6	-	-	-	3	3	-	2	6/6 100
2	8	-	-	3	2	-	-	2	5/6 83
2	11	-	3	-	3	3	3	4	12/12 100
2	12	-	3	-	-	-	2	2	5/6 83
3	4	3	3	-	3	2	-	4	11/12 92
3	7	-	3	-	2	3	-	3	8/9 89
3	9	1	-	-	2	-	-	2	3/6 50
3	10	3	-	-	2	3	-	3	8/9 89

NOTE: All recommendation scores have a denominator of 3.
R=no. of dietary recommendations.
^apercentage scores rounded to nearest whole number.

Table 8

Raw Data, No. of Recommendations, and Scores for Compliance
with Dietary Recommendations during second interview

Group	Subject	Recommendations					Scores		
		Reducing	Low sodium	Salt free	Low fat/ Cholesterol	Alcohol	Other	Total R	Fractional %
1	1	-	2	-	1	2	-	3	5/9
1	2	2	2	-	1	0	-	4	5/12
1	3	3	3	-	3	-	-	3	9/9
1	5	3	-	-	3	-	-	2	6/6
2	6	-	-	-	3	-	-	1	3/3
2	8	-	-	3	2	-	-	2	5/6
2	11	-	3	-	3	-	3	3	9/9
2	12	-	2	-	3	-	3	3	8/9
3	4	3	3	-	3	-	-	3	9/9
3	7	-	3	-	3	-	-	2	6/6
3	9	1	-	-	2	-	-	2	3/6
3	10	2	-	-	3	-	-	2	5/6
									100
									100
									50
									83

NOTE: All recommendation scores have a denominator of 3.

R=no. of dietary recommendations.

^apercentage scores rounded to nearest whole number.

Table 9

No. of Recommendations and Scores for Compliance with
Medication Recommendations during first and second interviews

Group	Subject	Total M	Fractional	%		Total M	Fractional	%
1	1	5	14/15	93		5	14/15	93
1	2	4	10/12	83		4	11/12	92
1	3	3	9/9	100		2	6/6	100
1	5	5	13/15	87		3	9/9	100
2	6	4	12/12	100		3	9/9	100
2	8	3	9/9	100		2	6/6	100
2	11	5	15/15	100		5	15/15	100
2	12	6	18/18	100		7	21/21	100
3	4	2	6/6	100		2	6/6	100
3	7	3	9/9	100		4	12/12	100
3	9	3	9/9	100		3	9/9	100
3	10	3	9/9	100		3	9/9	100

NOTE: M=no. of medication recommendations.
^apercentage scores rounded to nearest whole
number.

subjects were interested in the program, however, an eagerness to participate was not as evident. These observations suggest that patients are motivated to learn during their recovery on a cardiac ward following transfer from a coronary care unit. These findings also support Baden's (1972) recommendations that patient education on a cardiac ward is an ideal time for patient learning.

Although patient education was provided to enhance self-care abilities, education alone was not a valid predictor of compliant behaviour.

Orem (1980) identified education as a factor that influences an individual's ability to engage in self-care. When compliance scores with dietary recommendations during the first interview (see Table 7) were compared with the demographic variable of education, significant differences were obtained ($H = 5.95$, $df = 2$, $p < .05$). Scores were subjected to the Kruskal-Wallis rank-sum test with one-way analysis of variance (Siegel, 1956). The findings suggest that subjects with high school education had higher dietary compliance scores than did subjects with college and university preparation. Dubos (1965) identified education as a personal factor in defining one's state of health and Bandura (1977b) also recognized education as a personal stimulus for learning. Perhaps these findings suggest that individuals with lower educational preparation have less experience with decision-making and comply with recommendations more readily than do individuals with greater education. These findings are not supported by previous research.

Marston (1970) concluded from a review of the literature that education was not an influencing factor of compliance. These findings suggest that more research should be conducted to determine if education is a significant predictor of compliant behaviour.

Self-care. Orem (1980) defined self-care as, "the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being" (p. 35). Both Orem and Dubos (1965) supported the notion that individuals define their own health state. Observations from this study supported the idea that health definitions vary among individuals. For example, one subject, as a result of extraneous circumstances, was motivated by fear of death to attain a state of improved health and tended to comply with health care recommendations. Fear has been found to be a prime motivator for compliant behaviour (Crawshaw, 1974; Marston, 1970). At the other end of the spectrum, another subject defined his health state as happiness with living. He preferred to die happy; consequently, he refused to comply with recommendations that altered his lifestyle.

From general observations of the sample, subjects defined their own state of health, life, and well-being and subsequent compliance. Definitions of health and improved health, however, appeared to differ among health care workers and subjects. Health care workers tended to prescribe recommendations to improve the patients' health and expected compliant behaviour from subjects

without a prior consultation regarding health definitions. These observations suggest that personal definitions of health influence compliance and that health care workers should validate these definitions to enhance communication before implementing patient education on lifestyle changes. These findings also suggest that individualized nursing care plans may benefit the patient during his recovery.

Therapeutic demands. Orem (1980) identified therapeutic demands as personal needs that are altered as a result of the individual's state of health. Therapeutic demands for this study were interpreted as the recommendations prescribed by health care workers in the areas of physical activity, diet, and medication-taking for the purpose of satisfying the individual's altered needs resulting from a myocardial infarction. From observations of the sample, demands made of patients appeared to influence compliance.

Previous research has suggested that the number of recommendations prescribed had a negative effect on compliance (Ball, 1974; Marston, 1970); however, findings from this study found no relationship between compliance and the number of recommendations prescribed. When the number of recommendations for each category of physical activity, diet, and medication-taking over two interviews were subjected to the Kruskal-Wallis rank-sum test with one-way analysis of variance, significant differences at the $p < .05$ level were not obtained (Siegel, 1956). These findings

are possibly the result of the extent of behavioural changes that subjects were expected to make rather than to the number.

Individual behavioural changes were not measured in this study.

Subjects who identified their occupation as retired appeared to have few lifestyle changes to make with dietary and medication recommendations. Retired subjects in this study were older than 65 years and had experienced previous medical complications so specific characteristics influencing compliance cannot be ascertained. Three of five retired subjects had experienced previous myocardial infarctions and were following low sodium and/or low fat/cholesterol diets prior to their current hospital admission. Two of the other retired subjects had histories of renal disease or diabetes mellitus and appeared to have optimal compliance with special diets. All subjects in this study who were older than 65 years, retired, and had previous medical problems had developed daily medication schedules as a result of their conditions so few behavioural changes had to be implemented. Bille (1977) also found that retired subjects had relatively few factors interfering with compliance with health care recommendations. These findings suggest that older retired subjects with previous medical problems had few behavioural changes to make with dietary and medication recommendations and that health care workers should assess the extent of changes that affect each individual and take this into consideration when planning care.

In addition to the extent of behavioural changes required, simultaneous changes appeared to affect dietary compliance scores. Six subjects were advised to follow reducing diets by the second interview (see Table 8). Three of these subjects did not comply all of the time and ate foods that were high in calories and contraindicated in their diet. The most frequent source of difficulty for noncompliance with reducing diet recommendations was attributed to cessation of cigarette smoking. Two of the three subjects who did not comply all of the time felt that smoking had more detrimental effects on their hearts than obesity and continued to eat foods that were high in calories. These findings suggest that when simultaneous demands are made of an individual, decision-making occurs and the predominant tendency is to comply with one demand. These findings are supported by similar research results reported by Marston (1970).

The event of a myocardial infarction placed demands on all employed subjects. During the first interview, subjects were advised to rest at home and avoid their place of employment. By the second interview, six of the seven employed subjects were advised to return to work via part-time employment; however, differences were noted for employment resumption between professional and nonprofessional subjects. Four of the six subjects who identified their occupation as educators, engineers, and managers easily resumed employment via part-time positions. Two subjects who performed skilled and unskilled labour had to

resume full-time employment in order to keep their jobs with their companies. Part-time employment was not company policy. Both subjects expressed fear during the first interview and felt that heavy labour would induce another myocardial infarction. By the second interview, physicians had advised both of these subjects that they could resume full-time employment since part-time employment was not feasible. One subject complied despite his fears; however, the other subject preferred not to resume employment and continued on sick leave. These findings support those reported by Crawshaw (1974) and Tyzenhouse (1973) who found that individuals who performed manual labour encountered more difficulties with resumption of employment than individuals who performed professional tasks.

Eight subjects were advised by their physicians that they could resume sexual activity within two to three weeks following discharge from hospital. The recommendation merely served as a guideline rather than a compliance item and provided information to subjects to allay apprehension. Variables influencing the resumption of sexual activity were not investigated. Although data related to these recommendations were excluded from total scores, it was interesting to note that one subject followed the guidelines and had resumed sexual activity, one subject resumed the activity on the day of discharge from the hospital, and six subjects had not resumed the activity by the first interview. By the second interview, all subjects but two had resumed sexual activity. Fear

of a recurrent myocardial infarction and medical complications were cited as reasons for not resuming sexual activity.

From general observations of the sample, individual differences were noted that had an influencing effect on compliance. Individuals tended to define their own state of health which influenced whether or not they would comply with the therapeutic regimen. The extent of behavioural changes recommended, simultaneous recommendations prescribed, the variable of education, and demands for resumption of employment affected individual's responses to therapeutic demands and influenced compliance.

General Observations of Significant Others

Bandura's (1977b) social learning theory and Dubos' (1965) theory of adaptation recognized the significant other as a stimulus for reinforcement and support to an individual recovering from a myocardial infarction. Although only four significant others were invited to participate in patient education sessions, general observations were made of nine significant others who participated in both interviews in their homes.

With reference to physical activity recommendations, all nine significant others assumed lifting and driving chores when able, five joined their mates for daily walks, and three participated in their mate's hobbies/sports.

With reference to dietary recommendations, all nine

significant others purchased and prepared food, all nine used the take-home manual as a dietary guide, and six used additional cooking resources. One significant other had her mate's diet analyzed by computer to detect flaws with recommended food consumption and another marked meals on a calendar in an effort to eliminate contraindicated foods from the prescribed diet.

With reference to medication recommendations, five significant others reminded their mates to take medication and two of these five significant others placed daily pills in a dish and checked the dish at bedtime to assure that medications were taken by their mates.

Although significant others' behaviours were not the focus of this study, general observations of nine of the significant others suggest that these women were actively involved with and supported and reinforced their mates' therapeutic regimens. These findings support those reported by Mayou et al. (1978) where half of the women in the sample participated or encouraged their husbands to comply with health care recommendations.

Summary

Despite random allocation of subjects to three different groups, the groups were markedly unequal on the two demographic variables of age and employment. Statistically significant results were not obtained for compliance between groups with physical activity, dietary, and medication recommendations and the

hypotheses of the study were rejected. Insignificant findings are possibly the result of a small sample size thus inferences drawn from the statistical analyses may be questionable.

General observations of the total sample suggested that individual differences influence compliance. Health care workers should be aware of the patient's definition of health, the extent of and simultaneous behavioural changes affecting each patient, and the demographic variables of education and employment in order to provide quality of care to patients and enhance individual compliance. Findings also suggest that the significant others participate with and encourage their mates to comply with a therapeutic regimen.

CHAPTER 5

Summary, Conclusions, Implications, and Recommendations

This study was designed to explore the independent variables of patient education and the significant other on compliance. An overview of the study is presented in this chapter followed by a conclusion. In addition, implications and recommendations for nursing practice and nursing research are delineated.

Overview of the Study

A summary of the study will be described in relation to problem, design, implementation, and results.

Problem, design, and implementation. An explanatory experimental study was conducted to investigate the effects of structured education for the patient, and the significant other, on compliance with health care recommendations for patients recovering from a myocardial infarction after discharge from hospital.

The theoretical framework of the study was a combination of Orem's model for nursing, Dubos' theory of adaptation, and Bandura's social learning theory. The framework predicted that subjects receiving structured education with their significant others, would have higher compliance rates with health care recommendations than would subjects receiving structured education alone and unstructured education alone.

The study was conducted with a convenience sample of twelve male patients who were admitted to a cardiac ward of one

metropolitan teaching hospital. Subjects had a significant other and had not experienced a myocardial infarction within the previous five years. Four significant others participated in the study. Agreement was obtained from the attending cardiologist and consent was given by each subject, and the four significant others, prior to study participation.

The convenience sample was then randomly and equally allocated into three groups. Subjects in group 1 served as the control group and received unstructured education as currently practiced by nursing staff. Subjects in group 2 received structured education by the investigator. Subjects in group 3 received structured education by the investigator with their significant others in attendance.

Using a semi-structured interview guide with some open and some closed-ended questions, the investigator interviewed each subject twice in their home at approximately one, and three to four months following discharge from hospital. Each interview covered three content areas: physical activity, diet, and medications. Open-ended questions were used to elicit data on the health care recommendations prescribed by the physician and to obtain data concerning difficulties with noncompliance. Closed-ended questions were used to estimate the subject's compliance using an ordinal scale. Responses were later tabulated and converted to numerical percentage scores.

Results. Compliance scores with health care recommendations of physical activity, diet, and medication were subjected to the Kruskal-Wallis rank-sum test with one-way analysis of variance. Compliance scores during both interviews showed no between group statistically significant differences ($p < .05$) and the hypotheses of the study were rejected. The insignificant findings of this study need to be interpreted with caution because of the small sample size and between group differences on the two demographic variables of age and employment.

Although patient education was provided to enhance self-care abilities, education alone was not a valid predictor of compliant behaviour. The variability of compliance scores with health care recommendations suggested that compliance was influenced by other factors.

From general observations of the total sample, it appeared that subjects' definitions of health varied and that these personal definitions of health influenced compliant or noncompliant behaviour with the therapeutic regimen prescribed. The findings suggest that validation of patients' definitions of health be done by health care workers prior to the implementation of patient education on lifestyle changes to enhance communication and to establish mutual goals.

Subjects in this study were motivated to learn about their disease and its treatment during their recovery on the cardiac ward following discharge from the coronary care unit, and these findings

suggest that patient education on a cardiac ward is an ideal time for learning to begin. During both interviews in the home environment, subjects asked numerous questions about their therapeutic regimen perhaps suggesting that additional learning resources are required following discharge from hospital.

Data from this study showed that subjects with high school education had higher compliance scores with dietary recommendations during the first interview than did subjects with college or university preparation ($H = 5.95$, $df = 2$, $p < .05$). Scores were subjected to the Kruskal-Wallis rank-sum test with one-way analysis of variance. These findings suggest that subjects with lower educational preparation have less experience with decision-making and comply more readily with dietary recommendations than do subjects with higher educational preparation. These results are not supported by previous research perhaps suggesting that more studies be conducted to determine if education is a significant predictor of compliance.

Simultaneous demands and the extent of behavioural changes expected by health care workers of the subjects appeared to influence compliance in this study. Some subjects were requested to modify smoking habits and their consumption of high caloric foods; however, subjects had difficulty complying with both recommendations. Subjects felt that smoking had more detrimental effects on their heart than obesity and decided to quit smoking and modify but not eliminate their consumption of high caloric foods.

All subjects in this study who identified their occupation as retired were older than 65 years and had experienced previous medical problems. These subjects encountered few lifestyle changes with dietary and medication recommendations and subsequent compliance. Findings suggest that nurses should assess simultaneous demands being made of the patient and the extent of behavioural changes that affect each individual, and take these individual differences and potential effects into account when planning nursing care.

Differences were observed between professional and nonprofessional subjects and their ease of transition into the work force. All subjects in this study who identified their occupations as professionals, resumed employment via part-time positions. All subjects who identified their occupations as nonprofessionals had to resume full-time positions in order to maintain their jobs. For the latter subjects, part-time employment was not considered part of company policy. Fear of recurrent myocardial infarctions induced by heavy labour was expressed by these subjects. These findings suggest that individuals who perform nonprofessional tasks encounter more difficulties with resumption of employment than do patients who perform professional tasks, and that early identification of these factors by health care workers might help to ease the patient's transition back into the work force.

From observations of nine significant others, all were actively involved with physical activity, dietary, and medication

recommendations that were prescribed for their mates. These findings suggest that knowledge about the therapeutic regimen be given to significant others by health care workers to enable these women to provide support and reinforcement to their partners during their recovery at home.

Conclusions

This study investigated the effects of structured education for the patient, and the significant other, on compliance with health care recommendations for patients recovering from a myocardial infarction after discharge from hospital. Significant differences were not found possibly as a result of the small sample size and between group differences of the two demographic variables of age and employment. Patient education was not found to be a valid predictor of compliant behaviour.

From general observations of the total sample, numerous factors were identified that influenced compliance. These factors were personal definitions of health, simultaneous demands and the extent of behavioural changes required, and the demographic variables of education and employment. Findings also suggested that the significant others of patients were actively involved with the therapeutic regimen prescribed for their mates.

Implications

Nursing practice. Nurses are the primary health care professionals who teach patients with myocardial infarctions about their disease and treatment. The nurse can perform a critical role in enhancing patient compliance with health care recommendations. This study, therefore, holds some important implications for nursing practice:

1. A cardiac ward following discharge from a coronary care unit and the home environment are suitable settings for patient education. During these stages of their recovery, patients are motivated to learn about the disease process and its management.

2. Since definitions of health varied among subjects in this study, nurses could investigate patient definitions to enhance communication and validate goals.

3. Since subjects with nonprofessional occupations encountered difficulties with their resumption of employment, nurses should assess their patient's occupation and assist his transition back into the work force.

4. Nursing assessment of patients should include the extent of behavioural changes and simultaneous demands expected of the patient, and should take these individual differences and potential effects into account when planning nursing care.

5. Since significant others were actively involved with their mates' therapeutic regimen, patient education in the areas of

physical activity, diet, and medication-taking should be given to significant others by health care professionals.

Nursing research. As previously stated, this was an explanatory experimental study conducted in one setting with a small convenience sample. Insignificant findings were possibly the result of the small sample size and between group differences of the variables of age and employment. Findings cannot be generalized beyond the study population. Implications for nursing research include:

1. Further investigation of the independent variables of method of patient education and influence of the significant other on compliance using a larger sample population. Using instruments to measure knowledge levels of the patients and their significant others at various intervals during the recovery process might help to determine the effectiveness of patient education. Similarly, using instruments to measure behavioural changes may reflect more accurate compliant behaviours with health care recommendations.

2. Further investigation of the possible relationship of educational preparation to decision-making relative to dietary compliance.

3. Investigation of resumption of employment between professional and nonprofessional occupations since findings from this study suggested that individuals with nonprofessional occupations encountered more difficulties with employment resumption than did subjects who performed professional tasks.

Recommendations

On the basis of the findings and implications of this study, it is recommended that:

1. Nursing assessment include the patient's definition of health, occupation, simultaneous demands being made of the patient, and the extent of behavioural changes expected to enhance communication, clarify goals, and to individualize patient education.

2. Significant others of patients with myocardial infarctions be provided with knowledge in the areas of physical activity, diet, and medication-taking so that they may be able to assist their mates during the recovery process.

3. Nurses enhance collaborative efforts with physicians to determine dietary and medication health care recommendations prior to discharge. Early identification of these discharge instructions would permit the nurse to discuss tentative plans with the patient and help tailor the care plan to reflect patient needs.

4. Future studies investigating patient education and compliance employ tools to measure knowledge levels and behavioural changes at various stages of the recovery process.

5. The demographic variables of educational preparation and occupation be investigated further to determine if these variables are valid predictors of compliant behaviour.

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Appendix A

Structured Patient Education Objectives

The purpose of the teaching sessions is to review and to individualize slide/tape content. The objectives were developed by the investigator based on content from the program entitled "An active partnership for the health of your heart (after your heart attack)" and produced by the American Heart Association.

Tape 1: Your Heart Attack and Your Future

1. To know the cause, effects, and risk factors of a heart attack.
 - a) to identify the function of the heart.
 - b) to identify the function of the coronary arteries.
 - c) to describe the damage done to the heart during a heart attack.
 - d) to describe the recovery process of the heart after a heart attack.
 - e) to identify time parameters associated with the heart's recovery post-attack.
 - f) to identify the cause of a heart attack.
 - g) to list four risk factors that influence coronary artery disease.
 - h) to identify risk factors that affect this individual.

Tape 2: Move Into Action

1. To know specific facts about the effect of physical activity on the heart after a heart attack.
 - a) to identify the purpose of collateral circulation.
 - b) to explain the rationale for a gradual increase in activities as it affects the heart.
 - c) to list 5 activities that can be performed during the first 3 weeks at home.
 - d) to list 4 activities that should be avoided during the first 3 weeks at home.
 - e) to identify current activities enjoyed.
 - f) to compare activities currently enjoyed to the list of activities to do and not to do that affect an individual recovering from a heart attack.
 - g) to discuss methods to adhere to the list of physical activities to do and not to do during recovery.
 - h) to identify the time period associated with restricted driving following a heart attack according to the laws of B.C.
 - i) to identify other sources of transportation allowed during the driving restriction.
 - j) to identify activity expenditure involved in sexual intercourse.

- k) to identify personal guidelines when resuming sexual intercourse.
- l) to list 3 warning signs indicating to stop activity and rest.
- m) to identify physical activity limitations affecting current occupation.

Tape 3: You Are What You Eat

1. To know specific facts about a low cholesterol/low fat diet.
 - a) to define cholesterol.
 - b) to define saturated fat.
 - c) to define polyunsaturated fat.
 - d) to define the collective effects of cholesterol/fat on the arteries of the body.
 - e) to identify the rationale for avoiding foods high in cholesterol/fat.
 - f) to list 6 food items to eat when on a low cholesterol/fat diet.
 - g) to list 6 food items to avoid when on a low cholesterol/fat diet.
 - h) to identify food items high in cholesterol/fat consumed with current diet.
 - i) to identify satisfactory food items that can be substituted for those items high in cholesterol/fat.
 - j) to discuss the relevance of low cholesterol/fat food items to the individual who procures and prepares meals in the home.
2. To know specific facts about a low sodium diet.
 - a) to identify the effect of sodium/salt on the body.
 - b) to identify the effect of sodium/salt on the heart after a heart attack.
 - c) to list 6 food items high in sodium content.
 - d) to identify food items in the current diet that are high in sodium content.
 - e) to identify satisfactory food items that can be substituted for those items high in sodium content.
 - f) to discuss the relevance of low sodium food items to the individual who procures and prepares meals in the home.
3. To know methods to lose weight.
 - a) to identify two methods to lose weight.

Tape 4: Your Prescription for Health

1. To know specific facts about the taking of medications in the home.
 - a) to identify factors that will promote a satisfactory routine to take medications in the home.
 - b) to identify detrimental factors affecting the taking of medications in the home.
 - c) to identify the rationale for knowing the name of the medication.
 - d) to identify the rationale for knowing the purpose of the medication.
 - e) to identify the rationale for knowing the dosage and frequency of medication.
 - f) to identify the rationale for knowing the side effects of medication.
 - g) to list the name, and purpose of current medication.

Appendix B

Discharge Guidelines of Cardiac Teaching Unit
(Guidelines from the institution under study with their approval)

Diet

Type:

Alcohol Restrictions:Activities:

Your strength and energy will gradually return but may take up to 3 months. A useful guideline to assist you in returning to your normal activities would be:

Week 1 - Stay indoors - carry on the same level of activity reached in hospital. If the weather is agreeable, you may sit out of doors in the garden or on the patio. Rise at your usual time in the morning, dress and be up most of the day. Lie down half an hour after each meal and when you are tired. Try to do a little more each day. If you experience chest pain, lie down until the pain disappears.

Stair Climbing: Yes ____ No ____

Restrictions: _____

Week 2 - Begin outdoor walking.

Day ____ Walk one city block and back.
Day ____ Walk two city blocks and back.
Day ____ Walk three city blocks and back.

Increase a city block daily until you are walking eight city blocks and back. Thereafter, walk one mile or more daily, at whatever pace suits you. You may walk up hills and slopes.

Call your doctor, or go to your local Emergency Department if you develop chest pain and it is not relieved after taking 3 or 4 nitroglycerine tablets (one every 5 minutes), or, if the pain does not go away with rest within 20 minutes.

Home Activity Suggestions:

1. Fix light lunches
2. Be alone during the day

Weeks	1	2	3	4

	Weeks	1	2	3	4
3. Be a passenger in a car					
4. Resume sexual relationships					
5. Take a holiday - driving - flying					
6. Resume light housework (dusting, cooking, washing dishes)					
7. Resume heavy housework (vacuuming, laundry, floors)					

Driving:

The B.C. Motor Vehicle Act prohibits you from driving your car for 6 weeks after a heart attack.

Approximate return to work: _____ weeks.

Follow-up Visits:

Family Doctor:

Cardiologist:

Other:

Medications: List below

Restrictions:

Definitely NO CIGARETTE SMOKING. It increases the risk of heart disease.

ATTACH MEDICATION TEACHING CARDS BELOW:

Appendix C

Data Collection Instrument

Pt. Number _____
 Date _____
 Interview _____

A. Physical Activity

- a) Did your doctor suggest that you limit your activity in any way, i.e.:

Climbing stairs _____
 Walking outdoors _____
 Lifting objects _____
 Resumption of sexual activity _____
 Return to work _____
 Hobbies or sports _____
 Driving a car _____
 Other _____
 Other _____

- b) Would you estimate that you have been able to follow these suggestions:

<u>Climbing Stairs</u>	<u>Walking Outdoors</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Lifting Objects</u>	<u>Resumption of Sexual Activity</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Return to Work</u>	<u>Hobbies or sports</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Travel</u>	<u>Driving a car</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never

Other

____ (3) all the time
 ____ (2) about half the time
 ____ (1) some of the time
 ____ (0) never

Other

____ (3) all the time
 ____ (2) about half the time
 ____ (1) some of the time
 ____ (0) never

- c) If you have had difficulty following the doctor's suggestions, can you give a reason? Why?

Climbing stairs:

Walking outdoors:

Lifting objects:

Resumption of sexual activity:

Return to Work:

Hobbies or sports:

Travel:

Driving a car:

Other:

Other:

Score ____/100%

B. Diet

- a) Did the doctor suggest that you restrict your diet in any way, i.e.:

Reducing diet to lose weight _____
 Salt free _____
 Low sodium _____
 Low fat/cholesterol _____
 Alcohol _____
 Other _____
 Other _____

- b) Would you estimate that you have been able to follow these suggestions:

<u>Reducing Diet</u>	<u>Salt free</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never

<u>Low sodium</u>	<u>Low fat/cholesterol</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never

<u>Alcohol</u>	<u>Other</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never

Other
 _____ (3) all the time
 _____ (2) about half the time
 _____ (1) some of the time
 _____ (0) never

- c) If you have had difficulty following the doctor's suggestions, can you give a reason? Why?

Reducing diet:
 Salt free
 Low sodium:
 Low fat/cholesterol:
 Alcohol:
 Other:
 Other:

Score ____/100%

C. Medication

- a) Did your doctor order any medication for you to take at home? i.e.:

Nitroglycerine _____	How often _____
Digoxin _____	How often _____
Furosemide _____	How often _____
Potassium Chloride _____	How often _____
Other _____	How often _____
Other _____	How often _____
Other _____	How often _____
Other _____	How often _____
Other _____	How often _____

- b) Would you estimate that you have been able to follow these directions:

<u>Nitroglycerine</u>	<u>Digoxin</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Furosemide</u>	<u>Potassium Chloride</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Other</u>	<u>Other</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Other</u>	<u>Other</u>
_____ (3) all the time	_____ (3) all the time
_____ (2) about half the time	_____ (2) about half the time
_____ (1) some of the time	_____ (1) some of the time
_____ (0) never	_____ (0) never
<u>Other</u>	
_____ (3) all the time	
_____ (2) about half the time	
_____ (1) some of the time	
_____ (0) never	

- c) If you have had difficulty following the doctor's suggestions, can you give a reason? Why?

Nitroglycerine:

Digoxin:

Furosemide:

Potassium Chloride:

Other:

Other:

Other:

Other:

Other:

Score ____/100%

Note. Questionnaire to be completed by the investigator.

Appendix D

Demographic Data

Subject Number:

Address:

Phone Number:

Age:

Marital Status:

Occupation:

Education:

Previous myocardial infarctions:

Presence of spouse during slide-tape presentations:

Activity -

Diet -

Medication -

Group Designation:

Appendix E

Group 1 Introductory Letter

Dear

This letter is to ask you to participate in a study which I am doing as a student at the University of British Columbia, taking my Masters in Nursing. Although nursing and medical staff have helped me to contact you, I do not work on this nursing unit.

I am interested in the format of health teaching given to clients such as yourself and your response to the teaching method after discharge from hospital.

During your hospitalization, nursing staff will share slide-tape presentations with you about recovering from a heart attack. If you are willing to participate in the study, I would like to meet with you twice at your residence, the first time being one month after discharge from hospital and again three months after discharge. Interview time at your residence will take approximately 30 minutes of your time.

You are free to withdraw from the study at any time. You will not be identified by name in the study.

If you are willing to participate in the study, I will meet with you prior to discharge to introduce myself and to answer any questions that you may have about the study at that time. After discharge, I will contact you by phone, three weeks later to arrange an interview time.

If you decide not to participate, your decision will not affect your contact or care with the hospital staff in any way. If you decide to participate, you will be informed of the final results of the study if desired.

Sincerely yours,

Rhonda Kirk

Appendix F

Group 2 Introductory Letter

Dear

This letter is to ask you to participate in a study which I am doing as a student at the University of British Columbia, taking my Masters in Nursing. Although nursing and medical staff have helped me to contact you, I do not work on this nursing unit.

I am interested in the format of health teaching given to clients such as yourself and your response to the teaching method after discharge from hospital.

If you are willing to participate in the study, I will watch and discuss three slide-tape presentations about recovering from a heart attack with you during your hospitalization. I would like to meet with you twice at your residence, the first time being one month after discharge from hospital and again three months after discharge. Interview time at your residence will take approximately 30 minutes of your time.

You are free to withdraw from the study at any time. You will not be identified by name in the study.

If you are willing to participate in the study, I will meet with you to review the slide-tape presentation and then will contact you by phone three weeks after discharge to arrange an interview time.

If you decide not to participate, your decision will not affect your contact or care with the hospital staff in any way. If you decide to participate, you will be informed of the final results of the study if desired.

Sincerely yours,

Rhonda Kirk

Appendix G

Group 3 Introductory Letter

Dear

This letter is to ask you and your wife to participate in a study which I am doing as a student at the University of British Columbia, taking my Masters in Nursing. Although nursing and medical staff have helped me to contact you, I do not work on this nursing unit.

I am interested in the format of health teaching given to clients such as yourself and your response to the teaching method after discharge from hospital.

If you are willing to participate in the study, I will watch and discuss three slide-tape presentations about recovering from a heart attack with you and your wife during your hospitalization. I would like to meet with you twice at your residence, the first time being one month after discharge from hospital and again three months after discharge. Interview time at your residence will take approximately 30 minutes of your time.

You are free to withdraw from the study at any time. You will not be identified by name in the study.

If you and your wife are willing to participate in the study, I will meet with you to arrange a convenient time to review the slide-tape presentations and then will contact you by phone three weeks after discharge to arrange an interview time.

If you decide not to participate, your decision will not affect your contact or care with the hospital staff in any way. If you decide to participate, you will be informed of the final results of the study if desired.

Sincerely yours,

Rhonda Kirk

Appendix H

Patient Consent Form

I, _____, do hereby give my consent to participate in the study on client responses to teaching format which is being conducted by Rhonda Kirk, a graduate student in the School of Nursing at the University of British Columbia.

- I understand a) that participation in the study involves no risks or discomforts.
- b) that my participation is voluntary and that I may withdraw at any time.
- c) that refusal to participate in the study or withdrawal from the study will in no way interfere with the medical or nursing care which I will receive, and
- d) that any information personally identifying me as a participant in this study will remain strictly confidential.

Signature of Client

Date

Signature of Witness

Signature of Other

Appendix I

Physician Consent Form

I, _____, do hereby give my permission to have _____, a patient under my care, participate in the study on patient response to the cardiac teaching format which is being conducted by Rhonda Kirk, a student in the Master of Science in Nursing program at the University of British Columbia.

Signature of Physician

Date