# EFFECT OF CONCURRENT CHEST PAIN ASSESSMENT ON RETROSPECTIVE REPORTS BY CARDIAC PATIENTS

Masters Research Project

by

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# CHAPTER 1

# INTRODUCTION

## Statement of Problem

Assessment and management of pain can be a challenging clinical problem for nurses. Assessment of pain is especially difficult when done on a subjective retrospective basis, as commonly occurs in outpatient settings and during hospital admission procedures. The accuracy of retrospective recall of pain may be adversely affected by time and patients' memories. Patients are asked to remember events surrounding the pain as well as its characteristics and intensity. They also must remember what was done to alleviate it. Concurrent pain assessment, done while the event is happening, can prevent the discrepancies caused by time and memory. The availability of previously recorded concurrent assessments of pain should enhance the completeness and accuracy of data received from patients in health care settings.

Data from a patient history is the starting point for assessment of pain by nurses and the beginning basis for nursing interventions. The ability of patients to describe and characterize their pain influences diagnostic and therapeutic decisions. For proper intervention, therefore, it is imperative that information gathered be as accurate and complete as possible.

Chest pain is the primary presenting symptom of ischemic cardiac disease, which is the leading cause of death

and disability in the United States. Five million people have a history of heart attacks and/or angina pectoris. In 1990, the estimated health care cost of cardiovascular disease is over 94 billion dollars (Heart and Stroke Facts, 1990). The symptom of chest pain can also be from noncardiac causes, and differentiation of pain etiology partly depends on subjective verbal pain reports.

Along with the benefit of proper evaluation and initiation of correct interventions, concurrent assessment of chest pain episodes would be useful for self-care agency, which is the ability of an individual to engage in the activities necessary for his own self-care. The education of cardiac patients by nurses includes teaching them to recognize and report pain episodes as well as what to do when they are experiencing pain. If concurrent pain data are available, evaluation of patients' ability for self-assessment and self-care would be improved. Concurrent data would provide insight into the context of pain episodes while patients are in the home setting pursuing normal activities and insight into the coping and judgment abilities of the patients. This self assessment may provide the impetus for accessing the health care system in a timely manner, thus preventing a delay in seeking treatment.

Retrospective pain reports are likely to differ from information that is gathered while the pain is happening. It is useful to ascertain which pain characteristics are able to be recalled completely and accurately and which are difficult for the patient to recall.

Purposes of the Study

The first purpose of this study was to determine whether or not subjects with cardiac pain who kept a concurrent chest pain diary improved the completeness of their retrospective pain reports compared to the retrospective reports of subjects who did not keep a concurrent diary. The specific study question related to this purpose was whether the subjects were able to describe their chest pain along eight dimensions: frequency, activity, mood, duration, intensity, descriptors, location, and treatment.

The second purpose was to determine whether or not subjects who kept a concurrent diary provided accurate retrospective reports of their chest pain when compared to the concurrent chest pain data. The study question related to this purpose was whether subjects reported similar content in all the categories both concurrently and retrospectively.

The third purpose was to determine whether subjects who did not keep a concurrent diary were able to accurately recall characteristics of a chest pain episode, assuming that their pain experience was equivalent to that of the subjects who kept a diary. The study question related to this purpose was whether subjects who did not keep a diary recalled the quantitative characteristics of pain frequency, intensity, and duration accurately. If data from these subjects differed significantly from the diary, it would suggest that their pain recall was inaccurate.

# REVIEW OF LITERATURE

This chapter will review the literature about chest pain, the etiology of cardiac pain, and memory and recall of pain. The chapter also includes a description of Orem's theory of self-care, the conceptual framework for the study.

## Chest Pain

Chest pain is the predominant presenting symptom of ischemic heart disease, representing insufficient oxygen delivery to an area of the heart. In the normal myocardium, the balance between myocardial oxygen supply and demand is met primarily through changes in coronary blood flow. In response to increased demand, adequate tissue oxygenation is maintained by appropriate increases in coronary flow. Classic, or exertional, angina pectoris is chest pain that occurs when increased myocardial oxygen demand cannot be matched by increased oxygen supply because of atherosclerotic obstruction that limits ability of the coronary arteries to dilate and increase flow (Hillis, Firth, & Willerson, 1984). Variant, or Prinzmetal's, angina is caused by coronary artery spasm that results in vasoconstriction of the coronary vessels, leading to transient reduction in blood flow (Cohn & Braunwald, 1988). Nontransient ischemia, resulting in myocardial necrosis, is termed myocardial infarction.

The typical presentation of angina pectoris was first described in 1772 by Dr. William Heberden as conveying a

sense of strangling and anxiety. Common descriptors currently used are a constricting, squeezing, or crushing character, often associated with anxiety and a sense of impending doom. Angina is sometimes described as a pressure or dull ache instead of pain (Hillis, Firth, & Willerson, 1984).

Exertional angina is induced by effort and often maintains the same intensity while present. When angina is due to fixed coronary obstruction, the same degree of activity tends to reliably reproduce the pain. In contrast, when angina is due to coronary artery spasm with or without fixed obstruction, the level of activity that causes pain may vary (Hurst & Logue, 1966). Nonphysical activities such as exposure to cold, mental stress, and smoking can also cause angina (Deanfield & Selwyn, 1986). The location of the pain is commonly substernal, or precordial. About half of patients with angina have radiation to other parts of the body, most commonly to the left shoulder and down the ulnar surface of the left arm, but occasionally to the right arm or to portions of the chest, jaw, or back. The duration of the pain is typically no longer than 3-5 minutes. Angina is occasionally accompanied by dyspnea, diaphoresis, or nausea. Relief by sublingual nitroglycerin should be rapid and complete, although at times a residual hyperesthesia of the anterior chest occurs. Sometimes the pain can be relieved by rest alone.

As cardiac disease progresses, anginal pain may change from a stable predictable pattern to "unstable angina," presenting even at rest with inconsistent relief (Hillis, Firth, &

Willerson, 1984). Pain of a prolonged duration (greater than 20-30 minutes) suggests either myocardial infarction or a noncardiac cause.

Atypical presentations of cardiac pain are presumed to be caused by the referral of pain over accessory afferent nerve pathways into levels of the spinal cord not usually involved in chest pain. Atypical cardiac pain may be characterized as a burning sensation or indigestion (Silber, 1987).

Anginal chest pain must also be differentiated from a wide range of pain due to other causes. Nonischemic causes of chest pain include pericarditis, dissecting aortic aneurysm, pulmonary embolus, pleurisy, pneumothorax, bronchogenic carcinoma, cervical intervertebral disc disease, intercostal neuralgia, hiatal hernia, esophagitis, anxiety states, and other psychogenic conditions (Silber, 1987).

Because the differential diagnosis of chest pain is so crucial in cardiac disease, assessment of episodes of chest pain is very important for health care. Differentiating anginal pain from pain due to other causes is facilitated when the quality of the pain is considered along with its duration, precipitating factors, and associated symptoms (Cohn & Braunwald, 1988).

Cardiac catheterization, or coronary angiography, is the "gold standard" for a definitive diagnosis of coronary artery occlusion as the cause for cardiac chest pain. Catheterization results are usually reported according to the number of vessels affected and their percentage of stenosis. The number of vessels affected is termed single, double, or triple vessel

disease. A coronary stenosis is considered significant when the diameter is reduced greater than 70% of normal (Silver, Baroldi, & Mariani, 1980). The status of the left main coronary artery is reported as well as left ventricular function expressed as an ejection fraction. Yet the patient history is still regarded as a sensitive indicator of the presence of angina and coronary artery disease by clinicians (Diamond & Forester, 1979; Campbell et al., 1986).

Etiology of Cardiac Pain

The etiology of cardiac pain is not fully understood. Some evidence suggests that agents such as bradykinin, histamine, or serotonin are released from cells as a result of transient ischemia (Cohn & Braunwald, 1988). Intracardiac sympathetic nerve fibers in walls of coronary vessels and between cardiac muscle fibers carry afferent nerve impulses to the cardiac plexus at the aortic arch. They travel through the upper fourth or fifth ganglia of the thoracic sympathetic chain and then via white rami communications to thoracic spinal dorsal root ganglia or occasionally to cervical dorsal root ganglia where their cell bodies are located. Impulses then project to the corresponding spinal ganglia in the spinothalamic tract, on to the thalamus, and finally to the cerebral cortex (Silber, 1987). Excitation of adjacent nerve fibers in common nerve pathways to the spinal cord is thought to cause the radiation of pain to various parts of the body (Cohn & Braunwald, 1988).

The reason for the oppressive feeling sometimes caused by cardiac pain is unknown. One hypothesis is that reflex

constriction of blood vessels leading to ischemia of muscles of the chest region may give rise to that sensation (Guyton, 1986).

Conflicting reports exist about the correlation between severity of the underlying cardiac disease and severity of chest pain. Silber (1987) states that the duration of angina increases directly with the degree of coronary vessel obstruction, classifying angina as a progressive disease. He also believes that radiation of pain to other sites increases with the extent of coronary artery disease. In contrast, Cohn and Braunwald (1988) suggest that in any individual patient, the extent of the disease cannot be predicted by the severity of chest pain. In either case, there is need for accurate and thorough assessment of pain episodes.

Memory and Recall of Pain

A single definition of pain does not exist, but most discussions of pain acknowledge its subjective dimension. According to Mersky (1973), perception of pain is subjective, but attributed to physical events experienced in the body. The quality and intensity of pain episodes can never be totally objectively assessed by someone else. Clinicians must depend on patients' subjective reports, often gathered retrospectively.

With retrospective self reporting of pain episodes, memory, or the accuracy of recall, is a confounding factor. Eich, Reeves, Jaeger, and Graff-Radford (1985) studied factors affecting pain recall of patients with headaches. They found that the amount of pain the patients were currently experiencing distorted their memory of the intensity of earlier

pain. The patients recalled the level of prior pain as being more severe than they had reported at the time, when the intensity of current pain was high. Pain was recalled as less severe when the current pain the patients experienced was low.

Mersky (1973) reported anxiety to be a factor in pain recall, with people who were anxious reporting a higher pain intensity from a noxious stimulus than those who were more relaxed. He noted thresholds for complaints of pain have also been found to vary with sex, occupation, cultural attitudes, ethnic group, and mood. These differences in pain threshold are a factor in patients' awareness of pain and may influence their perception of anginal pain.

In a study by Hunter, Philips, and Rachman (1979), patients with neurosurgical head pain recalled their pain one and five days later. Subjects underestimated their original pain intensity rating at both occasions. In contrast, Linton and Melin (1982) reported that patients with chronic back or joint pain significantly overestimated the intensity of their pain three to eleven weeks retrospectively. The different results in these two studies could have been due to the time interval for the pain recall or perhaps to the different experience of acute versus chronic pain sufferers.

Jamison, Sbrocco, and Parris (1989) studied subjects with chronic pain who were asked to monitor their pain intensity hourly, for one week using a 0-10 numerical rating scale. One week later the subjects recalled their average pain

intensity four times during the day. Averages from actual pain ratings were compared to the estimated pain average. Most patients were found to overestimate their pain from the previous week.

Lowe and Roberts (1988) studied patients in labor. The women tended to underestimate the pain of early labor and overestimate transitional labor pain when compared to their in-labor pain ratings using the Present Pain Intensity scale (PPI), a five level verbal rating scale of the McGill Pain Questionnaire. Pain ratings were more consistent between in-labor reports and postpartum recall using the summative score of the Pain Rating Index of the McGill Pain Questionnaire, which is based on sets of verbal descriptors. This suggests that both the type of report and the particular dimension of pain being recalled can affect memory of pain. For example, the intensity of previous pain might not be recalled accurately, but the qualitative description of the pain might be.

Norvell, Gaston-Johansson, and Fridh (1987) also studied pain intensity in various phases of labor. They found significant differences between the amount of pain reported concurrently and the amount of pain remembered retrospectively. Actual in-labor pain reported by a visual analog scale was more intense than retrospective remembered pain two days postpartum.

Only one study was found evaluating chest pain recall. Engel, Baile, Costa, Brimlow, and Brinker (1985) had patients complete self-report forms about chest pain experienced at home while awaiting diagnostic cardiac catheterization. The

referring physicians also completed a form about the patients' "typical" chest pain. The investigators found that the referring physicians significantly overestimated the frequency and severity of their patients' pain. The data from this study indicates that physicians either judged the symptoms differently than did their patients, or the patients did not report their symptoms accurately when giving retrospective information to the physicians. Engel et al. concluded that physician based retrospective evaluation yielded different results than patient based concurrent assessment.

Since there are no truly objective ways to measure and diagnose pain, patients must, in fact, diagnose their own pain. This makes communication between the patient and health care providers an essential component of its measurement and treatment. Efforts to assess pain quantitatively for comparisions among different patients, or for comparisons of the same patient with more than one episode of pain, have led to the development of various pain instruments or scales. Most have been developed in research settings and ask for pain intensity utilizing various numerical and visual analog scales or pain word descriptors. One of the most well known pain measurement instruments is the McGill Pain Questionnaire, which utilizes a combination of pain intensity scales and adjective descriptors to evaluate pain (Melzack, 1975).

In clinical settings, chest pain is typically assessed via physician or nurse interview. Questions are asked to elicit retrospective data regarding the patients' pain episodes. The

extent to which this historical data represents the patients' actual pain experience and how complete a picture of the pain episode is obtained is unknown. Research is needed to develop a tool useful for the assessment of chest pain in which information can be obtained without distortion. This study, by assessing pain concurrently and comparing it to retrospective reports, will provide a mechanism for more accurate and complete appraisal of acute chest pain.

Conceptual Framework

Adequate assessment and management of pain in cardiac patients depend to a great extent upon the patients' ability to recognize, analyze, and report their pain episodes. Orem's self care theory provides a useful framework for the assessment and management of patients with chest pain.

According to Orem (1985) "self-care is the practice of activities that individuals personally initiate and perform on their own behalf in maintaining life, health, and well-being" (p. 19). The essential condition for making practical judgments about self-care is a condition of awareness of reality which includes (a) awareness of internal or external conditions relevant to health and well-being, for example, awareness of chest pain; (b) awareness of characteristics of the condition, for example, awareness that chest pain occurs with exertion; (c) awareness of the meaning of these conditions for health and well-being, for example, awareness that chest pain may indicate the need to seek medical treatment; and (d) awareness of the beneficial or harmful results which will come about by taking

one course of deliberate action in preference to another, for example, awareness that rest and/or nitroglycerin will alleviate the pain.

Therapeutic self-care demand is the totality of self-care actions to be performed for some duration to meet self-care requirements. Self-care agency is the power of an individual to engage in estimative and productive operations essential for self care (Orem, 1985). For cardiac patients, self-care requirements include factors such as following a low cholesterol diet, engaging in exercise, managing a medication regimen, and monitoring their symptoms of dyspnea, fatigue, and chest pain. Self-care deficit is the inadequacy of self-care agency to meet the known therapeutic demand (Orem, 1985). For example, patients who are experiencing chest pain may lack knowledge about what is causing their pain and how they might alleviate chest pain episodes. Keeping a concurrent record of chest pain may increase patients' awareness of the details surrounding their chest pain episodes and improve the accuracy and completeness of their report to health care providers. Improved self assessment and subsequent expression of chest pain episodes when patients are contacting their health care providers enhances the quality of data received from patients and therefore promotes therapeutic interventions.

The relationship between self-care agency and therapeutic self-care demand determines when and why nursing is needed. Nursing must assess patients' self-care

agency and their abilities to meet self-care requirements. For example, patients who lack knowledge regarding the meaning of their chest pain require nursing intervention to instruct them about angina and cardiac disease. As patients become more knowledgable and able to carry out self-care measures, the need for nursing intervention lessens (Figure 1). Orem's supportive-educative nursing system can be used in situations where the patient is able to perform, or can and should learn to perform, required measures of therapeutic self-care, but cannot do so without assistance. Assisting techniques in these situations include combinations of support, guidance and teaching. Patients' requirements for assistance relate to decision-making, behavior control, and acquiring knowledge and skills (Orem, 1985).

A concurrent diary used by patients to record chest pain episodes could be used as a basis for teaching patients about their cardiac disease. Because memory can be a confounding factor in retrospective recall, use of the concurrent diary will allow nurses to view a more accurate picture of patients' chest pain episodes. Using the concurrent diary completed by patients, nurses can then teach patients how to explain and differentiate their chest pain in terms of frequency, activity, mood, duration, intensity, descriptors, and location and also give guidance for alleviating or preventing chest pain episodes. Patients by using the diary should be able to recall their chest pain episodes more completely and accurately. The outcome will be that patients' self-care agency will be supported,

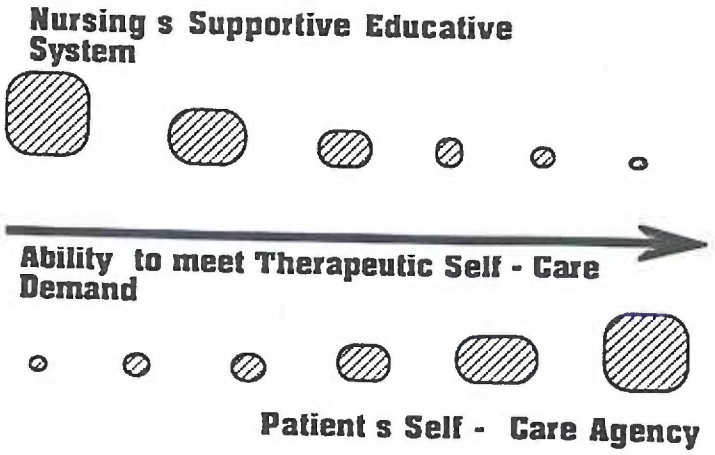


Figure 1. As patients' self-care agency increases, e. g. increased patient knowledge, the need for a supportive and educative nursing role decreases and the ability to meet self-care demands increases.

and their abilities to perform self-care measures will be improved.

In conclusion, concurrent chest pain assessment will benefit patients in two ways: directly, by increasing patients' ability to assess and treat their condition; indirectly, by giving health care providers a data base from which to make decisions regarding patient interventions. The interaction between the two agencies provides a teaching/learning environment that should result in the safe management of patients' conditions.

# CHAPTER 3

# METHODS

The study used an experimental and descriptive design to evaluate the effect of a concurrent diary on patients' retrospective reports of chest pain (Figure 2). This chapter describes the study methods, including the variables, subjects and setting, and the two instruments developed for the study, the Chest Discomfort Diary and Chest Discomfort Interview.

## Variables

The independent variable for the first purpose of assessing completeness of retrospective pain reports was the use of a concurrent Chest Discomfort Diary (Appendix A). The dependent variable was the completeness score from the retrospective Chest Discomfort Interview (Appendix B) in which the eight categories of frequency, activity, mood, duration, intensity, descriptors, location and treatment were elicited.

The independent variable for the second purpose of determining accuracy in recall of pain within the experimental group was the timing and method of reporting chest pain data. The dependent variable was the accuracy score for content reported within the eight categories of chest pain data.

The independent variable for the third purpose of determining accuracy of recall of the control group was the

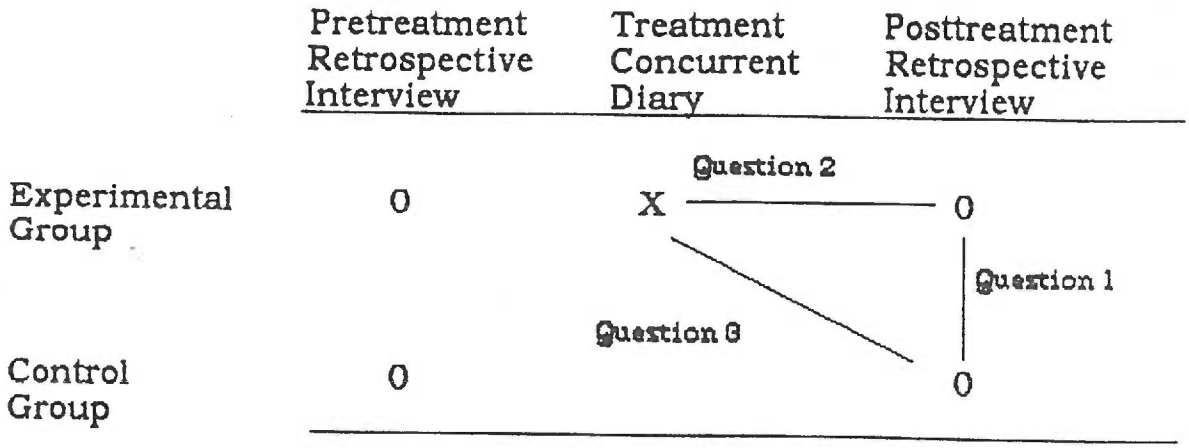


Figure 2. Schematic Diagram of Study Design

X = experimental treatment

0 = observation/measurement

Question 1 = completeness of retrospective pain reporting

Question 2 = accuracy of recall within experimental group

Question 3 = accuracy of recall of control group

timing and method of the pain report, either concurrent (diary), or retrospective (second interview). The dependent variable was the content within the three quantitative categories of frequency, intensity and duration.

Subjects and Setting

The subjects were a convenience sample of patients from a private cardiology practice. They had a diagnosis of either stable or unstable angina and were scheduled for cardiac catheterization because of recurrent chest pain. All subjects were at least 21 years of age, able to read and write English, had no cognitive impairment, and lived within the region of the clinic. They had no other known condition that commonly causes chest pain. Patients with a history of previous myocardial infarction or angina were included. Patients who needed emergent coronary artery bypass surgery during the data collection period were excluded from the study.

Demographic variables (Appendix C) were obtained from the subjects' medical records at the cardiology office. Information included age, marital status, sex, occupation, educational level, and duration of diagnosed coronary artery disease. Extent of coronary artery disease was established by cardiac catheterization for each subject.

Chest Discomfort Diary

The experimental treatment was the use of a Chest Discomfort Diary (Appendix A) used by subjects to record concurrent information about chest pain. This diary was developed by the investigators for the study because existing tools found in the literature did not meet the specific needs for chest pain assessment. The tool used by Engel et al. (1985) provided the initial framework for the diary's development. The diary was a booklet consisting of ten copies of a two page questionnaire, with the subjects completing one questionnaire for each chest pain episode. Multiple choice answers were checked or circled for nine questions about eight categories of information that assess chest pain. Content validity for the instrument came from two sources; first, from the aspects of chest pain that are typically described in the literature, and second, from two cardiovascular nurse specialists and a cardiologist who evaluated the instrument and gave input about the categories necessary for the assessment of the patient with acute chest pain. Since some subjects could have described their chest sensations as discomfort instead of pain, the title of the diary utilized the word discomfort.

Eight categories of assessment were chosen based on clinical relevance. The categories were frequency, activity, mood, duration, intensity, descriptors, location, and treatment. Nurses depend on information about these aspects of chest pain episodes to establish a nursing diagnosis such as altered comfort or ineffective coping, and develop a treatment plan.

1. Frequency. The frequency of pain episodes that subjects experienced were determined by the number of diary forms completed in the period of time from the office visit, to the follow-up home visit, 7-10 days later.

2. Activity. This category provided information about activity just prior to the chest discomfort. The awareness of the events which may precipitate chest discomfort has an impact onpatients' self-care. The first question in the diary addressed the subjects' activities experienced prior to the pain episode.

3. Mood. The diary listed eight words denoting possible emotional states subjects may have experienced immediately before a chest discomfort episode. As with activity, a subject's state of mind may be a precipitating factor of the pain (Lown, 1977).

4. Duration. The diary included a multiple choice question about the duration of their chest discomfort episodes. The duration of the chest discomfort helps to differentiate angina from noncardiac heart pain. Non-ischemic pain is often momentary, while pain lasting over 5 minutes may signify prolonged myocardial ischemia. Duration of 5 to 20 or more minutes may herald an impending myocardial infarction (Hillis, Firth, & Willerson, 1984; Braunwald, 1988).

5. Intensity. Subjects were asked to rate their pain intensity on a numerical scale of 0 to 10, with 0 representing "no discomfort or pain" and 10 representing "most severe discomfort or pain ever imagined." Numerical rating scales

have demonstrated their validity as pain intensity measures by significant positive correlations with other measures of pain intensity such as visual analog scales and their sensitivity to treatment effects (Karoly & Jensen, 1987). The anchors used in the diary were similar to the anchors used on the McGill Pain Questionnaire (Melzack, 1975).

6. Descriptors. The word descriptors used in the McGill Pain Questionnaire to describe pain were reviewed and evaluated by the researchers, the two cardiovascular nurse specialists, and acardiologist for their correlation to words used by patients when describing chest discomfort (Melzack, 1975). Thirteen word descriptors were kept from the McGill Pain Questionnaire, with the remainder deleted. The words retained were judged by the clinicians as those most often verbalized by their patients. In addition, the word descriptor "pressure" was added to the list. Research using the total McGill Pain Questionnaire, or its subsections, for the study of acute chest pain was not found in the literature.

7. Location. A body drawing for location of the chest discomfort was included as a diary category. Subjects were asked to shade all of the areas where the discomfort was experienced. An "X" was used to indicate where the pain started. The body drawing offers an easy mode for the patient who may have difficulty communicating (Stewart, 1977).

8. Treatment. This category gave an indication of subjects' approach to self-care of chest discomfort. It assisted with assessment of stable versus unstable angina by identifying

what means enabled subjects to alleviate their pain and whether the treatment was successful.

The content of the diary was evaluated by three "expert" patients who had a combined history of 15 years of angina. They were selected for their experience with acute health care systems and demonstrated ability to describe their chest pain to the cardiovascular nurse specialist. Each expert patient gave opinions on the content and format of the diary. Questions were then reworded and reordered for clarity prior to their use in the study.

Chest Discomfort Interview

The second instrument was the Chest Discomfort Interview (Appendix B), which was used to obtain pre and post-treatment retrospective pain assessment data for both experimental and control groups. The interview schedule was a modified version of the Chest Discomfort Diary administered orally.

The interview provided three levels of questioning, which allowed subjects the opportunity to respond initially with relatively little direction, then with more specific prompting as needed. A level I response was scored when subjects were able to describe their pain with spontaneous information from any of the eight categories from the diary: frequency, activity, mood, duration, intensity, descriptors, location and treatment. A level II response was scored when subjects required a prompting question about any of the eight categories from the interviewer. If even further prompting was required to obtain an answer, i.

e. choices of available responses from the diary were given verbally, the response was at level III. Three by five cards printed with the word descriptors and mood categories were available to show to subjects for level III prompting for those categories. A body chart was available to hand the subject if level III prompting was necessary for the pain location category. Level IV indicated no response.

Scoring for completeness of the retrospective interview was done by assigning 3 points to each level I response, 2 points for each level II response, 1 point for each level III response, and 0 points for level IV (no response) within a category. The possible range of completeness scores was 0 to 24 points, with 24 being the most complete pain reporting possible.

Scoring for accuracy of the retrospective interview was done by comparing the interview content to that recorded in the concurrent diary record for that episode. One point was given for each category that the recall compared accurately to the diary in seven categories: activity, mood, duration, intensity, descriptors, location and treatment. For pain intensity, subjects were allowed to vary $\pm 1$ number on the scale to be scored as accurate since a small interval change would not alter treatment. Accuracy of the remaining category, frequency, was determined by comparing the recalled number of episodes with the number of diary forms completed. Any variation in recalled frequency was considered inaccurate, as an increased number of pain episodes might make a difference in patient

treatment. Accuracy scores, therefore could range from 0 to 8 points.

Procedure

At the cardiology office, a nurse investigator explained the study to potential subjects and requested their consent to participate (Appendix D). The first subject was placed in the experimental group by a coin toss; subsequent subjects were alternately placed in control, then experimental groups. Both groups had their pre-treatment interview by the same investigator using the Chest Discomfort Interview. In the pre-treatment interview, subjects were asked to describe a typical chest pain episode that had occurred within the week prior to their appointment at the clinic. Subjects in the experimental group then received a Chest Discomfort Diary and were instructed in how to complete a diary for each subsequent episode of chest pain or discomfort experienced outside a health care setting. The control group received only the interview (see Data Collection Procedure, Appendix E).

A pilot study found that the time between an initial interview and cardiac catheterization varied from 2 to 14 days. The mean time between scheduling the catheterization and its completion for the study setting was eight days. Therefore, for both groups, the post-treatment interview was scheduled between 7 and 10 days from the initial pre-treatment interview. It was conducted in subjects' homes by one of the three nurse investigators. Interviewer reliability was assessed when a trial episode of chest pain was recorded on tape and scored the

same by each of the three interviewers. The study interviews were also taped, so that data could be reviewed by more than one investigator when their was a question regarding scoring. Only two interviews needed scores confirmed by more than one interviewer during the study.

For the post-treatment retrospective interview, experimental subjects were asked to recall a typical chest pain episode which they had recorded in their diaries since the initial interview. They were then asked to identify the approximate day and time of the episode they described, so that the appropriate diary record could be used later for comparison. The diaries were not consulted during the actual interview. Subjects who did not have pain during the treatment period were asked to recall the pain episode they described at their initial pre-treatment retrospective interview.

# CHAPTER 4

# RESULTS

In this experimental study, the effect of keeping a chest pain diary on later recall of the same chest pain was analyzed for completeness and accuracy. Statistical analysis was done with the Crunch Statistical Package, Version 3 (Crunch Software Corporation, Oakland, CA).

## Characteristics of the Patient Sample

Initially, 44 patients were recruited. Twelve were excluded due to coronary bypass surgery after cardiac catheterization, and one declined further participation after the initial interview. The remaining 31 subjects ranged in age from 43-76 years, averaging 62.1 $\pm$ 7.9 years (mean $\pm$ standard deviation), and included 23 men and 8 women. There were 16 experimental and 15 control subjects.

To determine if the experimental and control groups were equivalent in regard to background variables, chi square and 2-sample t tests were done to evaluate categorical variables and continuous variables respectively. As shown in Table 1, the groups were similar in regard to the measured variables age, gender, cardiac catheterization results, education and the pre-treatment pain report data as measured by initial interview completeness scores.

Table 1

Comparison of Subjects in Experimental and Control Groups

| Variable | Experimental group (n=16) | Control group (n=15) | Test statistic | p value |
|---|---|---|---|---|
| Age (years) | 63.7 ± 7.3 | 60.4 ± 8.3 | t = 1.17 | .25 |
| Gender | | | | |
| Male | 13 | 10 | $X^2$ = 0.27 | .61 |
| Female | 3 | 5 | | |
| Catheterization | | | | |
| CAD present | 10 | 11 | $X^2$ = 0.68 | .79 |
| Normal arteries | 6 | 4 | | |
| Education (years) | 12.4 ± 2.1 | 12.9 ± 2.1 | t = -0.65 | .52 |
| CAD (years since initial diagnosis) | | | | |
| <1 | 4 | 7 | $X^2$ = 4.79 | .09 |
| ≥1-5 | 4 | 6 | | |
| >5 | 8 | 2 | | |
| Pre-treatment score* | 19.1 ± 2.4 | 18.4 ± 1.7 | t = 0.89 | .38 |

Note. Values are means ± SD for continuous variables and frequencies for categorical variables. CAD = coronary artery disease.

*The pre-treatment score is the mean completeness score at the initial retrospective interview, with a possible range of 0 to 24 (most complete).

The groups tended to differ in duration of diagnosed coronary artery disease ($X^2$ =4.79, $p$ = .09), with subjects in the experimental group having had disease longer than the control group.

Question 1

To evaluate the effect of keeping a concurrent chest pain diary on the completeness of retrospective pain reports, the completeness scores from the post-treatment interview were compared in the experimental and control groups. If the diary intervention made a significant difference, then the experimental group would describe chest pain more completely at the post-treatment interview than the control group.

During the treatment interval of 7-10 days, 19 subjects (61%) experienced chest discomfort or pain about which they kept a diary and were interviewed retrospectively. Twelve subjects (39%), however, did not report chest discomfort or pain during this time and were interviewed about their prior pain instead. Subjects' pre-treatment and post-treatment completeness scores are summarized in Table 2 and illustrated in Figures 3 and 4. Experimental subjects, either with or without pain separately, or combined, had a small improvement in their ability to report pain completely at the post-treatment interview. In contrast, control subjects had a small decline in the completeness of their reporting.

An analysis of covariance was used to evaluate the data in order to control for the pre-treatment completeness of

Table 2

Retrospective Chest Pain Completeness Scores for Experimental and Control Subjects

| Pain Status | n | Pre-treatment score | Post-treatment score |
|---|---|---|---|
| | | Experimental subjects (n = 16) | |
| With pain | 11 | 19.0 ± 2.5 | 19.5 ± 1.8 |
| Without pain | 5 | 19.2 ± 2.2 | 20.4 ± 1.3 |
| Combined | 16 | 19.1 ± 2.4 | 19.8 ± 1.7 |
| | | Control subjects (n = 15) | |
| With pain | 8 | 18.8 ± 1.2 | 17.9 ± 2.0 |
| Without pain | 7 | 18.0 ± 2.2 | 17.0 ± 3.1 |
| Combined | 15 | 18.4 ± 1.7 | 17.5 ± 2.5 |

Note. Values are means ± SD for continuous variables and frequencies for categorical variables. Maximum score = 24.

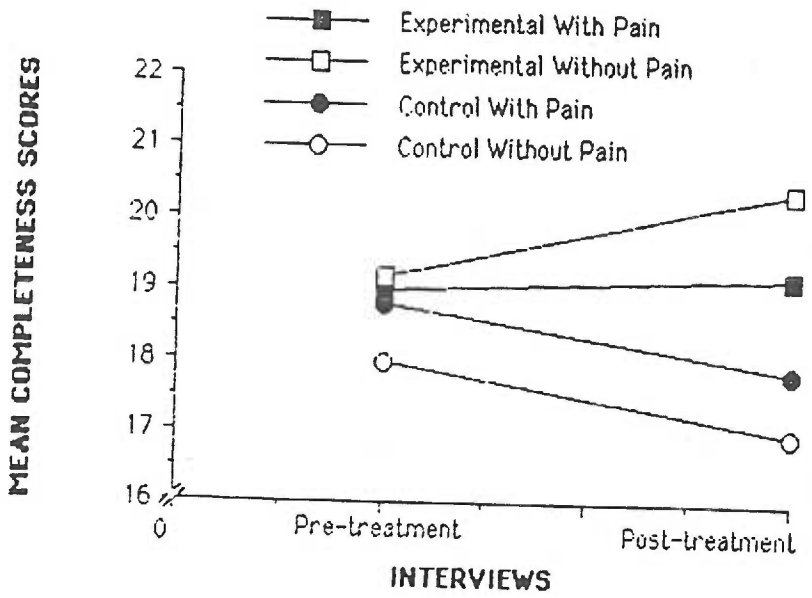


Figure 3. Completeness scores for experimental and control subjects with or without pain in the treatment interval of 7-10 days.

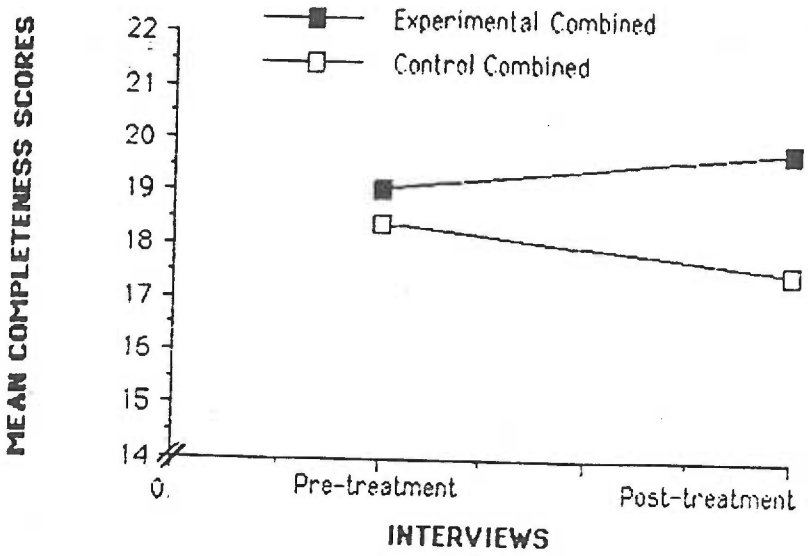


Figure 4. Combined completeness scores for experimental and control subjects.

subjects' retrospective pain reports i. e.subjects' ability to describe their pain initially. Subjects who had pain and kept a diary had a tendency to score better on the post-treatment retrospective interview ($F = 3.27$, $p = .09$) than control subjects with pain. Similarly, subjects who were instructed to use the diary, but did not have pain during the treatment interval, had a tendency to score higher than control subjects without pain ($F = 3.65$, $p = .09$). Because the results for subjects with and without pain were similar statistically, in terms of their F score and significance level, they were combined for analysis. Conceptual rationale for this was that all experimental subjects received the diary instruction and had it available for their review prior to the post-treatment interview. As shown in Table 3, the combined group of experimental subjects had a significantly higher mean completeness score than those in the control group on the post-treatment retrospective interview ($F = 7.99$, $p = 0.009$).

Categories that most subjects discussed spontaneously at both interviews, as shown by level I responses on Table 4, were activity, description, location, treatment, and frequency . The category requiring the most prompting by the interviewer as shown by level III responses was intensity, followed by the mood and duration categories.

Table 3

Analysis of Covariance Comparing Completeness Scores for Retrospective Pain Reports in Experimental and Control Groups, with Initial Completeness Scores as the Covariate.

| Source of Variance | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Subjects with pain (n = 19: 11 experimental, 8 control) | | | | | |
| Initial score (covariate) | 1 | 7.53 | 7.53 | 2.36 | .144 |
| Group | 1 | 10.46 | 10.46 | 3.27 | .089 |
| Residual | 16 | 51.17 | 3.20 | | |
| Total | 18 | 69.16 | | | |
| Subjects without pain (n = 12: 5 experimental, 7 control) | | | | | |
| Initial score (covariate) | 1 | 32.50 | 32.50 | 6.19 | .035 |
| Group | 1 | 19.18 | 19.18 | 3.65 | .088 |
| Residual | 9 | 47.25 | 5.25 | | |
| Total | 11 | 98.92 | | | |
| All subjects combined (n = 31: 16 experimental, 15 control) | | | | | |
| Initial score (covariate) | 1 | 34.22 | 34.22 | 9.13 | .005 |
| Group | 1 | 29.95 | 29.95 | 7.99 | .009 |
| Residual | 28 | 104.93 | 3.75 | | |
| Total | 30 | 169.10 | | | |

Table 4

Frequency of Prompting Required for Each Chest Discomfort Category.

| Category | Level I | Level II | Level III | Level IV |
|---|---|---|---|---|
| | Pre : Post | Pre : Post | Pre : Post | Pre : Post |
| Activity | 17 : 13 | 13 : 16 | 1 : 2 | 0 : 0 |
| Mood | 3 : 2 | 22 : 24 | 5 : 5 | 1 : 0 |
| Duration | 8 : 9 | 18 : 18 | 5 : 4 | 0 : 0 |
| Intensity | 1 : 1 | 7 : 16 | 22 : 13 | 1 : 1 |
| Description | 27 : 27 | 3 : 0 | 1 : 4 | 0 : 0 |
| Location | 29 : 23 | 2 : 6 | 0 : 1 | 0 : 1 |
| Treatment | 13 : 16 | 16 : 15 | 2 : 0 | 0 : 0 |
| Frequency | 27 : 26 | 4 : 4 | 0 : 0 | 0 : 1 |

Note. n = 31; pre = frequency of responses at a given prompting level for the pre-treatment interview; post = frequency of responses at a given prompting level for post-treatment interview.

Question 2

To determine whether experimental subjects who kept a concurrent diary about their pain were able to provide accurate retrospective reports, accuracy scores were determined for the subjects who had pain during the treatment period ($n$ = 11). A point was scored for each of the eight categories when data from the post-treatment retrospective interview agreed with the answers recorded in the diary for the designated chest pain episode. If the diary intervention made a significant difference, then subjects would be likely to recall their pain episode accurately.

The 11 experimental subjects who had pain and used the diary were relatively accurate in their retrospective reporting. Accuracy scores ranged from 5 to the maximum possible score of 8, with a mean score of 6.5 $\pm$ 0.8. As shown in Table 5, subjects were most accurate in reporting pain duration, intensity, description, and treatment. Each of those categories was recalled correctly by 10 subjects.

The most difficult categories to recall accurately were mood and pain frequency. Three of the eleven subjects could not remember their mood. Of the 10 subjects with complete frequency data, 5 could not remember pain frequency. The two subjects with less than 5 pain episodes underestimated frequency by only one episode. However, of the three subjects who experienced more frequent pain (7-10 episodes), two

Table 5

Number of Experimental Subjects Recalling a Chest Pain Episode Accurately or Inaccurately (n = 11)

| Variable | Accurate | Inaccurate |
|---|---|---|
| Activity | 9 | 2 |
| Mood | 8 | 3 |
| Duration | 10 | 1 |
| Intensity | 10 | 1 |
| Description | 10 | 1 |
| Location | 9 | 2 |
| Treatment | 10 | 1 |
| [a]Frequency | 5 | 5 |

Note. [a]n = 10.

overestimated their pain by 4-6 episodes and one could not provide a response. One experimental subject with pain was excluded from the frequency data because she reported more pain episodes than the number of diaries provided for recording and, therefore, accuracy could not be assessed.

Question 3

To determine whether control subjects who did not keep a concurrent diary about their pain were accurate in the quantitative aspects of their retrospective pain reports, the pain frequency, intensity and duration data from the second interview were compared to diary data provided by the experimental group. This analysis was based on the assumption that through randomization, subjects in both groups had equivalent pain experiences. If the diary intervention made a significant difference, the control group would be less likely to recall their pain accurately.

Experimental subjects (n=11) experienced 2-10 episodes of pain, as indicated by the number of diaries completed. Their pain intensity ratings varied from 1-8 on a scale of 0-10. Similarly, control subjects (n=8) reported 1-10 episodes of pain, except for a single subject who reported 30 episodes, with pain intensity ratings varying from 1.5-8. In both groups, half of the subjects had a pain duration of pain of less than 5 minutes and half had pain lasting 5 minutes or more.

Two-sample t-tests were used to compare the frequency and intensity data from the control subjects' second interview to concurrent diary data from the experimental group, and a

chi square test was used for the duration data. As shown in Table 6, no significant difference was found between the control groups' pain information and the presumed representative concurrent pain data from the experimental group.

Table 6

Comparison of Pain Frequency, Intensity, and Duration Between Concurrent Experimental Diary Reports and Control Groups' Retrospective Pain Reports

| Variable | Experimental diary report (n=11) | Control pain report (n=8) | Test statistic | p value |
|---|---|---|---|---|
| Pain frequency | [a]5.1 ± 2.8 | 7.3 ± 8.7 | t = -0.69 | 0.50 |
| Pain intensity | 4.4 ± 2.6 | 4.5 ± 1.9 | t = -0.08 | 0.93 |
| Pain duration | | | | |
| <5 minutes | 6 | 4 | $X^2$ =0.0726 | 0.79 |
| ≥5 minutes | 5 | 4 | | |

[a]n= 10.

# CHAPTER 5

## DISCUSSION, RECOMMENDATIONS, AND SUMMARY

This chapter discusses the study findings, including comments about the interview methodology. Recommendations, limitations, and a summary of the study are also included.

### Question 1

Analysis of the completeness scores indicated small but significant improvement in the description of chest pain by patients who received the diary intervention. These results suggest that patients may be able to give more complete retrospective reports regarding their chest pain after keeping a concurrent diary.

The diary may have contributed to improvement in experimental subjects by increasing their awareness of the characteristics of pain and providing practice in a systematic method of noting the information. The process of completing diaries exposed subjects to important elements of chest pain assessment, increasing awareness of their health status and supporting the estimative and judgment aspects of self-care agency. Engel (1985) found that health care providers may judge patients' symptoms differently than the patient himself. Nurses, as members of the health care team, can utilize this more complete self-assessment data and compare current description to patients' previous pain patterns. Nurses can also review the patients' self-care treatment measures for adequacy,

and evaluate whether additional access to the health care system is necessary.

There is a question, however, as to whether use of the diary alone made the difference between the two groups. The experimental group did improve in the ability to describe chest pain completely, while the control group deteriorated in their description. The results were similar both for experimental subjects who had angina during the treatment period, and therefore both instructions and opportunity to use the diary, and for those who had no angina during the treatment period, and therefore, no opportunity to utilize the diary. The subjects without pain during the treatment period, at the second interview repeated a description of the pain episode they recalled at the initial interview. It has to be assumed, then, that some intervening process, other than use of the diary had a portion of the effect.

A difference between the two groups was the intervention instruction given by the investigator when the diary was introduced to the experimental subjects and each category verbally explained. This essentially was a method of teaching patients how to report their chest pain symptoms; therefore it may have helped subjects report better. The questions contained in the diary are pertinent to information needed by health care providers.

The two groups also differed in the length of time with diagnosed coronary artery disease. The experimental subjects had been treated for angina longer and perhaps this gave them

more experience at describing their chest pain to health care providers than the control subjects. All patients interviewed were under current treatment for angina. Necessary alterations in therapy may have been made by their cardiologist at the office visit that occurred at the same day the diary intervention was introduced. Those treatment changes could be the reason that the chest discomfort previously experienced by some of subjects was ameliorated, leading to less frequent chest pain episodes during the intervention week.

Question 2

Because health care providers rely so heavily on retrospective information, it is helpful to determine how accurately patients can recall their pain (Campbell et al., 1986).Subjects who used the diary were fairly accurate overall when comparing what they recorded in their diaries for a specific pain episode to what they were able to recall about the same episode retrospectively. It is difficult to put a judgment on whether the mean accuracy score of 6.5 was "accurate enough," however, so specific categories that were difficult for these subjects were examined.

Recalling the number of pain episodes, the most inaccurate category, was difficult for subjects who had pain frequently. In this study, subjects who had fewer than five episodes were able to remember accurately the number they experienced, but those who had pain more frequently did not recall the number of episodes accurately. This suggests that patients have difficulty in differentiating one pain episode from

another as frequency increases. Using a diary each time pain occurs could prevent this tendency.

In order for patients to have adequate self-care knowledge, they need to be able to identify at what point they should access the health care system. The diary intervention could be useful for patients with frequent chest pain, as it could signal when a change in therapy or at least a call to the office is required. For example, a patient may be instructed to report when more than five diaries have been completed within a certain period of time.

Mood was the second most inaccurate category. The three subjects who were inaccurate recorded negative moods of being tired, upset, or worried in their diary, but then retrospectively recalled their moods as being worried, relaxed, and angry respectively. Because of the small sample size, it is difficult to draw conclusions regarding the accurate recall of mood, other than to reiterate that it was one of the two most difficult categories for subjects to answer without prompts by the investigator.

Mersky (1973) suggested that anxious subjects overestimated their pain intensity. In this study, the one inaccurate subject in the intensity category was also inaccurate in reporting his mood, but did report a negative mood state both concurrently and retrospectively. He also overestimated his pain retrospectively. It would be interesting to compare mood states with reported pain intensity in more depth. For example, subjects who reported a negative mood at the time of

their pain could be compared to patients who had positive mood states prior to their pain. Would one group of patients report a higher pain intensity?

Even though the intensity category required the most prompting by the interviewer to get a response, it was one of the most accurate categories overall. How accurate does a patient need to be before the information will be used to make clinical judgments, either by the patient in terms of self-care or by the health care provider? For the purposes of this study, $\pm 1$ on the 0-10 scale was allowed before subtracting an accuracy point. It appears that the subjects neither overestimated or underestimated the severity of their pain up to 10 days retrospectively. This conflicts with the findings of the research studies reported earlier (Eich et al., 1985; Engel et al., 1985; Hunter et al., 1975; Jamison et al., 1989; Linton et al., 1982; Lowe et al., 1988; & Norwell et al., 1987), all of which had significant discrepancies of retrospective pain reporting when compared to concurrent pain ratings. The one experimental subject who was inaccurate overestimated her pain retrospectively. If the $\pm 1$ decision rule were not used and any inaccuracy counted, 5/11 would have overestimated their pain, 3/11 underestimated their pain, and 3/11 recalled their pain perfectly.

Question 3

In this study, experimental subjects who used a diary were fairly accurate in their retrospective reports (Question 2). The next step was to determine if the diary was one reason for

that accuracy. Therefore, the retrospective pain intensity, frequency, and duration data of control subjects who did not use the dairy, were compared to the data from the diaries of experimental subjects, assuming this would be representative of the actual pain experience of both groups. It was expected that if the two groups were similar in their pain experience and the diary made a difference in accuracy of reporting, the control group would tend to be inaccurate in the recall of pain information. However, no significant difference was found between the retrospective control and concurrent diary data for the three categories evaluated. This suggests the control group may be accurate in retrospective recall, at least for these three variables. However, the control groups' retrospective data were more variable in the pain frequency category than the reference data (diary), decreasing the chance for significant results. Also, if the pain experience was not equivalent between groups, the comparison of concurrent diary and control retrospective information would be invalid.

Interview Methodology

A review of the interview methodology will assist in understanding the results of this study. The technique of using increasingly specific levels of prompting during the interview was easily done and encouraged active involvement by the patient. Active listening by the nurse investigator was necessary to identify gaps in the spontaneous information provided by the patient. Only after assessing what the subject said were categorical questions offered (level II prompt).

Specific answers were offered as the last resort if the subjects were unable to give a response (level III prompt). This interview method increased the chance of obtaining the patients' perceptions of their pain and minimized interviewer bias.

Prompting directly affected the completeness scores which were discussed earlier. Only one control subject spontaneously discussed pain intensity at the pre-treatment interview and one experimental subject at the post-treatment interview. Twenty-two subjects required level III prompting at the first interview to the suggested 0-10 scale. Six subjects improved to level II at the second interview. This suggests that subjects were able to learn to consider their pain severity in terms of a numerical rating scale, but still needed to be prompted to actually verbalize their pain on this scale.

Although a subject might need prompting, accuracy was high. For example, five subjects needed level III prompting at the post-treatment interview, but then remembered their mood accurately. This suggests that patients with chest pain may not consider their frame of mind to be a contributory factor and prompting may be needed to elicit mood information.

Recommendations

The findings of this study suggest that instructing patients to use a concurrent chest pain diary could be useful clinically. At the site where the study was conducted, patients currently are asked to note frequency of chest pain. The use of

the diary would provide the additional information commonly assessed by the practitioner and could serve as a data base for future comparison for patients with recurrent chest pain.

One of the categories, mood, was a difficult or else intimidating category for subjects to conceptualize and address and might need to be eliminated from the instrument. Alternatively, the wording of the the mood question in the interview and diary might be changed to provide for clearer understanding. Mood could also be addressed in a subsequent study to clarify its clinical usefulness and relevance to patient care.

Another recommendation would be for nurses to use the diary as a tool for patient teaching. As discussed, just the process of instructing subjects in the use of the diary may have contributed to improvement in chest pain assessment and description which in turn leads to self-care measures.

Other symptoms are also important for the cardiac patient to report accurately and completely. Additional studies could assess various aspects of cardiac conditions such as shortness of breath, exercise tolerance, or diet, utilizing a similar diary format for improved recall and self-care.

Limitations

This study had several limitations. First, the small sample reflected a high dropout rate (28%), because of the need for bypass surgery after the cardiac catheterization and the need to limit some analyses due to subjects not experiencing pain during the treatment period. This might have been rectified if

a different population had been recruited. Perhaps patients known to have coronary artery disease who were not scheduled for cardiac catheterization, but were under medical therapy, would have provided a larger population.

Second, the time period studied was short, only one week. This might be expanded to two weeks, which is a reasonable followup period for patients undergoing modification of therapy for angina. Also, to establish whether the treatment effect is lasting, a follow-up study needs to be done to evaluate the diary at variable time intervals, such as one month, six months, one year, etc.

Third, the time period between the pain occurrence and the retrospective rating varied. The range in this study was 1-10 days. Also, because the scheduling of subjects for cardiac catheterization could not be controlled, some subjects were interviewed prior to their catheterization and some after. A recommendation for further study would be to compare retrospective to concurrent pain intensity ratings for a more uniform time period and without the potential confounding experience of the catheterization procedure.

Fourth, the interviewers were not blind to which group a subject belonged prior to the post-treatment interview. Therefore, interviewer bias may have existed.

Fifth, complete compliance in filling out a diary for each episode of chest pain was assumed in this study. It is not known whether subjects had chest pain for which they decided not to fill out a report form.

Summary

Subjects who used a diary to assess their chest pain concurrently in a home setting, were able to more completely describe their chest pain when asked to recall a typical episode of pain up to ten days later. Experimental subjects tended to be accurate retrospectively, especially for the characteristics of pain duration, intensity, description, and self-treatment. Subjects who used the diary were least accurate when recalling their mood prior to the pain or when recalling the number of pain episodes experienced, especially when their pain occurred frequently. Retrospective data from subjects who did not use a diary were analyzed for accurate recall in three categories, pain intensity, duration, and frequency, and tended to report accurately.

Use of a concurrent diary offers one method of teaching patients how to report their chest pain symptoms and can improve the completeness and accuracy of those reports. More complete reporting will facilitate appropriate intervention and help meet patients' self-care requirements.

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# Appendix A

## Chest Discomfort Diary

Verbal Instructions for Diary Patients

You have been chosen to receive a diary that we would like you to complete each time you experience an episode of chest discomfort or pain between now and our next meeting at your home (in approximately one week). In this diary there are categories for describing chest pain, the same ones that we have just covered in today's interview. Please fill out a form as soon as possible after your chest pain is relieved. Please do not skip any of the sections. (Interviewer will take out a copy of the diary and read the directions at the top of the page, while showing the diary to the subject).

# Chest Discomfort Diary

Please answer the following questions about the chest discomfort or pain you have just experienced. Fill one questionnaire out each time you have chest discomfort or chest pain.

Date:_____Time:_____

ACTIVITY:

1. What activity were you doing right before the chest discomfort started?

_____ sleeping
_____ sitting
_____ walking
_____other:_____

MOOD:

2. What was your state of mind (emotional feelings) immediately before this discomfort started?
(you may check more than one)

_____ happy
_____ angry
_____ content
_____ worried
_____ upset
_____ sexually aroused
_____ tense
_____ afraid
_____other:_____

DURATION:

3. How long did this discomfort last?

_____ under five minutes
_____ five to twenty minutes
_____ more than twenty minutes

INTENSITY:

4. Circle the number which indicates the greatest amount of discomfort or pain you experienced during this episode where 0 is no discomfort and 10 is the most severe discomfort.

no discomfort or pain 0 1 2 3 4 5 6 7 8 9 10 most severe discomfort or pain ever imagined

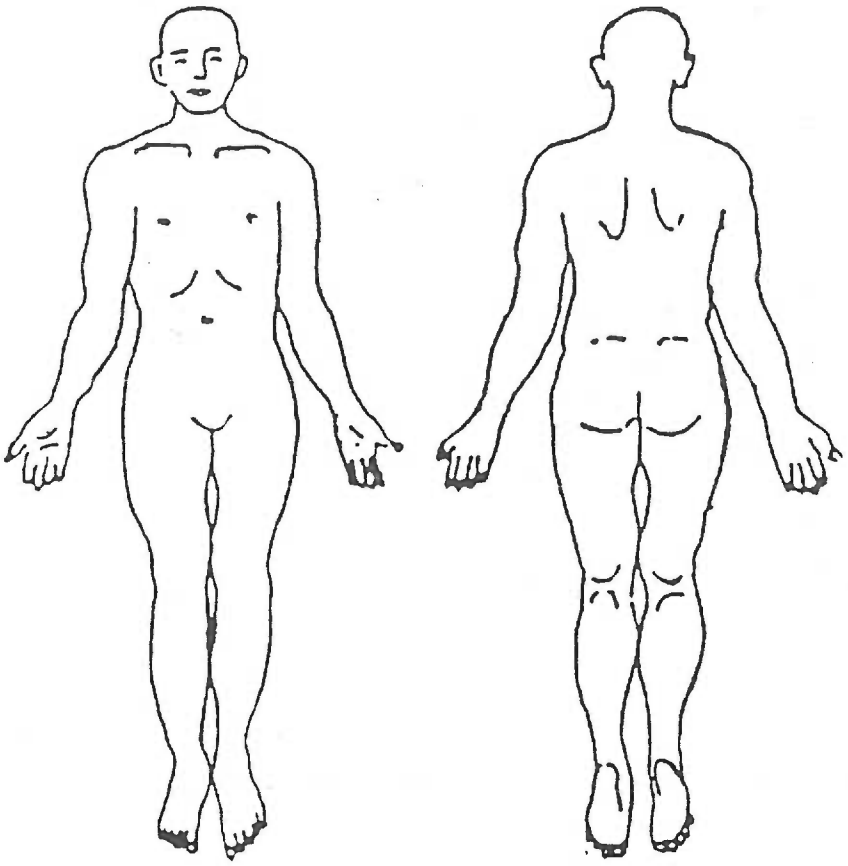
DESCRIPTORS:

5. The following words describe characteristics of chest discomfort. Please check the word or words that fit the pain or discomfort you just experienced.

_____throbbing
_____tender
_____tight
_____sharp
_____hot/burning
_____other (list)_____
_____shooting
_____splitting
_____squeezing
_____cramping
_____heaviness/pressure
_____aching
_____dull
_____stabbing
_____crushing

LOCATION:

6. Please shade all the areas where your discomfort was experienced. Place an 'X' on the place where it started.



TREATMENT:

7. What did you do to relieve your discomfort? (you may check more than one)

_____ nothing
_____ rest
_____ medicine: Kind_____
_____ other(describe)_____

8. Circle the number which indicates the greatest amount of relief you experienced where zero is complete relief and ten is no relief.

complete relief 0 1 2 3 4 5 6 7 8 9 10 no relief

9. Is this a typical episode of discomfort for you?
Yes____ No____

# Appendix B

## Chest Discomfort Interview

# CHEST DISCOMFORT INTERVIEW

Date_____ Ident # _____
(collect diary)
INTRODUCTION:

I will be asking you some questions about the chest pain or discomfort you have been experiencing. The purpose is to develop a guide to assist patients in being able to describe their own pain symptoms to help them receive the best treatment. With your permission I would like to tape this interview so I will not have to take notes while talking with you. The information will be kept confidential and you will be identified by a number. The information will be used in a research project for fulfilling requirements for a Master's Degree in Nursing at Oregon Health Sciences University in Portland. You were chosen at the Cardiology Consultant's office because of your history of chest pain. Before I start I would like to thank you for agreeing to participate in this study.

QUESTIONS: CODING:

Level I:
**InitialInterview:**
1. How many episodes of chest pain have been experienced in the past week prior to this office visit?

**PostInterview:**
1. In the time period since your office visit and this interview, how many episodes of chest pain or chest discomfort have you experienced? FREQ ____

2. Would you please choose one typical episode of chest pain or discomfort you have experienced during the past week, and describe it completely.

ACT_____
MOOD____
DURA ____
INTEN____
DESCR____
LOCAT____
TREAT____

3. When did the episode you just described take place?

Level II: I am now going to ask you more specific questions about the same chest pain episode you have been describing (prompt first with numbered question, followed by level III prompts if necessary if cannot answer).

1. What activity were you doing right before this chest discomfort started? ACT II___

Level III: sleeping, sitting, walking, other, don't remember III___ IV___

2. What was your state of mind (emotional feeling) immediately before the episode of chest discomfort you are describing? MOOD II___

Level III: happy, content, worried, upset, angry, tense, afraid sexually aroused, other, don't remember III___ IV___

3. How many minutes did this episode of pain last? DURA II___

Level III: under 3 minutes, 3 to 5 minutes, 5 to 20 minutes, over 20 minutes, don't remember III___ IV___

4. How intense was the pain episode? INTEN

Level III: On a scale from zero to ten with zero being no pain or discomfort, and ten being the most severe pain or discomfort you can imagine what number would represent the pain episode you are describing? II___ III___ IV___

5. What words would you use to describe your pain? DESCR

Level III: Here is a card with some words that describe pain and I would like you to tell me if any of them fit the chest pain or discomfort episode you are describing. II___ III___ IV___

6. Where was your pain or discomfort located? LOCAT

Level III: Here is a picture of a man, could you please place an "X" at the location where your pain or discomfort started and then shade all the areas where you experienced discomfort. II___ III___ IV___

7. What did you do to try to relieve your pain or discomfort? TREAT II___

Level III: nothing, rest, medicine (kind), other III___

8. How well was the discomfort relieved? IV___

Level III: On a scale from zero to ten with zero being complete relief, and ten being no relief, what number would represent the relief of the pain or discomfort episode you are describing?

**Postinterview,experimentalgrouponly**

9. If the number of pain episodes recalled is greater than the number of diaries filled out ask:

I see that you have had more pain episodes, than diaries filled out. Was there a reason or problem you can identify with using the chest discomfort form?

# Appendix C

## Demographic Data

| | | | | | |
|---|---|---|---|---|---|
| NAME | | BIRTHDATE | | CASE NUMBER | |
| ADDRESS | | | | | |
| CITY STATE | | ZIP | | PHONE | |
| MARITAL STATUS | | RACE | | SEX | |
| OCCUPATION | | EDUCATIONAL LEVEL | | | |
| DIAGNOSIS | | | | | |
| DURATION OF SYMPTOMS | | | | | |
| NUMBER OF YEARS OF TX FOR ANGINA | | | | | |
| CATH RESULTS | | | | | |
| DATE OF OFFICE VISIT | | | | | |
| DATE OF HOME INTERVIEW | | | | PHYSICIAN | |

# Appendix D

## Consent Form for Human Research

THE OREGON HEALTH SCIENCES UNIVERSITY

School of Nursing
Department of Adult
Health and Illness

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**Consent Form**

| | | |
|---|---|---|
| Title | Effect of Concurrent Chest Pain Assessment on Retrospective Reports by Cardiac Patients | |
| Investigators | Sue Basilicato, RN, BSN, NP | 826-2111 |
| | Peggy Groves, RN, BA, CCRN | 773-6281 |
| | Linda Nisbet, RN, BSN, CCRN | 779-3121 |
| | Graduate Students, Outreach Masters Program<br>Oregon Health Sciences University<br>School of Nursing | |
| Faculty Advisor | Roberta S. Erickson, RN, PhD | 279-7839 |

Purpose

The purpose of this study is to learn more about how people describe their chest discomfort. For proper care, it is important that the description of chest descomfort be as complete and accurate as possible.

Procedures

People in the study will be asked to describe their discomfort during two taped interviews about a week apart. The first will be in the office and the second at your home. Some people will be asked to write down information about any discomfort they have during the week between the interviews.

We will also need some background information from your office record so that we can describe the study group.

Risks and Discomforts

The study involves no known risk or discomfort. It may involve a small amount of time if you are asked to write down information about chest discomfort.

Benefits

Being in the study may or may not benefit you directly, but as a result of your participation you may contribute new information which may be of benefit to patients with chest discomfort. You will not be paid for participating in the study.

Confidentiality

Neither your name nor your identity will be used for publication or publicity purposes. Your study records will be identified by a code number rather than by name. We will keep the coded data indefinitely and may use it in future related research.

Costs

There is no cost to you for being in the study. The second interview in your home will take about 15 minutes.

Liability

The Oregon Health Sciences University, as an agency of the State, is covered by the State Liability Fund. If you suffer any injury from the research project, compensation would be available to you only if you establish that the injury occurred through the fault of the University, its officers, or employees. If you have further questions, please call Dr. Michael Baird at (503) 279-8014.

Other

The investigators have offered to answer any questions you might have. Their phone numbers are on the front of this form. Your participation in the study is voluntary. You may refuse to participate or you may withdraw from the study at any time without affecting your relationship with or treatment at Cardiology Consultants, PC. You will receive a copy of the consent form. Your signature indicates that you have read the foregoing and agree to participate in the study.

Subject: _____ Date: _____

Witness: _____ Date: _____

CC: Subject

# Appendix E

## Data Collection Procedure

Investigators

A. Linda Nisbet

B. Margaret Groves

C. Sue Basilicato

Identify Potential Subjects

1. Investigator A will obtain names of patients diagnosed with angina who are scheduled for cardiac catheterization from cardiology clinic.
   a. Patients will be at least 21 years of age and be able to speak, read, and write English.
   b. Patients will have no other conditions known to cause chest pain.

Obtain Data from Chart

2. Investigator A records background data available in the clinic chart.
   a. Give every eligible patient a study ID number, starting with 01. This will include not only patients who become study subjects but also those who do not give consent or are later excluded.
   b. Record name, age, address, gender, race, date of birth, marital status, occupation, and educational level on demographic data sheet.
   c. List diagnosis and number of years with chest pain.

d. Ascertain any history of MI (date, severity if specified).

e. Note previous cardiac catheterization (date, percentage of blockage if specified).

Obtain Patient Data

3. At clinic, investigators A explains study to patient and request participation in the study. Have patient read consent form and if he or she agrees to participate, obtain signature on consent form. Give one copy of consent form to patient and place another copy in study records.

4. Interview subject according to interview schedule (see Appendix B).

   a. Have patient recall a recent typical chest pain episode.

   b. Provide prompts as needed, according to the interview schedule to elicit information.

5. Explain to subjects in experimental group about completing Chest Discomfort Diary at home.

   a. Nurse investigator introduces and and explains the diary to patient (Appendix A) and answers any questions.

   b. Explain to patient that one diary form needs to be completed for each chest pain or discomfort episode during a one week period following initial interview.

6. Schedule a one week follow-up interview to be done by nurse investigators in subjects' home (both groups).

7. Investigators A, B, or C call patients' home one day prior to follow-up interview to confirm appointment.

   a. Follow same interview schedule in regards to patient's

# Appendix F

## Abstract

## Abstract

Assessment of chest pain can be a challenging clinical problem for nurses who must rely on patients' retrospective pain reports. In this experimental study, the effect of keeping a concurrent chest pain diary on later recall of the same chest pain was analyzed for completeness of reporting and accuracy.

Thirty-one subjects with angina, who were scheduled for cardiac catheterization, were recruited from a private cardiology practice. Twenty-three men and eight women, ages 43 to 76 years, were randomly placed in experimental ($n=16$) and control ($n=15$) groups. The groups were similar with regard to background variables, except that the experimental group tended to have diagnosed coronary artery disease longer than the control group ($p=0.09$).

Following an initial interview about chest pain episodes, the experimental group received the Chest Discomfort Diary to complete for each subsequent chest pain episode that occurred during the next 7-10 days. This diary asked for assessment of eight categories of information about their chest pain: frequency, activity, mood, duration, intensity, descriptors, location, and treatment. Both groups were interviewed at the end of the treatment period about a specific typical episode of chest pain. Subjects who had no pain during the 7-10 days were asked to describe pain experienced prior to the first interview.

Experimental subjects recalled their chest pain more completely than controls ($p=.009$), whether or not they had pain during the study period. Experimental subjects ($n=11$) who had pain and used the diary were most accurate in categories of pain duration, intensity, description, and treatment; they were least accurate regarding frequency and mood. Use of a concurrent diary offers one method of teaching patients how to report their chest pain symptoms, and can improve the completeness and accuracy of those reports.