L

This is to certify that the

dissertation entitled

EFFECTS OF A PSYCHOEDUCATIONAL INTERVENTION ON PAIN PERCEPTIONS, HEALTH BEHAVIOR, AND PSYCHOLOGICAL DISTURBANCE IN CHRONIC PAIN PATIENTS

presented by

Joseph Alex Jeney

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in *Counseling Psychology*

Major professor
William E. Hinds

Date *May 3, 1985*

MSU is an Affirmative Action/Equal Opportunity Institution

O-12771

8-28-91

EFFECTS OF A PSYCHOEDUCATIONAL INTERVENTION ON PAIN PERCEPTIONS, HEALTH BEHAVIOR, AND PSYCHOLOGICAL DISTURBANCE IN CHRONIC PAIN PATIENTS

By

Joseph Alex Jeney

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Counseling, Educational Psychology,
and Special Education

1985

ABSTRACT

EFFECTS OF A PSYCHOEDUCATIONAL INTERVENTION ON PAIN PERCEPTIONS, HEALTH BEHAVIOR, AND PSYCHOLOGICAL DISTURBANCE IN CHRONIC PAIN PATIENTS

By

Joseph Alex Jeney

This study investigated the impact of a psychoeducational intervention for health care decision making and personal problem solving, the Personal Paradigm Shift (Hinds, 1983), on pain perceptions, health care behaviors, and psychological disturbance in chronic pain patients. The research is based in the educational model of service delivery and the concept of psychoeducation (Larson, 1984). The Personal Paradigm Shift was used to determine its effectiveness in (a) reducing chronic pain perceptions, (b) promoting a higher incidence of health care behavior, (c) modifying certain types of psychological disturbance toward "normality," and (d) encouraging the maintenance of treatment gains.

Twelve groups of patients (total <u>N</u> = 51) in a multidisciplinary pain clinic were randomly assigned to one of two treatments: training in the structured Personal Paradigm Shift intervention, or group discussion about stress and pain management. Treatment was administered during the 1-week clinic stay. All groups received the customary treatments for chronic pain. The design of the study was a pretest-posttest control group design with follow-up measures.

Subjects completed the McGill Pain Questionnaire, a measure of pain perception, at pretest, posttest, and 3-month follow-up. Subjects also completed the Minnesota Multiphasic Personality Inventory (MMPI) and Lifestyle Coping Inventory (Hinds, 1983), a measure of health behavior performance, at pretest and 3-month follow-up. Follow-up measures were collected by mail, and an 80% ($n = 41$) return rate was obtained, with equivalent mortality in each of the treatment groups.

The group, not the individual, was the unit of analysis, and analyses were performed on gain scores obtained from pretest-posttest and pretest-follow-up comparisons. A multivariate analysis of variance was performed on the pain data and found to be nonsignificant for both the pretest-posttest comparison ($p > .05$) and the pretest-follow-up comparison ($p > .05$). A multivariate analysis of variance was used on four scales of the MMPI (Hypochondriasis, Depression, Hysteria, and Psychasthenia) and was found to be nonsignificant ($p > .05$). A one-way analysis of variance was performed on the health behavior data and was found to be nonsignificant ($p > .05$). Chi-square tests on each of six behavioral outcome measures collected at follow-up were also each found to be nonsignificant ($p > .05$).

A discussion of reasons for lack of support of the hypotheses and directions for further research were offered.

To my loving wife, Marilyn.

T

Tc

Tc

Tc

Tc

Tc

Tc

ACKNOWLEDGMENTS

To Bill Hinds, who shared his understanding of behavior change dynamics with me and who helped me to carve out a niche for myself, I am very grateful.

To Rochelle Habeck, Dozier Thornton, and Richard Houang, who helped me to critically view my work from perspectives that had not occurred to me.

To John Jerome, for his generosity with his time and energy, and teaching me his vast knowledge of the chronic pain experience.

To Andy Porter and Steve Roudenbusch, for helping me realize that there are several ways to view an analysis problem.

To Randy Fotiu, who performed an expert job of the computer analysis of of the data in this study.

To Margaret Parsons, "my editor" (I always wanted to say that), who taught me the value of plain English.

To Sue Cooley, for a fast, professional typing job amidst an onslaught of dissertation mania.

To Kiersten, Ryan, and Marisa, for understanding my physical and psychological absence during this task; I intend to make it up to you.

To Rich Dombrowski, Norm Gilbert, Greg Holmes, Tom McIntyre, Dick McQuellon, Dave Minden, Romy Valdez, Chip West, and Jackie Williams, for your lasting friendship.

To the Bluesmobile and its regular passengers, this one's for you!

To Marilyn, for tolerating the variety of neurotic behavior I displayed. You were a stable presence for me to lean on. You shared with me your sense of optimism, and you believed in me.

TABLE OF CONTENTS

Page

LIST OF TABLES viii

LIST OF FIGURES x

LIST OF APPENDICES xi

Chapter

1. INTRODUCTION 1

Introduction 1
Need 3
Purpose 5
Research Hypotheses 6
Theory 7
Overview 10

2. REVIEW OF LITERATURE 12

Conceptual Features of Psychoeducational Interventions 12
Role of Psychologist-as-Educator 13
General Behavior Change Manuals 16
Personal Problem-Solving Programs 22
Cognitive Processes in Problem Solving 26
Coping Skills Training 27
Self-Control 31
Psychology of Chronic Pain 33
Psychological Interventions for Chronic Pain 36
  Operant Treatment of Chronic Pain 37
  Cognitive-Behavioral Interventions for Chronic Pain 39
  Physiological Interventions for Chronic Pain . . . 41
Follow-Up Studies of Multicomponent Pain Clinics . . 42
Summary 48

Page

3. METHODOLOGY 53

Description of Personal Paradigm Shift 53
  Stage 1: Awareness 56
  Stage 2: Decision Making 58
  Stage 3: Oppositional Alternatives 59
  Stage 4: Treatment Planning and Action 61
  Summary of the Personal Paradigm Shift 64
Sample 65
Instrumentation 70
  Description of McGill Pain Questionnaire 70
  Minnesota Multiphasic Personality Inventory 74
  Description of the Shipley Institute of Living Scale 80
  Lifestyle Coping Inventory 81
Behavioral Outcome Measures 83
Procedures 83
  PPS Group 85
  Discussion Group 87
Design 88
Hypotheses 89
Analysis of Data 91
  Group as Unit of Analysis 91
  Use of Raw Gain Scores 92
  Statistical Procedures 93
Summary 94

4. ANALYSIS OF RESULTS 97

Follow-Up Return Rate 97
Results 99
  Hypothesis 1 99
  Hypothesis 2 105
  Hypothesis 3 107
  Hypothesis 4 110
  Hypothesis 5 115
Summary 118

5. SUMMARY AND CONCLUSIONS 120

Summary 120
Discussion 125
  Pain Perceptions 126
  Health Care Behavior 127

Page

Characteristic Psychological Disturbance 128
The Process of the Personal Paradigm Shift 131
Limitations of the Study 134
Implications for Further Research 138

APPENDICES 142

REFERENCES 166

3

3

4

4

4

4.

4.

4.

4.

4.

LIST OF TABLES

Table Page

3.1 Age of Subjects 67

3.2 Race of Subjects 67

3.3 Sex of Subjects 68

3.4 Marital Status of Subjects 68

3.5 Years of Education of Subjects 68

3.6 Work Composition of Subjects 69

3.7 Estimated WAIS IQ's of Subjects 69

3.8 Test-Retest Reliability Coefficients Reported for the MMPI 75

4.1 Size of Groups at Each Measurement Point 98

4.2 Mean McGill Pain Ratings at Pre-, Post-, and Three-Month Follow-Up for Experimental and Control Groups . 101

4.3 Mean Gain Scores (Pretreatment-Posttreatment) on McGill Pain Ratings for Experimental and Control Groups 103

4.4 Results of ANOVA on Pre-Post Sensory Pain Measure . . . 104

4.5 Results of ANOVA on Pre-Post Affective/Evaluative Pain Measure 104

4.6 Results of ANOVA on Pre-Post NWC Pain Measure 104

4.7 Mean Gain Scores (Pretreatment-Follow-Up) of McGill Pain Ratings for Experimental and Control Groups . . 105

4.8 Results of ANOVA on Pre-Follow-Up Sensory Pain Measure 106

4.9

4.1

4.1

4.1

4.1

4.1

4.1

4.1

4.1

4.1

4.1

Page

4.9 Results of ANOVA on Pre-Follow-Up Affective/Evaluative Pain Measure 107

4.10 Results of ANOVA on Pre-Follow-Up NWC Pain Measure . . 107

4.11 Mean Total Lifestyle Coping Inventory Scores at Pretreatment and Follow-Up for Experimental and Control Groups 109

4.12 Gain Score Data on Lifestyle Coping Inventory for Pretreatment-Follow-Up Comparison for Experimental and Control Groups 110

4.13 Mean MMPI T-Scores at Pretreatment and Three-Month Follow-Up for Experimental and Control Groups 111

4.14 Mean MMPI Profiles at Pretreatment and Three-Month Follow-Up for Experimental and Control Groups 112

4.15 Mean Gain Scores (Pretreatment-Follow-Up) on MMPI Scales for Experimental and Control Groups 113

4.16 Results of ANOVA on Pre-Follow-Up Hypochondriasis Scale 114

4.17 Results of ANOVA on Pre-Follow-Up Depression Scale . . 114

4.18 Results of ANOVA on Pre-Follow-Up Hysteria Scale . . . 115

4.19 Results of ANOVA on Pre-Follow-Up Psychasthenia Scale . 115

F

3

4

4

LIST OF FIGURES

Figure		Page
3.1	Overall Design	90
4.1	Mean Sensory Pain Score of PPS and Discussion Groups at Three Measurement Points	102
4.2	Mean Affective/Evaluative Pain Score of PPS and Discussion Groups at Three Measurement Points . .	102
4.3	Mean Number of Words Chosen Pain Score of PPS and Discussion Groups at Three Measurement Points . .	102

LIST OF APPENDICES

Appendix Page

A. ESTIMATED WAIS IQ VALUES USING SHIPLEY INSTITUTE OF LIVING SCORES FOR EXPERIMENTAL AND CONTROL GROUPS 143

B. FOLLOW-UP QUESTIONNAIRE 145

C. McGILL PAIN QUESTIONNAIRE 148

D. SHIPLEY INSTITUTE OF LIVING SCALE 151

E. LIFESTYLE COPING INVENTORY 154

F. INFORMED CONSENT FORM 164

CHAPTER 1

INTRODUCTION

The Problem

Thirty years ago, Sanford (1955) first called for a shift from a "healing" orientation to a "teaching" orientation in the delivery of psychological services, stating that "it is a practical necessity for psychology to take definite steps to insure that technical knowledge about human beings is made widely available to human beings" (p. 833). Nine years later, Hobbs (1964) hailed "mental health's third revolution," pointing to an emerging change from a clinical to an educational model. Later, Miller (1969), in his presidential address to the American Psychological Association, affirmed strongly the need for "giving psychology away" to the public. Psychologists have continued to recognize the need for a fundamental shift to a skills-training paradigm in the delivery of human services (Larson, 1984).

During the past 15 years a number of practitioners have given additional impetus to the psychologist-as-educator model (Authier, Gustafson, Guerney, & Kasdorf, 1975; Guerney, Guerney, & Stollak, 1971/72; Guerney, Stollak, & Guerney, 1970, 1971; Larson, 1984; Mosher & Sprinthall, 1971). In contrast to the traditional medical or illness model, this new model provides for an educational orientation in the delivery of human services. Psychoeducation involves the teaching of personal and interpersonal attitudes and skills which the person can apply to solve present and future psychological problems and enhance his/her own and others' satisfaction with life (Guerney et al., 1970). The educational model calls for psychologists to teach personal and interpersonal skills and competencies to people previously lacking in these skills. The psychologist assumes the role of educator, teacher, or consultant, and the person being served is considered a pupil rather than a patient.

Although the movement to teach personal and interpersonal skills has gained momentum in the educational system (Brown, 1971; Colley, 1975; Ivey & Alschuler, 1973; Mosher, 1977), it has been relatively neglected in the health care system. Although many stress management and self-help manuals provide coping information to health care recipient groups, these programs are useful only when coping failure is due to simple lack of knowledge (Lazarus & Folkman, 1984). The educational model, in addition to providing information about the consequences of stress, includes teaching life skills and encouraging competency in personal problem solving and health care decision making.

During the last decade, the treatment of chronic pain has become a major area in health care (Melzack, 1973; Melzack & Wall, 1982; Sternbach, 1974; Turner & Chapman, 1982a, 1982b). Pain is undoubtedly the most significant and perhaps the most common problem with which the patient confronts the physician. Various medical and psychological interventions have been employed with differing degrees of success in the treatment of chronic pain patients. Health care professionals

clearl
behavi
safely
person
(Stern

Re
chronic
& Wall,
treatme
observe
that in
chronic
persona
regimen
researc
decisio
changes.
program,
and incr

The
patients
an ever-
costly ar
psychophy

clearly recognize that pain is a complex phenomenon with physical, behavioral, and psychological components. Patients who cannot be safely treated with medical or surgical interventions need to develop personal skills and competencies in order to live with their pain (Sternbach, 1974).

Recent advances in the medical and psychological treatment of chronic pain have been beneficial to those who live with pain (Melzack & Wall, 1982; Sternbach, 1974; Roy & Tunks, 1982). However, these treatments have not provided patients with a model for learning how to observe, experience, and determine their own behavioral choice process that influences personal health care. An intervention that teaches the chronic pain patient skills for health care decision making and personal behavior change can be a useful adjunct to the treatment regimen. With the educational intervention model presented in this research, chronic pain patients can learn a process for making sound decisions about their health care and for instituting positive behavior changes. This process will complement the goals of a pain management program, extend the benefits of the program to the natural environment, and increase the patient's satisfaction with life.

Need

The need for a psychoeducational intervention for chronic pain patients can be demonstrated from four observations. First, there is an ever-growing number of pain patients whose health care is extremely costly and who are resistant to the traditional medical, physical, and psychophysiological treatments for relief of pain (Steger & Fordyce,

1972).
cost of
the acc
Enders,
that as
minimu
Stemba
disabil
payment
problem

A

mainten
pain pa
immedia
rates a
that the
the bene

Non

health c
this stu
chronic
tic and
and 93%
and at le
term reg

1972). Only 8 years ago, it was estimated that the annual health care cost of chronic pain in the United States was $13 billion, excluding the additional costs of compensation and lost wages (Aronoff, Evans, & Enders, 1983). The National Institute of Health (NIH) has estimated that as many as 15 million adults suffer from low back pain with a minimum of 93 million work days lost every year (Aronoff et al., 1983). Sternbach, Wolf, Murphy, and Akeson (1973) observed that back-related disabilities are responsible for nearly 20% of all compensation payments made in a given year and are the single most costly health problem in industry today.

A second factor suggesting the need for this study is the poor maintenance of improvement rates following treatment of the chronic pain patient (Painter, Seres, & Newman, 1980). Although change immediately following treatment may be quite good, long-term success rates are much worse, frequently below 30% (Loeser, 1974). It is clear that these patients require additional intervention in order to retain the benefits from the pain clinic in the natural environment.

Noncompliance with treatment regimens, long a nagging problem for health care professionals, is the third factor indicating a need for this study. Approximately 85% of chronic health problems, including chronic pain, are partially the result of noncompliance with therapeutic and preventive treatments (Sackett & Haynes, 1976). Between 15% and 93% of patients fail to comply with medical regimens of all types, and at least one-third of all patients fail to comply with even short-term regimens (Becker & Maiman, 1975). An educational intervention can

provi
self-
emphas
that r
be ben

A
clinic
Goldfr
proble
defici
effort.
Shure (
defici
interpe
to stre
group
(Sternb
Thus, t
can the
problems

The
determin
Personal

provide the patient with the skills necessary to involve the patient in self-care and personal behavior change. This intervention would not emphasize compliance, but internalization, defined as a behavior change that results from the realization that a change to a new pattern will be beneficial and worthy of acceptance (Suedfeld, 1982).

A fourth observation that marks the need for this study is that clinical groups are typically poor problem solvers (D'Zurilla & Goldfried, 1971). McGuire and Sifneos (1970) called for teaching problem-solving skills to psychotherapy patients, stating that the deficit in learning with regard to solving internal conflicts blocks efforts to initiate personal change. Similarly, Spivack, Platt, and Shure (1976) stated that many psychiatric groups display developmental deficits in means-end thinking, a skill necessary to solve personal and interpersonal problems. They suggested a direct educational approach to strengthen these cognitive processes. Chronic pain patients, a group which often exhibits a variety of psychological disturbances (Sternbach, 1974), can benefit from a problem-solving perspective. Thus, their pain symptoms constitute problems to be solved, and they can then learn the psychological skills necessary to manage these problems.

Purpose

The purpose of the research reported in the present study was to determine the impact of a specific psychoeducational intervention, the Personal Paradigm Shift (Hinds, 1983), on the health of chronic pain patt

incl

want

this

in d

modi

chro

size

pain

decis

pain

decis

pain

decis

the c

and he

gains

enviro

patients. In this study health is defined as a state of equilibrium, including physical and psychological well-being, that people maintain or want to restore when it is disrupted (Herzlich, 1973). Specifically, this research explored the effectiveness of the Personal Paradigm Shift in decreasing pain perceptions, encouraging health care behavior, and modifying characteristic psychological disturbance in patients with chronic pain.

Research Hypotheses

A number of research questions were formulated. It was hypothesized that:

1. A psychoeducational intervention designed to teach chronic pain patients concepts of personal problem solving and health care decision making will decrease perceptions of chronic pain.
2. A psychoeducational intervention designed to teach chronic pain patients concepts of personal problem solving and health care decision making will promote the performance of health care behaviors.
3. A psychoeducational intervention designed to teach chronic pain patients concepts of personal problem solving and health care decision making will modify characteristic psychological disturbance in the direction of normality.
4. Chronic pain patients who are taught personal problem solving and health care management concepts will maintain positive behavior gains after leaving the pain clinic and returning to their natural environment.

Theory

Psychoeducation and skills training are outgrowths of the educational model in psychology, a model that emerged as an interface of the fields of psychology and education. The principles of the educational model are contrary to the fundamental tenets of the illness or medical model, historically the dominant model in psychology. According to the educational model, the client seeks services from a psychological practitioner because of some perceived "dissatisfaction" or "ambition" (Authier et al., 1975). The practitioner assists the client in a goal-setting process and teaches the client a specific set of skills, ideally resulting in client satisfaction and goal achievement. The illness model presupposes that the patient arrives for treatment with some "abnormality" or "illness" and the practitioner engages in the process of diagnosis, prescription, and therapy. If the therapy is successful, the patient is cured.

The role of the treatment participant in treatment is defined differently in each model. In the educational framework, the participant is a pupil, or trainee, and the practitioner is an instructor or teacher (Authier et al., 1975; Guerney et al., 1970, 1971, 1971/72; Larson, 1984). The domain of the psychological educator is the affective, behavioral, and interpersonal. In the illness model, the relationship is between a therapist and a patient.

A definitive statement outlining the theoretical underpinnings of psychoeducation has not yet been developed because a shift from the psychologist as therapist to the psychologist as teacher has not occurred (Authier et al., 1975). Thus it is difficult to trace with certainty the historical patterns which would have brought this shift about. There are, however, several theoretical assumptions that serve as the foundation for psychoeducation and skills training.

The first factor, the foundation for viewing the psychological practitioner as teacher, is that the most important aspects of human behavior result from experience and not from the unfolding of genetic predisposition or instinct (Authier et al., 1975). This principle is such a pervasive part of psychology that to pinpoint exact points of origin is not possible. Freud's insistence on the importance of life experiences in shaping behavior was crucial throughout his theory of human development. The emergence of a learning theory approach was highlighted by Watson's (1916) belief that human attitudes, values, and behaviors are extremely malleable, given proper environmental manipulations. Forty years later, Wolpe (1958) proposed that learning was what receiving psychological help was all about. This view of therapy as a process of learning paved the way for the idea that teaching plays a major role in providing psychological help. Several major historical figures have viewed the psychologist as a teacher (Dollard & Miller, 1950; Mowrer, 1950; Rotter, 1954).

A second historical factor was instrumental in the development of psychoeducation. This was the public's acceptance of its need for psychological services, coupled with the profession's awareness that this need would remain unmet if the model for delivery of these services was not significantly altered. Rogers (1951) was among the first to encourage psychologists to break way from the medical model. Along with Skinner (1953), he introduced two cornerstone theoretical concepts of psychoeducation, "proper interpersonal climate" and "appropriate skill training."

The concept of proper interpersonal climate refers to the practitioner's willingness to respect clients and encourage them to choose their own goals. This includes, as well, a high degree of respect for the client's own ability to reach these goals, given appropriate environmental circumstances. Rogers believed that clients themselves have the best aptitude for solving their own problems and the right to do so. Larson (1984) has affirmed these ideas, stating that a key assumption of psychoeducation is that clients are seen as capable of directing their own learning rather than being passive recipients of treatment.

Appropriate skill training means that psychologists must use their expertise to design a program of personal or interpersonal content that best fits the client's needs. Skinner (1953) advanced the attitude that if things were not working out well for the client in treatment, the helper must be the first to change strategies, not the client. With the introduction of Skinnerian behavior modification, the skills training movement was strengthened by making it desirable to target special behavioral objectives and to develop effective teaching strategies for accomplishing these objectives.

Intentionality, also called responsiveness, is another central concept in understanding the theoretical basis of psychoeducation.

Ivey an
articip
desire
only on
observe
situat
specifi
psychoe
that ge
build c

Al
the lit
matic m
making.
adjunct
treatme
tion in
Personal
patients
behavior

In
followin
interven
skills t

Ivey and Alschuler (1973) defined intentionality as the capacity to anticipate alternative experiences, choose among them, and attain desired goals. People who behave intentionally are seldom faced with only one solution to a problem. Likewise, Drum and Knott (1977) observed that there is a benefit from learning "responsiveness" to life situations as opposed to merely learning a discrete response to a specific situation. These practitioners suggested that the goal of psychoeducation is to teach people personal and interpersonal skills that generalize to a wide range of future situations. The goal is to build competence through skills acquisition.

Although numerous psychoeducational interventions are reported in the literature, none has provided health care recipients with a systematic model for personal behavior change and health care decision making. Furthermore, no research has explored the potential of an adjunctive psychoeducational intervention to a traditional medical treatment regimen in extending the benefits accrued through participation in a multicomponent chronic pain program. In this research, the Personal Paradigm Shift (Hinds, 1983) is employed with chronic pain patients to determine its effect on pain perceptions and health care behavior.

Overview

In Chapter Two, the relevant literature is reviewed in the following areas: existing behavior change and problem-solving interventions, the concept of self-control and its outgrowth, coping skills training, the concept and the psychology of chronic pain, and the efficacy of psychological treatments for chronic pain with an emphasis on follow-up studies of multicomponent chronic pain programs. A description of the Personal Paradigm Shift (PPS), the research design, instrumentation, and procedures are presented in Chapter Three. In Chapter Four, the analyses of the results are presented. Conclusions and implications for further research are presented in Chapter Five.

CHAPTER 2

REVIEW OF LITERATURE

In the following review, four areas of research are examined. First, a review of psychoeducational interventions is presented with a particular focus on general life skills, behavior change training manuals, and problem-solving training. Second, there is a brief summary of the related concepts of self-control and self-management, along with a discussion of their conceptual outgrowth, coping skills training. A section on the psychology of chronic pain is then presented. In the final portion of the review, there is consideration of psychological interventions used in the treatment of chronic pain and a focus on follow-up studies of multicomponent chronic pain programs.

Conceptual Features of Psychoeducational Interventions

During the past few years educators have developed renewed interest in a philosophy of education that emphasizes the facilitation of the personal development of the individual. This area of study, variously referred to as personal education, affective education, humanistic education, psychological education, self-management, or psychoeducation, is defined as the teaching of personal and interpersonal skills to people previously lacking in such skills.

Practicing psychologists have been called on to include psychoeducation among their areas of concentration in order to better serve the psychological needs of the community. A movement has taken form to abandon the medical model of service delivery and replace it with a model that gives people personal and interpersonal psychological skills.

Interventions that emerge from the psychoeducational model rest on three basic assumptions (Larson, 1984). The first assumption is that the practitioner becomes a teacher to the patient or client. Although many thinkers have identified psychotherapy as a learning process, they have failed to acknowledge the corollary that the therapist is a teacher (Guerney et al., 1970, 1971). Under the second assumption of the psychoeducational model, clients' problems are viewed as skill or competency deficits rather than as abnormalities or illnesses. Skills training therapists argue that clients are actually lacking something that must be "added to" the client through training. The third assumption of the psychoeducational model is that by labeling problems as competency deficits rather than as illnesses, the active participation of clients in solving their own problems is enlisted. A client who is taught problem-solving skills is in a better position to solve many different problems in diverse situations.

Role of Psychologist-as-Educator

Perhaps the most lucid statement regarding the role of the psychologist who follows an educational model was offered by Guerney and his colleagues (1970, 1971/72), describing the psychologist as one whose work:

> would derive directly or indirectly not with curing neurosis, not with eliminating symptoms, and not with intellectual growth per se, but with teaching personal and interpersonal attitudes, concepts and skills which the student (client) can apply, presently and in the future, to enhance his/her and others' satisfaction with life. (p. 239)

These authors emphasized that adopting an educational orientation to psychological practice does not mean intellectualization of practice, but rather that full consideration of dynamic factors in understanding behavior is also necessary.

The role of the psychologist as a skills trainer was further clarified by Ivey and Alschuler (1973), who defined three statements of "intent" that characterized this new role. First, they stated that a goal of psychological education is to increase the individual's intentionality, the capacity to anticipate alternative experiences, choose among them, and attain desired goals. Second, intentionality should be taught in the most inclusive and effective ways possible, a focus on the strategies of the psychoeducational specialist. The final statement of intent of the psychologist-as-educator is to "demystify" the helping process by teaching skills to the widest audience possible.

A number of writers have contrasted the role of the psychologist following an educational model with the role of the psychologist following a traditional illness or medical model (Authier et al., 1975; Goldstein, 1981; Guerney et al., 1970, 1971/72; Larson, 1984). Viewing the client in educational terms assumes that the individual is deficient in skills necessary for effective and satisfying daily living.

This is a different assumption than that of the psychodynamic/ psychoanalytic, humanistic, or behavior modification approaches, which all assume that the patients have within themselves effective or healthy behaviors which can be uncovered through therapy. According to all three approaches, these latent behaviors can be realized by the patient if the therapist is sufficiently skilled in removing the obstacles to such realization. In contrast, the task of the skills trainer is the active and deliberate teaching of desirable behaviors, rather than the removal of obstacles to already existing behaviors.

Drawing this same contrast between the psychologist functioning under the illness model and one functioning within the framework of the educational model, Guerney and his colleagues (1970, 1971/72) observed that there is a shift from passively undoing the negative in the illness model to actively developing the positive in the educational model. Furthermore, from the educational view, the psychologist has a didactic emphasis, introduces more structure to the procedures, and has much less flexibility than in traditional therapy procedures. Personal and interpersonal skills require instruction, self-disciplined practice, and feedback in order to develop. The psychologist-as-educator takes on the responsibility only for teaching the skills which he/she believes will allow clients to solve their own problems

Certain conceptual shifts occur as the psychologist moves from a medical model to an educational model (Guerney et al., 1971). First, there is a shift from covert to overt value judgments. Following an educational model, the psychologist may clearly advocate certain values over others, on the basis that the person is being taken from a "sick" to a "well" behavior. A second conceptual shift is that there is a movement from a case orientation to programmatic planning. The psychological educator stakes out an area of knowledge or skill and designs a course, a program for teaching, to reach the widest possible group to be served. The final major conceptual shift is a shift in the place of personality assessment, from a position of primary importance in the helping process to one of secondary importance; and from general to specific objectives in assessment. The educator takes skills deficits for granted when implementing the program rather than spending time determining what is wrong with the client (Guerney et al., 1971).

Now that the major assumptions and characteristic features of psychoeducation and skills training have been outlined, a discussion of several specific psychoeducation programs will be presented. This review is a representative rather than an exhaustive summary of general behavior change programs.

General Behavior Change Manuals

A number of manuals exist that instruct trainees in the general principles and strategies of behavior change. These manuals have been variously termed general instructional manuals (Glasgow & Rosen, 1978, 1979), life skills manuals (Egan, 1975), and psychosocial coping skills manuals (Larson, 1984). These general behavior change manuals are to be distinguished from the proliferation of self-help manuals that teach people to solve specific behavioral problems, such as sexual dysfunctions, assertiveness problems, and weight problems.

General behavior change programs are categorized into four levels of therapist involvement: self-administered by the trainee, minimal contact with trainee, therapist administered, and therapist directed. These manuals have generally not been validated in any systematic manner, and no studies employing placebo and treatment controls have been reported (Glasgow & Rosen, 1978). This review addresses common features of these general instructional materials.

Most general behavior change manuals are written from a behavioral point of view. These manuals usually instruct the reader or trainee through a four-stage behavior change process: (a) specify a behavior requiring change, (b) set goals and develop a self-change contract, (c) self-monitor the target behavior's frequency of occurrence, and (d) rearrange relevant antecedents and consequences within an operant learning framework (Glasgow & Rosen, 1978, 1979). These materials have much potential in terms of cost effectiveness because clients learn a set of principles that can be applied to a variety of problems rather than learning a new set of procedures for each behavior change desired.

Perhaps the best known and most frequently used manual of general behavior change principles is the program designed by Watson and Tharp (1977), a guidebook for self-change that relies heavily on operant methods and vicarious learning principles. Their manual is the only one found that has been validated with systematic research (Barrera & Glasgow, 1976). Exercises for developing skills in self-analysis and information about how to achieve personal goals are provided. The authors described the following steps in self-direction: (a) selecting a goal; (b) specifying the behaviors needed to change in order to reach the goal (target behaviors); (c) making observations about those target behaviors (self-knowledge); (d) working out a plan for change which applies basic psychological knowledge, either gradually replacing an unwanted action with a desired one or arranging to be rewarded for certain behaviors; and (e) readjusting plans based on increased self-knowledge. Each of these steps is now considered in more detail.

Individuals begin the first step in the behavior change process, selecting a goal, by thinking of a way they would like to either begin behaving or stop behaving. Therefore, selection of a goal involves the identification of either a behavior deficit or a behavior excess. Step 2, identifying target behaviors, involves specifying a set of behaviors that impede progress toward the goal one wishes to achieve. In Step 3, the individual is asked to keep a diary of the antecedents and consequences of the target behaviors. Step 4, the basic techniques for achieving self-direction and working out a plan for change, involves rearranging consequences through procedures of reinforcement, extinction, and punishment. Undesirable behaviors are eliminated by finding some incompatible, desired behavior that can be increased by positive reinforcement. Sometimes self-direction involves identifying, rearranging, and controlling the antecedents of behavior. In summary, personal change is a process that occurs once an individual understands how to manipulate the sequence of antecedents-behavior-consequences for a personal problem.

Another general behavior change program based on principles of behavior modification was developed by Williams and Long (1979). In many ways their model for behavior change is similar to the model proposed by Watson and Tharp (1977). Williams and Long emphasized a basic principle of psychoeducation--that adequate information about the process of behavior change can provide the motivation that people need in order to change. Their model consists of five steps. In Step 1, selecting a goal, the authors argue that the importance of the goal, the measurability of the goal, and the level of the goal are each factors that require consideration. The first factor, importance of the goal, suggests that selecting a goal that requires the elimination of long-standing behaviors may result in failure of the program and make it difficult to remain motivated. The second factor, measurability, means that it is imperative that nonbehavioral goals, e.g., "I want to feel better about myself," be translated into measurable terms. The final factor in selecting a goal, a person's awareness of the level of a goal, refers to the rule that a stated goal should be only slightly higher than the person's present level of functioning. The next three steps of the program, monitoring target behaviors, changing setting events, and establishing effective consequences, are all based on operant principles and involve manipulation of the antecedents-behavior-consequences paradigm. The final step of the program, consolidating gains, encourages the person to make the transition from artificial support to natural support gradually, maintaining reinforcement contingencies as a natural part of daily routine. Interestingly, the authors noted that in many cases merely selecting a goal or the combination of selecting a goal and monitoring target behavior is all that is necessary to modify a behavior.

In summary, behavior change programs that follow an operant learning orientation are based on the premise that there are orderly relationships between a person's behavior and the external environment. Behavior change occurs by altering the environment in two ways: first, by altering the events that precede particular "target" behaviors, and second, by altering events that follow "target" behaviors. These programs follow the antecedents-behavior-consequences paradigm and instruct the person in ways to manipulate the separate components of the paradigm.

Drawing extensively on Bandura's (1969) social learning theory, Goldstein (1981) developed an approach to psychological skill training called the "Structured Learning Technique," a program tailored to fit the needs and lifestyles of lower-class individuals. Therefore, the program is brief, concrete, behavioral, and authoritatively administered. Goldstein defined psychological skills training as "the planned, systematic teaching of the specific behaviors needed and consciously desired by the individual in order to function in an effective and satisfying manner, over an extended period of time, in a broad array of positive, negative, and neutral interpersonal contexts" (p. 3). Both personal and interpersonal skills constitute the content of psychological skills training programs. Primarily, the principles of modeling, role playing, and performance feedback are drawn upon in this approach. Patients are provided with specific, detailed, frequent, and vivid displays of adaptive behavior or of specific skills in which they are deficient (modeling); given considerable opportunity and encouragement to behaviorally rehearse or practice such modeled behavior (role playing); provided with positive feedback, approval, or regard for successful enactments (performance feedback); and required to engage in a number of behaviors that enhance the likelihood that there will be generalization of behavior (transfer of training).

A behavior change manual that introduces several concepts not found in the operant-based programs is Cudney's (1975, 1976) "elimination of self-defeating behaviors" model. The main contribution of this program is the idea that fear provides the energy for maintaining self-defeating behaviors. Five elements operate in combination to continue a self-defeating behavior pattern: choice, fear, techniques, disowning, and minimizing. A person is constantly making choices at each stage of development, and these choices can maintain self-defeating behaviors. Fear, the second element in this model, energizes self-defeating behavior and is probably unconscious. A major step in overcoming the self-defeating behavior cycle is to become conscious of fear. Techniques refer to the actions taken, the methods employed, and the more obvious behaviors used by a person to continue a self-defeating behavior pattern, a pattern Cudney believed is generally easy to identify. The fourth element, disowning, is the person's tendency to blame or project responsibility for the consequences of the self-defeating behavior onto something or someone else, thus relieving the individual of control or responsibility. Methods of disowning can be clarified by creating a "blame list." Minimizing, the final element of the model, occurs when the person ignores or minimizes the severity of the consequences of the self-defeating behavior. Cudney stated that the person is unaware that the entire self-defeating behavior pattern results in being paid off with the very consequences that are feared.

Personal Problem-Solving Programs

Numerous illustrations of personal problem-solving programs are found in the literature (Carkhuff, 1976; Dixon, Heppner, Petersen, & Ronning, 1979; D'Zurilla & Goldfried, 1971; Goldfried & Davison, 1976; Goldfried & Goldfried, 1975; Heppner, 1978; Mahoney, 1974; McKay, Davis, & Fanning, 1981; Redd & Sleaton, 1976; Rudestam, 1980; Schmidt, 1976; Spivack, Platt, & Shure, 1976). Although these programs consist of elements that are comparable to the features of general behavior change programs, they are labeled specifically as "problem-solving" methodologies in the literature and therefore are presented separately here.

Problem solving was defined by Goldfried and Goldfried (1975) as a behavioral process, whether overt or cognitive in nature, which (a) makes available a variety of potentially effective response alternatives for dealing with the problem situation and (b) increases the probability of selecting the most effective response from among these various alternatives. In problem-solving training, the goal is not to provide specific solutions to specific problem situations but to provide a general coping strategy for future situations.

scl
195
a d
hea
pro
dis
pro
suc

the
An
Gol
pro
for
(e)
bel

pro
sit
and
nor
act
to
inh

The link between the individual's ability to employ a problem-solving process and psychological health has been addressed (Jahoda, 1958). The sequential ability to admit to a problem, consider it, make a decision, and take action is viewed as a feature of positive mental health. Jahoda added that an important affective element in this process is the ability to tolerate the strain involved and to feel dissatisfied until some resolution emerges. It is the process of problem solving itself that is important, rather than simply finding a successful resolution, that is the indicator of positive adjustment.

While there is no single agreed-upon model of problem solving, there are several common stages or behaviors postulated in most models. An excellent example of the problem-solving models was presented by Goldfried and Goldfried (1975). Five sequential stages comprise their program: (a) general orientation, (b) problem definition and formulation, (c) generation of alternatives, (d) decision making, and (e) verification and evaluation. Each stage is considered in detail below.

General orientation, the initial step in the problem-solving process, is the attitude with which one approaches the problem-solving situation. Four aspects of orientation were highlighted by Goldfried and Goldfried. First is a recognition that problem situations are a normal aspect of living. The second aspect is the belief that one can actively cope with such problem situations. Third, one must be ready to recognize problem situations as they occur. Finally, one begins to inhibit the temptation to act in an impulsive way to solve the problem.

Once a person has acquired a useful attitudinal set toward problems, the second step of problem solving can begin. In this step, problem definition and formulation, various aspects of the problem are defined in concrete, operational terms. Rudestam (1980) suggested that the person should determine whether the problem is primarily affective, cognitive, behavioral, or a combination of all three. He also recommended that the person assess whether the problem is one of behavioral excess or deficit. As in the general behavior change programs, the situational context of the problem is explored fully, and antecedents and consequences of the problem are identified. In short, the step of problem definition and formulation involves collecting reliable information about the problem itself. Kanfer and Saslow (1969) outlined several guidelines useful in this behavioral diagnosis of a problem. These include identifying the people who object to and support the problem, understanding what ramifications the problem has for the person and those close to the person, and identifying the satisfactions the person will continue to have if the problem remains. In addition, Kanfer and Saslow (1969) suggested that individuals examine the consequences that removal of the problem would have for them or for significant others.

Generation of alternatives, the third step in the problem-solving process, primarily involves the technique of brainstorming (Dixon et al., 1979; Goldfried & Goldfried, 1975; Heppner, 1978). In brainstorming, the person attempts to generate as many alternatives as possible to resolve the problem situation, while deferring judgment about the quality of each alternative. The guiding axioms in brainstorming are that quantity breeds quality and that judgment must be suspended about the feasibility of any alternative. In a description of his personal problem-solving model, Carkhuff (1973) argued that a much-needed addition to the step of generating alternatives is the construction of a values hierarchy that will eventually assist in the selection of the appropriate alternative. A values hierarchy is a ranked listing of the things in life that the person values which are touched by or involved in the problem. Thus the values hierarchy is the element that highlights the uniqueness of each person's problem-solving program.

The fourth step in solving personal problems is decision making, the process of selecting one action from a number of alternative courses of action (Goldfried & Goldfried, 1975). The person evaluates the "goodness" of any particular action from the list of alternatives by determining the likelihood that the action will resolve the issues delineated in the problem-definition and formulation phase. Carkhuff (1973) observed that the person, in choosing any course of action, must determine whether such action helps or hinders a particular personal value identified in the values hierarchy. Courses of action that are congruent with an individual's value system are viewed as optimal.

Verification and evaluation is the final step in the personal problem-solving process (Goldfried & Goldfried, 1975; Heppner, 1978). This step involves testing out the plan of action and checking the outcome of the response against some standard. If the actions are congruent with the given standard, the individual is finished with the

I

f

a

(

p

e

p

to

ab

so

co

fo

ac

problem-solving process. However, if the actions are incongruent with the standard, the person continues to perform the appropriate problem-solving behaviors until a congruent action is selected. Two skills are involved in this stage: identifying the consequences of actions and comparing these consequences to a standard.

Cognitive Processes in Problem Solving

Specific cognitive problem-solving processes that mediate social adjustment have been the focus of research by Spivak, Platt, and Shure (1975). Thee authors argued that an understanding of cognitive processes is crucial to devising educational tools for developing healthy psychological adjustment. They proposed a group of cognitive skills that are necessary for social adjustment, while emphasizing that social adjustment is not a single ability.

Five problem-solving skills were highlighted by Spivak et al. (1975). The first skill is an awareness of the variety of possible problems that beset human interactions and a sensitivity to the existence of an interpersonal problem or at least to the potential of problems when two people get together. A second skill is the capacity to generate alternative solutions to problems. The third skill is the ability to articulate the step-by-step means necessary to carry out the solution. This skill is the recognition that obstacles must be overcome and that the reactions of others must be taken into account. The fourth skill involves consideration of the consequences of one's actions in terms of their impact on others and on oneself. The understanding that how one feels and acts may be influenced by how others feel and act is the fifth skill necessary for healthy social adjustment. These skills are not personality traits but are behaviors learned through experience with parents and may emerge at different ages.

Coping Skills Training

The psychotherapeutic approach most closely identified with the explicit teaching of coping skills is that of cognitive behavior therapy (Beck, 1976; D'Zurilla & Goldfried, 1971; Goldfried, 1980; Goldfried & Goldfried, 1975; Mahoney, 1974; Meichenbaum, 1977; Roskies & Lazarus, 1980). The cognitive behavior therapists have been instrumental in viewing the intervention process as training the client in the use of more general coping skills instead of resolution of specific problems. As with psychoeducational interventions, this orientation carries with it the clear implication that the therapist is a teacher, supervisor, and consultant who works with clients in a collaborative effort to teach them how to function effectively.

A coping skill (Goldfried, 1980) may be defined as any class of cognitive or overt behavior patterns that deal effectively with problem situations. The aim of coping skills training is to teach new skills that will broaden the response repertoire of the client and to increase the person's competence in mastering stress and tolerating distress. Therefore, generalization and maintenance of change are primary to coping skills training.

Coping skills training can be conceptualized along a continuum from teaching a single skill to teaching a comprehensive set of skills. Coyne and Holroyd (1982) believed that a coping skills package is preferable to treatments that teach a single coping skill for two reasons. First, because the complex demands of everyday life often require flexible coping skills, many stressful transactions cannot be managed by simple procedures. Second, since stress responses are caused by the person's transactions with the environment, people will continue to think and behave in ways that generate the very arousal they are trying to manage. Most comprehensive coping skills packages (Beck, 1976; Goldfried, 1980; Meichenbaum, 1977), in addition to providing graduated practice in the use of both cognitive and behavioral coping skills, teach clients to develop cognitive strategies or plans to facilitate the adaptation to the potentially threatening event.

Within a coping skills framework, the view of training clients as "personal scientists" who are skillful in the functional analysis and systematic improvement of their own behavior has been promoted by Mahoney (1974). Essentially, Mahoney argued that clients need to be taught broadly based survival skills through multicomponent treatment packages. He developed a paradigm which is similar to the components that comprise problem-solving models. This paradigm includes (a) orientation, (b) problem definition, (c) problem analysis, (d) solution generation, (e) personal experimentation, (f) evaluation, and (g) graduation. According to the model, therapy is an apprenticeship in problem solving.

Several treatment components are common to most coping skills programs (Roskies & Lazarus, 1980). A first and fundamental element is teaching the client the role of cognitions in producing the problem. Training in the self-monitoring of maladaptive self-statements and behaviors is the second feature of most coping skills programs. Third, as mentioned above, clients are trained in the fundamentals of problem solving. A fourth component from social learning theory is the modeling and rehearsal of effective self-statements and positive self-evaluation. Training in specific coping skills, such as relaxation and assertiveness, is often provided. The final component of coping skills programs is the *in vivo* behavioral assignments that become increasingly demanding over time.

The bridge that links coping theory with the clinical application of coping skills was delineated by Roskies and Lazarus (1980). Both areas share a common concern with process or dynamics as opposed to structure or traits and an emphasis on the intra-individual as opposed to the inter-individual. The authors additionally pointed out that both areas emphasize coping management rather than placing emphasis on features of the stressful situation itself.

Several clinical issues emerging from coping skills training were highlighted by Goldfried (1980). Client expectations of the program must be confronted immediately by emphasizing that the person is learning a skill and personal change will therefore be gradual. Thus, reducing anxiety during the early stages of skill training is viewed as secondary. In addition, the client needs to monitor his/her own success at coping with various situations following skills training and then compare that to previous attempts at coping in order to evaluate the personal effectiveness of the skills training. Finally, Goldfried warned that having a coping skill in one's repertoire does not insure that the skill will be used. The client must be trained to use affective cues to trigger the use of the skill.

According to the coping skills model, individuals are not only capable of dealing effectively with problem situations but are also aware of their abilities to do so. This concept has been referred to as perceived control (Brehm, 1966). People tend to resist the influence of others if they believe that such influence undermines their perceived freedom of choice. When people expect that they can successfully cope with a given event, the event will no longer be perceived as stressful.

Perhaps the best-known application of coping skills training to the management of stress is stress inoculation training (Meichenbaum, 1977). Stress inoculation training involves three phases: an educational phase, a rehearsal phase, and an application phase. The educational phase is designed to provide clients with a conceptual framework for understanding the nature of their response to stressful events. The most important aspect of this phase is that the conceptual framework should lead naturally to the practice of specific cognitive and behavioral methods. Within the conceptual framework, the client rehearses coping skills involving both direct action and cognitive techniques. Once the client becomes proficient in using these skills,

the the
under a
trainin

Se
197; Ri
strateg
definec
agent f
behavio
(Golcfr
riate w
are no
environ

Ka
procedu
equal p
person.
respons
Third,
is not
persons
an inte

Th
mediati

the therapist suggests that he/she test out and practice coping skills under actual stress conditions. Application of the stress inoculation training paradigm to pain management has been reported by Turk (1977).

Self-Control

Self-control approaches (Kanfer, 1975, 1977; Mahoney & Thoresen, 197; Rimm & Masters, 1979) aim at providing clients with active coping strategies for dealing with problem situations. Self-control is defined as "a process through which an individual becomes the principal agent in guiding, directing, and regulating those features of his own behavior that might eventually lead to desired positive consequences" (Goldfried & Merbaum, 1973, p. 11). A self-control program is appropriate when a person is behaving in a self-defeating manner and there are no immediate and potent reinforcers of alternative behaviors in the environment.

Kanfer (1977) outlined the requirements of a self-control procedure. First, the behavior in question is one that has relatively equal positive and aversive consequences, posing a conflict for the person. Second, before the occurrence of the behavior, a controlling response is introduced that reduces the probability of the occurrence. Third, the controlling response is initiated by self-generated cues and is not under direct control of the physical environment. Therefore, persons generate new behavioral sequences for themselves, emphasizing an internal locus of control.

The mechanisms of self-control can be explained within a cognitive mediational model (Kanfer, 1977). According to this model, self-control involves behavioral shifts in which external influences, termed alpha variables, are supplemented by self-generated cues and reinforcers, called beta variables. Two outcomes are possible: (a) the probability of a response with initial high likelihood of occurrence is decreased, or (b) the probability of a response with initial low likelihood is increased through the use of self-generated behaviors. The common element in all self-control situations is a change in what was initially a very stable or a very gratifying, but nevertheless self-defeating, state of affairs.

Kanfer (1977) developed a three-stage model for self-control. This model involves self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring involves careful observation and recording of the target behavior, the stimulus environment in which the behavior is carried out, and the antecedents and consequences of the behavior. Self-monitoring therefore involves stimulus control. During the stage of self-evaluation, clients compare their response with some subjective standard derived from previous direct or vicarious experience. After the individuals evaluate their response according to the standard, the stage of self-reinforcement is initiated. In the case of a behavioral deficit, instances of the target behavior are rewarded. In the case of a behavioral excess, responses that effectively compete with behavioral excess are rewarded.

Following this brief review of the related areas of coping skills training and self-control, a discussion of the psychology of pain, psychological interventions for pain management, and selected research of follow-up studies of pain interventions is presented.

Psychology of Chronic Pain

Chronic pain is clearly a multifaceted phenomenon. Those who suffer with chronic pain can provide eloquent testimony that it is far more than simply a sensation, but is a highly personal experience for which words alone are frequently awkward and inadequate symbols. Without successful management, chronic pain invades every waking and sleeping moment and influences every activity. Unique among sensations, pain is a commanding and demanding perception that dictates quality of life and lifestyle choices.

Several writers have observed that the experience of pain is a function of many different factors (Melzack, 1973; Melzack & Wall, 1982; Steger & Fordyce, 1982; Sternbach, 1974). Pain may be a function of anxiety or fear level, past conditioning experiences, cognitive expectations, pain history, perceived consequences of pain, various personality and psychological factors, and tissue damage. Pain has not only sensory qualities but also has emotional and motivational qualities which may be subject to modification. There is widespread agreement with Melzack and Wall's (1982) observation that "a knowledge of pain perception goes beyond the problem of injury and the sensory signals of pain" (p. 27).

The nature and range of the sensations covered by the word "pain" elude precise definition (Melzack, 1973; Melzack & Wall, 1982; Sternbach, 1974). An often-cited definition is that pain is an "abstraction" used to refer to a great variety of different feelings which have little in common except for the quality of physical hurt (Sternbach, 1974). These unpleasant sensations vary greatly in quality, intensity, location, and time course. Therefore, pain is ultimately defined by the experiencer, based on a variety of specific stimuli, experiences, and responses.

Chronic pain is considered to be pain that persists constantly or intermittently for several months or more, long after it can serve a useful function (Melzack & Wall, 1982; Sternbach, 1974). The pain becomes intractable and the patient is unable to give meaning to it. It therefore makes no sense as a warning signal since it cannot be avoided or treated. The person is unable to take appropriate pain-relieving action as in the case of acute pain. In many cases, unable to find a purpose for the pain, chronic pain patients wonder how they can deserve the pain and end up feeling punished by it. LeShan (1964) wrote that the world of the chronic pain patient is a "nightmare" that fosters feelings of meaninglessness, helplessness, and hopelessness. The pain patient's perception of the world, relationship to others, preoccupations, and activities all seem to alter rather markedly during the experience of chronic pain.

Perhaps Melzack (1973, 1982) has done more than any other researcher to delineate the various qualities of the chronic pain experience and to highlight the psychological components of pain. Arguing that current definitions of pain that rely solely on tissue damage or sensory qualities are inadequate, Melzack stated that the word "pain" represents a category of experiences signifying a multitude of different unique experiences having different causes and characterized by different qualities varying along a number of sensory and affective dimensions.

For many years the specificity theory of pain played a prominent role in shaping thought regarding the experience of chronic pain, a theory that described pain as a simple sensation serviced by a direct transmission line to a pain center. As a more complete understanding of pain emerged, Melzack and Wall (1965) formulated the "Gate Control Theory" of pain. This theory proposes that a neural mechanism in the dorsal horns of the spinal cord acts like a gate which can increase or decrease the flow of nerve impulses from peripheral fibers to the central nervous system. Somatic input is therefore subjected to the modulating influence of the gate before it evokes pain perception and response. The degree to which the gate increases or decreases sensory transmission is determined by the relative activity in large-diameter (A-beta) and small-diameter (A-delta and C) fibers. When the amount of information that passes through the gate exceeds a critical level, it activates the neural areas responsible for pain experience and response.

The Gate Control Theory suggests that past experience, attention, and emotion may all influence pain perception and response by acting on the spinal gate mechanism. Some of these psychological mechanisms may open the gate while others may close it. Therefore, personal psychological needs and coping styles are important in determining the person's response to the presence of pain. Coping styles, sense of self-control, and problem-solving skills all have considerable relevance for patients in chronic pain. Patients who are taught a process of personal health care decision making via a psychoeducational model can be expected to demonstrate altered responses to their chronic pain.

Psychological Interventions for Chronic Pain

Traditional medical interventions have been largely ineffective in relieving the chronic pain sufferer (Loeser, 1974; Steger & Fordyce, 1972; Sternbach et al., 1973). In fact, Loeser (1974) observed that success rates for certain chronic pain problems, such as low back pain, rarely exceed 60%, and long-term success rates are below 30%. Given these disappointing results, Sternbach and his colleagues (1973) coined the expression "low back loser" to describe patients who complain of pain for 6 months or longer, have an inability to work and are supported by social security or disability, and are in continual search for medical and surgical relief despite previous surgery. The recognition of psychological factors in chronic pain has prompted researchers to study the effectiveness of psychological interventions in the management of chronic pain. This section is divided into two parts: a brief review of the general effectiveness of the various psychological interventions and a summary of follow-up studies of multicomponent programs for chronic pain patients.

Due to the complexity of a pain problem for any given individual, psychological treatment strategies are combined into a comprehensive multicomponent approach. The treatment modalities used in pain clinics generally fall into three types: operant conditioning techniques, cognitive behavioral techniques, and psychophysiological techniques. A brief description of each of these methods along with related outcome research is now presented.

Operant Treatment of Chronic Pain

A great deal of the published work in the area of pain management has been reported by Fordyce and his associates (Fordyce, 1976; Fordyce et al., 1973) using an operant conditioning model. The goal of the operant approach is to decrease operant, or learned, pain behaviors and to replace them with behaviors inconsistent with the sick role, i.e., "well behaviors." This goal is accomplished by making changes in the environmental contingencies, the rewards and punishments following specific behaviors, so that desired behaviors are rewarded and pain behaviors are not. Therefore, direct modification of pain is not a goal of the operant approach.

There are four basic premises to the operant approach to pain management (Fordyce, 1976). First, pain behavior, those behaviors indicative of pain and suffering, may become chronic for reasons other than the original cause. Pain behavior may have little or no link to physical "hurt" arising from the site of the damage which initiated the pain problem. Second, it is unnecessary to use intrapsychic variables such as "personality" or "motivation" to conceptualize the pain problem. From the operant viewpoint, pain behavior can be understood entirely in learning theory terms. A third premise is that treatment strategies can be based on counterconditioning principles. Finally, multiple behavioral methods exist for teaching patients to alter their pain behavior.

The prototypical operant program was reported by Fordyce and his associates (1973). In their program, the staff of an inpatient clinic ignored patients' pain behaviors and praised actions inconsistent with the sick role. Results showed that patients had significant increases in physical therapy activities and decreases in medication intake from admission to discharge. However, patients reported considerable pain on questionnaires completed an average of 22 months after termination of outpatient treatment. Patients retrospectively rated themselves as having had significant decreases in pain and increases in activity levels between admission and discharge, but no change following discharge.

A review article of inpatient operant treatment studies by Turner and Chapman (1982b) yielded several conclusions regarding the effectiveness of operant interventions. Lengthy inpatient operant programs appeared to increase physical activity levels and decrease medication use while the patient was in the controlled hospital environment. There is evidence from a few studies that these improvements were maintained by most patients at follow-ups of from 1 to 8 years. However, patients were carefully selected for participation in operant programs, and only a small percentage of the chronic pain population was ever admitted to an inpatient operant program. There is very little information concerning whether operant programs reduce subjectively experienced pain since this is usually not a primary goal. Finally, operant programs often consist of a plethora of independent variables potentially affecting outcome, and because these are uncontrolled studies, it is difficult to assess the unique contributions of contingency management techniques to reducing chronic pain behaviors.

Cognitive-Behavioral Interventions for Chronic Pain

A recent development in the field of pain management has been the application of cognitive-behavioral theory and techniques to the prevention and alleviation of pain (Goldfried, 1977; Meichenbaum & Turk, 1976; Tan, 1982). An assumption of this approach is that the beliefs, expectations, and attitudes people maintain in particular situations can determine their emotional and behavioral reactions to those situations. Since cognitive variables, such as distraction and the meaning of the pain for the individual, and emotional variables, such as anxiety, influence the experience of pain, it is logical that the modification of cognitions could be used to alter the pain experience. Unlike the operant approach, the cognitive-behavioral model does not ignore the subjective experience of pain. Rather, it views suffering as one of several aspects of a complex pain problem.

Cognitive-behavioral therapy aims to correct faulty cognitions underlying emotional and behavioral disturbance. When applied to pain problems, these interventions consist of such pain-control strategies as relabeling sensations, relaxation, and imagery. These interventions attempt to increase the patient's awareness of events that exacerbate and actions that reduce pain, so that the patient may more effectively avoid or cope adaptively with pain-increasing events and use pain-relieving actions. The argument is that this awareness and knowledge can give the chronic pain patient a sense of control over pain that replaces feelings of anxiety and helplessness.

Cognitive-behavioral interventions have demonstrated potential to alleviate reported pain in a variety of pain syndromes (Turner & Chapman, 1982b). In the only direct comparison study of cognitive-behavioral therapy with another psychological intervention, this treatment was found to be more effective than electromyographic (EMG) biofeedback (Holroyd, Andrasik, & Westbrook, 1977), but a combination of cognitive-behavioral therapy and EMG biofeedback has not been found in other studies to be more effective than cognitive-behavioral therapy alone (Reeves, 1976). Most studies have not included objective behavioral measures (such as observer ratings of pain behaviors, records of medication use, health care utilization, employment, and activity level) or adequate follow-up. In addition, outcome measures in these studies have usually been too narrowly focused (Turner & Chapman, 1982b). Tan (1982) suggested that while cognitive-behavioral methods for pain attenuation appear promising, the scientific evidence from controlled studies for their efficacy with clinical pain is still somewhat meager.

Physiological Interventions for Chronic Pain

Two types of psychological interventions that emphasize the control of physiological factors in the development of pain are muscle-relaxation training and biofeedback. The purpose of relaxation training is to relax tense muscles believed to cause musculoskeletal pain and other related disorders, such as tension headaches. Although many variations of muscle-relaxation training are currently practiced, most involve progressively tensing and then relaxing major muscle groups throughout the body. Most research using relaxation training has been studies of tension of migraine-headache sufferers, and few investigators have evaluated relaxation training with other chronic pain syndromes (Turner & Chapman, 1982a). Of the ten studies reviewed by Turner and Chapman, eight showed decreases in the frequency, intensity, and duration of self-reported headaches.

Biofeedback procedures have been used in chronic pain clinics in conjunction with other treatment modalities, but application of biofeedback procedures alone to relieve chronic pain is a very limited area of research. In biofeedback training, patients become aware of particular involuntary processes through feedback of electronically monitored physiological events and learn to bring these under control. Four types of feedback are used with chronic pain syndromes: electroencephalographic (EEG) feedback, skin-temperature feedback, cephalic-blood-volume feedback, and electromyographic feedback. Research has dealt with the application of biofeedback to headaches. Turner and Chapman (1982a) concluded that the various types of biofeedback, usually with home relaxation practice, have been demonstrated to reduce tension and migraine-headache activity. However, biofeedback appears to be no more effective than muscle-relaxation training, a simpler and far less costly alternative because it requires minimal equipment and can be taught in groups. The success of biofeedback with other chronic pain populations has not been convincingly demonstrated.

Follow-Up Studies of Multicomponent Pain Clinics

Multicomponent pain clinics are emerging as the preferred mode of treating the chronic pain patient. A variety of modalities are found in these clinics, including physical therapy, relaxation training, biofeedback, psychotherapy, educational classes, and family meetings. Several shortcomings of studies of the effectiveness of multicomponent pain clinics have been discussed (Aronoff, Evans, & Enders, 1983). The first problem identified was the use of outcome measures with questionable validity and reliability. The concept of "improvement in functioning" requires an analysis of multiple factors and for many of these factors, at present, few tests exist that have been standardized with proven reliability, validity, and developed norms. Aronoff et al. (1973) recommended the use of the McGill Pain Questionnaire (Melzack, 1975) since it fulfills these requirements. Comparisons between pre- and post-treatment are difficult to make because of the failure of researchers to use accepted standardized instruments and to use the same instruments at each observation point. A second shortcoming of follow-up studies is the problem of finding an appropriate comparison group. Other criticisms include the variable lengths of time for follow-ups, dependence on subjects' memory of events rather than actual measurement at the time, and appropriately large sample sizes.

A study that sought to answer the question of why patients who do well during a clinic program deteriorate shortly following discharge and regress to pre-treatment levels within a few months was done by Painter, Seres, and Newman (1980). The authors mailed 500 extensive questionnaires to patients who completed a multicomponent pain program and asked them to recall information that had been true for them 2 years previously. Of the 145 questionnaires returned, results showed that 77% of the patients felt improved as a result of their pain center experience, with an average pain reduction of 38%. Further improvement following discharge was noted by 27% of the sample, with an average additional reduction in pain of 21%. Deterioration was reported by 27% of the sample. At the time of admission, 70% had been receiving compensation, whereas only 45% were receiving compensation on follow-up. On admission, approximately 90% were unemployed, compared to 48% at follow-up. A total of 61% of the patients reported that they had no further medical care for their pain after discharge, while 17% stated that they were seeking other medical solutions. Additionally, 20% reported having returned to the use of narcotic medications which had been eliminated by the pain program. An interesting feature of this study is the attempt to determine which factors were likely to influence long-term outcome. The authors found that the failure group demonstrated fewer incentives for maintaining their gains, with most continuing to receive financial compensation for their pain. Also, the failure group was more likely to assume a passive, dependent stance, with depression as a primary mode. Finally, those in the failure group had done little to change their environment and continued to find reinforcement for pain behavior.

In an attempt to avoid the problems inherent in self-report questionnaires, Anderson, Cole, Gullickson, Hudgens, and Roberts (1977) obtained their information in face-to-face interviews with 31 patients who completed an outpatient pain program of a hospital. Follow-up time varied from 6 months to 7 years. The authors reported that 25 patients were leading "normal lives" and five patients were not. Although the advantage of this study is that the evaluations were conducted face-to-face, the methods by which it was determined that the patients were leading a "normal life" were not made clear. Also, it was unclear whether pre-treatment measures were obtained and how these were compared to post-treatment measures.

A multicomponent pain clinic study using group therapy, discussion, behavioral methods, biofeedback, and relaxation was conducted by Swanson and his associates (1976) using data from 200 patients. At discharge, patients were rated by staff in three categories: (a) modification of attitude, (b) reduction in medication, and (c) improvement in physical functioning. Patients were subjectively rated in each category as having made no progress, minimal progress, moderate progress, or marked improvement. Pre-treatment measures were patients' self-reports, while 3-month follow-up measures were mailed questionnaires. Results indicated that 75% of the patients had improved moderately or markedly at the 3-month follow-up. A shortcoming of this study was the inconsistency in the measures used at different times, thus making comparisons very difficult.

Employing a paradigm first devised by Fordyce and his associates (1973), Roberts and Reinhardt (1980) evaluated outcomes of patients treated in a "pure" behaviorally oriented program using two comparison groups. A group of 26 treated patients was compared with 20 patients rejected for treatment by the clinic and 12 patients who had refused treatment. The follow-up in this case ranged from 1 to 8 years. In general, a "successful" treatment outcome was a person who was employed or normally active for at least 8 hours a day, receiving no compensation, no hospitalization since treatment, and no use of prescription pain medication. Of the 26 treated participants, 77% met all these criteria. Instrumentation employed was the Minnesota Multiphasic Personality Inventory (MMPI), the McGill Pain Questionnaire, and a daily activity inventory. Treated subjects had significant decreases on the Hypochondriasis (Hs) scale of the MMPI, in the number of hours in pain per day, in the use of medications at follow-up, and were more often in paid employment than subjects in the comparison groups. Treated subjects also reported fewer pain-related hospitalizations than those in the other groups and more often reported improved ability to engage in sexual activity. In contrast to subjects in the comparison groups, treated subjects had significantly lower scores on the Hypochondriasis (Hs), Depression (D), and Hysteria (Hy) scales of the MMPI.

In another study using comparison groups, 100 patients who completed a comprehensive outpatient pain rehabilitation program were divided into three groups: (a) pending disability, (b) current disability, and (c) no disability (Chapman, Brena, & Bradford, 1981). Follow-up intervals ranged from 15 to 30 months, with a mean of 21 months. Forty-eight patients returned questionnaires, and an additional 40 patients were reached by phone and provided some information. The questionnaire included a daily activity sheet, a medication record, a 5-point visual analogue pain intensity rating, and two measures from the McGill Pain Questionnaire. Results indicated that there were significant overall decreases in reported pain intensity from pre- to post-treatment and from pre-treatment to follow-up. The number of reported daily activities increased significantly across groups from pre-treatment to post-treatment and from pre-treatment to follow-up. The results of the McGill Pain Questionnaire were not reported clearly, so it is impossible to determine whether they were significant. Patients reported decreases in the use of pain medications across all groups, but again it is unclear whether the differences were statistically significant. Disability status was not significantly related to any outcome.

Along with the multidisciplinary treatments received by patients in a pain clinic program, the therapeutic regimen that patients are expected to continue on their own following discharge is multifaceted and requires basic behavioral and lifestyle changes. A study that assessed long-term adherence to therapeutic regimens was conducted by

Lutz, Silbert, & Olshan (1983). Of 77 former patients from a multicomponent clinic, 74% (n = 57) responded to mailed questionnaires. The average length of follow-up time was 23 months. The questionnaire was designed to assess treatment outcome along three dimensions: subjective pain, activity and lifestyle, and medication use. Compliance rates were assessed for each of five separate home regimens, including ambulation exercises, physical therapy and occupational therapy exercises, home treatments, relaxation and self-hypnosis exercises, and use of proper body mechanics. Excluding the home treatments, compliance on a daily basis with the therapy regimens varied from 32% to 52%, with an average compliance rate of 42%. Overall compliance was extremely low, with only 12% of respondents complying with the total combination of prescribed regimens. The authors concluded that overall compliance is not a useful measure because it does not explain long-term treatment outcome as well as a separate assessment of individual regimens.

A novel, multielement approach with a strong educational component was investigated by Goldsmith (1981). The aim of this study was to break the tension-anxiety-pain cycle by using various stress-reduction and self-control strategies. Twenty chronic low back pain patients were randomly assigned to one of two treatment groups. One group received training in self-control techniques, assertiveness skills, cognitive and behavioral depression management, and relaxation techniques, while the second group received training in bodily repositioning. Pre-treatment, post-treatment, and 1-month follow-up data were obtained on the McGill Pain Questionnaire and the Beck

Depression Inventory. Results indicated that in both groups there were significant reductions on global pain ratings and in pain medication use. Subjects reporting the most global self-monitored pain decrease following educational treatments had the highest McGill affective pain ratings. After treatment, affective pain ratings were lower and pain intensity diminished. In contrast, those reporting the least global pain reduction following the educational treatment had the highest McGill evaluative pain scores. The conclusion was that the tension-anxiety-pain hypothesis may be most valid with a subgroup of patients who are depressed, with a large pain component which is affected by emotional arousal.

Summary

Psychoeducation or psychological skills training has emerged as an important area in the delivery of mental health services during the past 15 years. The term "psychoeducation" refers to the teaching of personal and interpersonal attitudes, skills, and concepts which the person can apply both in the present and in the future to increase their own and others' satisfaction with life. Two trends have encouraged the development of psychoeducation: the public's growing interest in psychological knowledge and recognition by psychologists that psychological knowledge can be shared.

Following the tenets of the educational model in psychology, psychoeducation purports several assumptions: (a) the psychologist assumes the role of teacher and the client the role of student, (b) client problems are viewed as skill deficits rather than "illnesses" or symptoms; and (c) clients are active rather than passive participants in the learning process. Each of these assumptions is essentially antithetical to those made in the medical model of service delivery.

This review addressed the features of four related areas: general instructional programs, problem-solving programs, coping skills training, and self-control. All of these areas share the aim of broadening the person's repertoire of personal and interpersonal skills in order to facilitate adaptation and performance in a variety of situations.

General behavior change programs tend to follow a similar format of stages: (a) specify a behavior requiring change, (b) set goals and develop a self-change contract, (c) self-monitor the target behaviors' frequency of occurrence, and (d) rearrange antecedents and consequences. These programs employ an operant approach to change, instructing the person to manipulate the antecedents and consequences of a target behavior. Emphasis is placed on the process of moving through the stages, as opposed to generating one solution to a problem. Other programs emphasize social-learning principles in behavior change, including modeling, role playing, and performance feedback.

Closely related to general behavior change programs are the problem-solving programs. With some minor variations, these programs typically instruct the person to engage in a process of (a) general orientation, i.e., problems are a part of life and are solvable; (b) problem definition and formulation; (c) generation of alternatives, (d) decision making, and (e) verification and evaluation. Programs that depart from this format may highlight one variable thought to be central to the process of solving problems, such as fear. Effective problem solving has been found to be a feature of good psychological adjustment.

Another area of literature that advances the concept of expanding an individual's repertoire of personal and interpersonal skills is coping skills training. The psychotherapeutic approach most closely identified with the explicit teaching of coping skills is cognitive behavior therapy. A coping skill is any type of cognitive or overt behavior pattern that effectively deals with a problem situation. Several components are common to coping skills treatments: (a) highlighting the central role of cognitions in producing a problem, (b) training in self-monitoring of self-statements, (c) training in the fundamentals of problem solving, (d) modeling and rehearsal of effective self-statements, and (e) *in vivo* behavioral assignments.

Individuals provided with coping skills training are encouraged to view change as a slow, gradual process that initially has little anxiety-reducing effects. In addition, acquisition of a skill is not sufficient to insure that a person will use the skill, and an awareness of affective cues that trigger the use of the skill is essential.

Self-control refers to the process through which a person becomes the principal agent in guiding and directing those features of his/her own behavior that may lead to desired positive consequences. The domain of self-control covers self-directed behavior sequences in which a person is exposed to a conflict and to a demand to take actions that initially alter the likelihood of executing a previously probable response. Individuals are instructed to regulate their own behavior through a three-step process of self-monitoring, self-evaluation, and self-reinforcement.

Chronic pain is a multifaceted phenomenon influenced by a constellation of psychological and personality factors. The specificity theory, viewing pain as strictly a physical sensation, has been replaced by the Gate Control Theory, which regards pain as a complex phenomenon with emotional and motivational components subject to modification. Most theorists regard pain as an "abstraction" used to refer to a variety of feelings which have little in common except for the quality of physical hurt. For the sufferer, chronic pain is intractable, having no meaning and serving no purpose.

In response to the growing acceptance of the Gate Control Theory of Pain, a number of psychological interventions are currently used in conjunction with more traditional medical intervention. These include (a) physiological interventions: biofeedback and muscle-relaxation training, (b) cognitive behavioral therapy, and (c) operant conditioning interventions. Each of these interventions addresses a different aspect of the experience of the chronic pain patient.

The operant approach seeks to decrease learned pain behaviors and to replace them with behaviors inconsistent with the sick role. Operant interventions have been shown to increase physical activity levels and decrease medication use during treatment, with some support

c
p
h
B
be
ac

ne
wi
par
tiv
pai
the
natu

for maintenance of these gains. However, it has been difficult to assess the unique contribution of contingency management techniques.

Cognitive-behavioral interventions attempt to alter faulty cognitions underlying the pain experience. While these interventions show much promise in alleviating reported pain, the scientific evidence of their efficacy remains meager.

Research with muscle-relaxation training and biofeedback, which focuses on the control of physiological factors in the development of chronic pain, has been narrowly confined to one pain syndrome, headache pain. Muscle relaxation appears effective in decreasing self-reported headaches, although these studies have been hampered by poor controls. Biofeedback, typically an adjunct to other treatments, has been found to be no more effective than muscle-relaxation training in reducing headache activity.

Follow-up studies investigating the effectiveness of multicomponent pain clinics have several weaknesses: use of outcome measures with questionable validity and reliability, use of inappropriate comparison groups, variable lengths of follow-up, dependence on retrospective measurements, and small sample sizes. In general, although 60% of pain patients demonstrate significant gains during their treatment, there is a notable regression in improvement once they return to their natural environment and only 30% maintain their gains.

The methodology for the study is presented in Chapter Three.

CHAPTER 3

METHODOLOGY

In this chapter the methodology of the study is described. Included in the chapter are a description of the Personal Paradigm Shift (PPS), the sample used, the instrumentation, the procedure, a statement of research hypotheses, and an explanation of the statistical procedures used for data analysis.

Description of Personal Paradigm Shift

The PPS employs a psychoeducational approach to personal behavior change and health care management. This program was developed by Hinds (1983) over a period of several years of practicing psychotherapy and teaching students in graduate-level courses. The instrument evolved from his observations of the dynamics of how people learn the process of personal change and make decisions about managing stress. The reading level of the PPS was estimated to be at the sixth-grade level using Fry's (1968) readability technique.

The procedure used in this program closely follows three assumptions associated with psychoeducational intervention models (Larson, 1984):

w

p

t

as

he

at

an

the

rea

rat

shi

nal

is

proc

cruc

acqu

imple

.

1. The psychologist becomes a teacher to the client.

2. Health care behaviors are viewed as functional relationships which can be unlearned or changed.

3. Clients are viewed as active participants in the treatment process and are given responsibility for various choice points in the treatment process.

The PPS provides an organized approach to self-care which can assist patients in achieving their health care goals. Unlike many health care interventions that ask for patient compliance, this program attempts to achieve internalization as a means of altering behaviors and maintaining change. Suedfeld (1982) described internalization as the change in attitudes and associated behaviors that results from the realization that a change to a new pattern will be beneficial, rational, and worthy of acceptance. Internalization may involve a shift in the value system to accommodate this new outlook. When internalization occurs in the context of health attitudes and behaviors, it is called maintenance. In the PPS, treatment is seen as an educational process that engages patients in helping themselves.

The PPS meets four of the six conditions that are thought to be crucial to lifestyle intervention (Benfari, Eaken, & Stole, 1981):

1. The patient knows what change is desirable and why and acquires the knowledge required for the change.

2. The patient has the skill or is learning the skill to implement the knowledge for change.

3. The change is in the patient's self-interest.

(fa

cha

char

six
pla
envi
the
and
main
obse
proc
in l

invo
pers
teach
chang
manag

behav
proce

4. The change is in the self-interest of related primary groups (families, peers, etc.).

5. Both internal and external environmental systems require change.

6. Internal and external change agents give their support to the change and provide feedback through the process.

The fourth condition is not directly addressed in the PPS, and the sixth condition is considered only in part because more emphasis is placed on the recognition and development of personal control than on environmental contingency controls. The PPS is organized to assist the patient in identifying significant psychological, environmental, and psychosocial lifestyle variables that affect health and pain. The main feature of this program is that it involves the individual in observing, experiencing, and determining his/her own behavioral-choice process. Treatment is an educational process that engages the person in learning how to make personal change.

While many intervention programs in health care management involve the patient as a passive change agent, the PPS involves the person as an active agent in the change process. The PPS strives to teach the patient about learning as it is related to personal behavior change and choice. Patients can learn about the decisions they make in managing their health which affect the quality of their lives.

Like other personal problem-solving programs, the PPS assumes that behavior change proceeds through a sequence of stages. The change process involves the experience of (a) personal health care awareness, (b

pl

ed

(e.

pe

be

ot

Sta

per

car

ing

suc

the

exa

var

pers

with

"pa

prob

set

objec

(b) decision making, (c) oppositional alternatives, and (d) treatment planning and action. Each stage comprises detailed steps designed to educate individuals about the relationships between internal phenomena (e.g., feelings, thoughts, physiological reactions) which maintain personal problems and distress. This detail within each stage of the behavior change process is one factor that sets the PPS apart from other problem-solving models.

Stage 1: Awareness

The stage of awareness comprises seven steps which guide the person through a series of exercises designed to assess current health care behaviors and to confront personal dynamics with the aim of creating self-understanding. Patients are often unfamiliar with observing such a process, and therefore this stage may be slow and difficult for them. The key to this stage is that patients are confronted with examining the critical relationships between internal and external variables which maintain personal problems.

In Step 1 of the awareness stage, patients are asked to identify a personal problem which they want to work on. The problem is described with a label or "theme," such as "workaholic," "self-sacrificer," or "pain gets the best of me." Accurate identification of a workable problem is essential to completion of the remainder of the program.

Once the patient has identified a theme, some initial goals are set relating to that theme (Step 2). These goals are behavioral objectives that assist the person in looking to the future with

op
th

fo
ev
ti
th
an

(t
oc
un
th

se
st
the
pr

in
ext
con
bas
acq

optimism. The person in pain may state an initial goal as "do more things with my family."

Step 3 involves identifying antecedent events to a problem, a step found in most behavior-change programs. A specific description of the events, situations, or people that elicit problematic internal reactions in the person is recorded. The person in chronic pain may list the following: "getting into an argument," "pushing myself too hard," and "having others ask me how I'm doing."

Antecedent events affect internal reactions, i.e., the beliefs (thoughts), feelings, mental images, and physiological reactions that occur within. These internal reactions are identified in Step 4. An understanding of the relationship between these internal reactions is the goal of this step.

Since any given behavior is an expression of the chain of sequential steps which precede it, Step 5 is an examination of the steps a person takes in the identified problem situation. Changing these steps is seen as a necessary but not sufficient condition in problem solving.

Step 6 addresses the consequences that follow a person's action(s) in the problem situation. Consequences may be either internal or external. A link is also established between self-evaluations and consequences; i.e., people make internal judgments about themselves based on the consequences of their behavior. Finally, the person acquires an awareness of the "needs" that are met by behaving in sel

imp

unic

The

leve

foun

not

usua

acqu

is ne

as tr

Stag

the c

influ

makin

commi

10).

manua

as an

infor

concre

the i

self-defeating ways, and emphasis is placed on identifying the level of importance which these needs have for the person.

The final step of awareness is termed "taking a loss," Step 7, a unique feature of the PPS not found in other behavior change manuals. The task facing the person is to identify either the beliefs or the level at which a need is maintained that must be "given up" before a foundation can be made for behavior change. Personal change involves not only gaining something but also giving up something, a feature not usually understood by people. The second part of this step is the acquisition of awareness of the assumptions the person makes about what is needed in life in order to survive, assumptions the person accepts as true and uses to guide behavior.

Stage 2: Decision Making

The stage of decision making requires patients to determine how the critical information they have gained from the awareness stage influences their decision making about personal change. This decision making consists of three steps: constructing a balance sheet, making a commitment to change, and confronting the fear barrier (Steps 8, 9, and 10). The process in this stage is not found in other behavior-change manuals.

Step 8 requires that the patient construct a balance sheet, just as an accountant would do, using thoughts and feelings as the critical information. This step provides an opportunity to visualize, in a concrete way, the specific conflicts that inhibit the ability to make the identified change and the factors that motivate the desire for

char
deny
to a
the
ing

refl
cogn
pledg
elect
of af

centr
the f
resis
Expec
pain a
defens

Stage

T
intern
mental
the Aw

change. Until patients confront these factors, it is easy to avoid or deny information that will provide the motivation to make a commitment to a personal change. Using a balance sheet format, patients generate the perceived punishments and rewards that they will accrue for changing or not changing.

The briefest step in the manual, Step 9, asks the person to reflect on the data gathered from the previous step and make a cognitive and emotional commitment to change. In a sense, the person pledges to continue efforts toward personal change. A person may not elect to make a commitment to change and decide that the present state of affairs is satisfactory.

The inhibiting influence of fear on behavior change is one of the central concepts of the PPS and is addressed in Step 10, approaching the fear barrier. In this step the person attempts to confront resistance to change by identifying the fears associated with change. Expectations about the experience of unpleasant emotions like shame or pain are addressed, and additionally, the person identifies the usual defenses used to avoid the experience of these emotions.

Stage 3: Oppositional Alternatives

This stage is a creative process that assists in generating new internal reactions, i.e., beliefs, feelings, physiological reactions, mental images, that are counter to the internal reactions identified in the Awareness stage. The four steps (11 through 14) comprising this

sta
wil

rea
the
ste
litt
has
inte
over

beli
the
to t
unhe
deve
pers
deve
satis
of ne
are

the p
usual
direc

stage help patients to develop a new set of internal reactions which will foster a sense of self-control.

The first building block in constructing a set of new internal reactions to replace the old internal reactions is to once again record the information from Step 3, stressful conditions of the problem. This step is repeated as Step 11 to emphasize that a person really has very little control over these factors. Hinds (1983) stated that a person has control over the connection between variables (stress conditions - internal reactions - behavior - consequences - self-evaluations), not over the events, people, or places that trigger stress.

Step 12, developing new internal reactions (new feelings, new beliefs, new images, new physiological reactions), is perhaps one of the most critical and difficult steps in the PPS. The task is to begin to think about new, healthy internal reactions that oppose the old, unhealthy, yet familiar, internal reactions. This step encourages the development of a "paradigm shift" (Hinds, 1983), or a change in the way persons view their experience. The chronic pain patient who is able to develop new internal reactions to pain has a better foundation for new satisfying behaviors. The second aspect of this step, the development of new self-evaluations, follows naturally once new internal reactions are in place.

Step 13, thinking about new actions, is a natural progression from the previous step. In other behavior-change manuals, this step is usually referred to as "developing alternatives," and the person is directed to brainstorm as many alternative behaviors as possible while reserving judgment as to the appropriateness of those behaviors. These behaviors must be counter to the old behaviors. Although a person may not fully believe that these new behaviors can be performed, the exercise may be useful in itself.

Developing new consequences following from new actions is the goal of Step 14. While new consequences may partly reflect projected or expected losses, new gains will outweigh those losses, and keeping the gains before oneself is the task in this step. New gains are frequently felt as internal experiences, i.e., more self-control, improved self-esteem, greater self-confidence. However, they may also be expressed in the external realm, i.e., improved social life, more contact with others. Identifying the needs now satisfied as a result of these new consequences is the second part of this step.

Stage 4: Treatment Planning and Action

The final phase of the PPS consists of ten steps (15 through 24) in which the patient begins to establish a firm foundation for personal change. One of the reasons people do not maintain treatment goals is that they leave out simple, yet crucial, supports for their new actions. "Treatment Planning and Action" assists the person in organizing those supports and using them effectively. These steps together help to reduce fear and increase motivation for change while preventing feelings of helplessness and hopelessness.

In Step 15, patients identify the initial goal they need to achieve in order to stay motivated to change. This initial goal must be realistic, specific, and countable. In this step, patients are taught how to formulate initial change goals into behavioral terms and are shown that goals which are within their resources will provide motivation to continue the change process. The statement of goals in specific, behavioral terms is a common feature of personal change programs.

Creating support systems to prevent feelings of helplessness during a personal change program is the objective of Step 16. The rationale for developing support systems is that people need to acknowledge their dependency on others in the course of living, and drawing on the assets of others may provide a source of strength.

Step 17, seeking new information and finding a model, urges people to identify others who have accomplished what they are attempting to do and find information sources that may assist them in reaching change goals. This step is based on concepts of observational learning and modeling.

In Step 18, the task is to provide oneself with a small reward immediately following the accomplishment of an initial change goal. Positive reinforcement immediately following appropriate behavior is a central principle of operant learning and encourages the development of self-control. The self-rewards must be personal and meaningful so that they continue to be a source of motivation.

A unique feature of the PPS is Step 19, developing an organized "plan of attack" in working on a personal problem. Patients are encouraged to determine the order of behaviors they will perform to ach

bec

wor

cha

fro

pro

pos

tha

In

to

it

abo

mai

the

a s

the

a p

Per

and

Phe

Per

achieve a satisfying solution to a problem. This sense of organization becomes a predictable pathway for the patient to remain motivated to work toward personal change and serves to demystify the process of change.

People who are attempting behavior change often ignore feedback from their efforts because it may show that they are making very little progress toward their goal, and therefore they avoid discouragement and possible failure. Feedback would then be regarded as an enemy rather than an ally that may serve a self-corrective function for the person. In Step 20, the person is taught the meaning of feedback and shown how to develop a feedback system. Feedback is most effectively used when it is specific and accurate in providing a person with information about progress toward a goal.

A further way to counteract failure to reach a change goal and maintain motivation to change is to set a time frame for accomplishing the goal, the task of Step 21. This encourages the person to adhere to a schedule in working on a goal. There can be a sense of security in the limits that are set for making a change, and these limits will help a person avoid procrastination in working toward a goal.

Change is often a fearful experience because it requires that a person let go of familiar and rewarding patterns of thinking, feeling, and behaving and take a risk with a new mode of experiencing. The phenomenon of fear of success is a last unconscious attempt by the person to undermine personal change and once again begin the self-defeating cycle. Step 23 helps the person think about ways to counteract this fear of success.

The final step in "Treatment Planning and Action" is that the person keep a daily or weekly diary recording gains made in achieving behavior change. A written record of rewards may be motivating and provide the final support system the person requires.

Summary of the Personal Paradigm Shift

The PPS is a systematic and structured model for personal behavior change and health care management that involves patients in observing, experiencing, and determining their own behavioral choice process. While seeking to educate patients in the process of making optimal health care choices, it instructs them in the process of learning how to learn about themselves. The PPS closely adheres to the assumptions of psychoeducational approaches as described by Larson (1984), and it meets most of the conditions thought to be important to lifestyle intervention (Benfari et al., 1981). The program assumes the patient is an active agent in the change process as he/she progresses through the four stages of health care awareness, decision making, generating oppositional alternatives, and treatment planning and action. Unlike other personal change programs found in the literature, the PPS is more detailed (24 steps), accounts for a larger number of mediating variables in personal change, and does not rely exclusively on the development of operant relationships. The PPS is designed as an adjunct treatment for patients who are involved in a regimen of medical treatment.

b
th
re
th
pa

ps
th
on
th
A
ar
Th
ap
mu
an
pa
car
are
dro
us

Sample

The subjects for the study were recruited from patients admitted by physicians to a chronic pain clinic in mid-Michigan, from April through July 1984. This clinic is a comprehensive, medically managed rehabilitation program for both inpatients and outpatients. Typically, the patient composition is about 70% outpatient and 30% inpatient, and patients come from all geographic areas of Michigan.

Staff of the clinic include a physician, a fully licensed psychologist, a licensed physical therapist, and an assistant physical therapist. Duration of the program is 1 week; patients receive an orientation to the clinic on Sunday evening, participate in treatments throughout the week, and are generally discharged on Friday afternoon. A few patients return the following week for particular treatments or are referred out for ongoing psychological and/or medical services. The treatment regimen consists of medical management, daily psychotherapy, twice-daily physical therapy treatments, exercise, biofeedback and muscle-relaxation training, vocational guidance, occupational therapy, and educational classes in the psychophysiology of chronic pain. All patients are referred to the clinic with the goal of obtaining significant relief from chronic pain. The most frequent admitting diagnoses are facet syndrome, degenerative disc disease, musculoskeletal syndrome, and back strain. The patients usually have been very active using health care services for pain relief.

Th

ex

co

in

ina

pa

int

the

gr

sub

thr

num

gro

42.

gro

gro

eve

age

sub

sma

rou

100

The

A total of 51 patients volunteered to participate in the study. Three patients initially accepted into the study were subsequently excluded because they left the clinic before all treatments were completed. There were three criteria for exclusion from participation in the study: evidence of organic brain damage, schizophrenia, and inability to read or write. The sample consisted of two groups: patients assigned to the experimental condition receiving the PPS intervention, and patients assigned to the control condition receiving the Discussion group intervention. Methods for assignment to the two groups are presented in detail in the Procedures section.

The demographic information for both the experimental group subjects and the control group subjects are presented in Tables 3.1 through 3.7. The two groups were composed of a nearly equivalent number of subjects: 26 in the PPS group and 25 in the Discussion group. The mean age of the PPS group and the Discussion group was 42.77 and 44.48 years, respectively. The racial composition of the two groups was quite similar, with Caucasians comprising over 80% of each group and the remainder largely composed of Blacks. The PPS group was evenly divided by sex, while the Discussion group had a higher percentage of females than males. Examination of the marital status of the subjects revealed that most subjects in both groups were married, and smaller percentages were single or divorced. Level of education was roughly equivalent between groups, with 91% of the Discussion group and 100% of the PPS group having earned at least a tenth-grade education. The employment status of the groups was roughly equivalent; more than

60% were either semi-skilled or unskilled, and about 11% of each group were skilled laborers. Using total raw scores obtained from the Shipley Institute of Living Scale (Shipley, 1940), estimated WAIS IQ scores were calculated for all subjects (Paulson & Lin, 1970). Both groups demonstrated mean estimated WAIS IQ's within the average range of intellectual functioning (an IQ between 90 and 110), although the mean estimated IQ for the PPS group was six points higher than that of the Discussion group. Appendix A illustrates the estimated IQ scores for all 12 weekly groups in the study.

Table 3.1: Age of Subjects

	PPS	Discussion
Mean	43.77	44.48
Median	40.00	46.00
Standard deviation	9.75	12.12

Table 3.2: Race of Subjects (in percent)

Race	PPS	Discussion
Asian	0	0
Black	12	13
Caucasian	88	83
Other	0	4

Tabl

Tab

S
M
W
D
S

Tab

Ele
Jun
Ser
Som
Col
Pos

Table 3.3: Sex of Subjects (in percent)

Sex	PPS	Discussion
Female	50	70
Male	50	30

Table 3.4: Marital Status of Subjects (in percent)

Category	PPS	Discussion
Single	11	15
Married	77	62
Widowed	0	4
Divorced	8	15
Separated	4	4

Table 3.5: Years of Education of Subjects (in percent)

Years	PPS	Discussion
Elementary (grades 1-6)	0.0	0.0
Junior high (grades 7-9)	0.0	7.5
Senior high (grades 10-12)	78.0	61.5
Some college	17.0	15.5
College graduate	4.0	11.5
Postgraduate	0.0	3.0

Ta

—

—

Ur
Se
Sk
Re
Un
Of
No

—

Ta

—

—

—

No
IC

em

(23

con

to

gro

cou

gro

to

Table 3.6: Work Composition of Subjects (in percent)

Category	PPS	Discussion
Unskilled	50.0	34.6
Semi-skilled	18.5	26.9
Skilled	11.5	11.5
Retired	3.8	3.8
Unemployed	0.0	11.5
Disability	14.0	3.8
No response	3.8	11.5

Table 3.7: Estimated WAIS IQ's of Subjects

	PPS	Discussion
Mean	104.58	98.42

Note: Shipley total raw scores were converted to estimated WAIS IQ's (Paulson & Lin, 1970).

At pretreatment, a greater percentage of the PPS group (41%) was employed or in a job-training program, compared to the Discussion group (23%). Fifty-two percent of the PPS group was receiving workman's compensation or some other income for pain (e.g., insurance), compared to 61% of the Discussion group. A greater percentage of the Discussion group (76%) reported that their pain interfered with sexual intercourse, compared to the PPS group (59%). Eighty-five percent of the PPS group subjects had had at least one surgery for pain relief, as compared to only 38% of the Discussion group subjects.

Using the present pain intensity (PPI) scale from the McGill Pain Questionnaire (MPQ) (Melzack, 1975), a 5-point scale of overall pain intensity (0 = none, 1 = mild, 2 = discomforting, 3 = distressing, 4 = horrible or excruciating), the PPS group had a mean rating of 3.02, compared to the Discussion group with a mean rating of 2.78, at pre-treatment. Patients were unable to reliably report the type and amount of medication they were taking for pain relief.

Instrumentation

Several written instruments were selected as operational measures of the primary hypothetical constructs in this study. They are the McGill Pain Questionnaire (MPQ) (Melzack, 1975), the Minnesota Multiphasic Personality Inventory (MMPI), and the Lifestyle Coping Inventory (Hinds, 1983). The Shipley Institute of Living Scale (Shipley, 1940) was used descriptively as an estimation of the current intellectual functioning of the subjects. In addition, a brief follow-up questionnaire regarding the health, pain, and employment status of the subjects was constructed (Appendix B).

Description of McGill Pain Questionnaire

The MPQ (Melzack, 1975) was selected as a verbal self-report measure of the pain experience (Appendix C). Melzack believed that many of the tools used to measure pain were limited because they described pain as though it were a specific sensory quality that varied only in intensity. The word "pain," according to Melack, refers to an endless variety of qualities which are categorized under a single linguistic label, not to a single sensation that varies only in intensity.

Melzack and Torgerson (1971) began the specification of the qualities of pain by asking groups of students, patients, and physicians to classify 102 pain-related words into smaller groups. Three main categories were obtained: (a) words that describe sensory qualities of pain, in terms of temporal, spacial, thermal, or other properties; (b) words that describe affective qualities, in terms of tension, fear, and autonomic properties of pain; and (c) evaluative words that describe the subjective overall intensity of the total pain experience. These three main categories were classified into 16 subcategories consisting of groups of words that were considered synonyms. Intensity values were assigned to each of the words, using a scale from least (or mild) to worst (or excruciating) pain.

Using the research tool developed in the Melzack and Torgerson (1971) study, several groups of patients with different illnesses were asked to describe their present pain (Melzack, 1975). It was concluded that four types of data could be obtained from the instrument: (a) a pain rating index based on the patients' mean scale values of the words in a given category, the PRI-(S); (b) a pain rating index based on the rank values of the words in a given category, the PRI-(R); (c) the number of words chosen across all categories; and (d) the present pain intensity, or the number-word combination chosen as an indicator of overall pain intensity at the time of administration, with 1 = mild,

2

In

re
Me
tiv
sca
val
pre
met

wor
pai
the
pati
sign
valu
pain
inte
32;
inde
meth
be a
susce
of pa

2 = discomforting, 3 = distressing, and 4 = horrible or excruciating. In the present study, the types of measures used were b, c, and d.

MPQ intercorrelational and reliability data. All of the MPQ data reported in this section are based on a series of studies reported in Melzack (1975). For all word categories (sensory, affective, evaluative), correlations of .90 or higher have been obtained between the scale and rank methods for determining the pain rating index. The rank value method of scoring the word descriptions of pain was used in the present study since it is more easily computed than the scale value method.

In Melzack's study, with a sample of 248 patients, the number of words chosen correlated .89 with the rank value method of computing the pain rating index. This high correlation is expected since the larger the number of words chosen, the higher the pain rating index. The patients' ratings of overall present pain intensity correlated significantly ($p < .01$) with the number of words chosen and the rank value method of computing the pain rating index for each category of pain descriptors. The correlation coefficients for the present pain intensity and each of the other indices were: number of words chosen, .32; pain rating index-rank method-sensory category, .29; pain rating index-rank method-affective category, .42; pain rating index-rank method-evaluative category, .49. The present pain intensity appears to be a more labile indicator of pain than the other indices and more susceptible to influence by variables other than the sensory dimensions of pain, such as the individual's present mood state.

On the average, the sensory word descriptors were chosen more frequently than the affective word descriptors (Melzack, 1975). Nearly all patients chose a word in the evaluative category even though there is no instruction that this represents a distinctive category. In investigating whether patients tend to choose words from the same subcategories on successive presentations of the questionnaire, an analysis of ten patients responding to three administrations of the MPQ at intervals ranging from 3 to 7 days revealed a mean consistency of 70.3%, with a range from 50% to 100% (Melzack, 1975).

Melzack (1975) reported mean values of each of the pain ratings for a number of individual pain syndromes. With a sample of 14 back pain patients (mean age of 48 years), a type of pain commonly found in the sample of patients in the present study, the following means were reported: mean present pain intensity, 2.6; mean number of words chosen, 10.9; mean pain rating index-rank method-sensory category, 14.0; mean pain rating index-rank method-affective category, 3.5; mean pain rating index-rank method-evaluative category, 3.3.

MPQ validity data. The MPQ has been found to meet commonly accepted psychometric stands of validity (Reading, 1983). During the past 8 years, the increase in the number of studies from a variety of clinical settings that include the MPQ as a dependent measure testifies to its face validity. Distinctive sensory, sensory-affective, and evaluative factors have emerged from an analysis of 102 back pain patients (McCreary, Turner, & Dawson, 1982), supporting the construct validity of the MPQ. In regard to concurrent validity, MPQ scores have been reported to be associated with analgesia requirements (Reading, 1983). Finally, the MPQ has been shown to be an efficient instrument in distinguishing among patient groups with various pain syndromes (Reading, 1983). Chronic pain involves more differentiation of the sensory, affective, and evaluative components than does acute pain (Reading, 1983). Chronic pain patients tend to use affective and evaluative word descriptors more frequently than acute pain patients.

Minnesota Multiphasic Personality Inventory (MMPI)

The MMPI is designed to provide an objective assessment of the major personality characteristics that influence personal and social adjustment. Hathaway and McKinley (1967) have discussed in detail the construction of the MMPI and the derivation of its scales.

Development of the MMPI scales proceeded by contrasting normal groups with carefully studied clinical cases. More than 800 such cases from the Neuropsychiatric Division of the University of Minnesota Hospital were used as normative data. The primary criteria for including an item on a particular scale was consistency of inclusion by sample patients already diagnosed as having a specific mental syndrome or condition.

MMPI reliability data. Reliability of the Hypochondriasis (Hs), Depression (D), Hysteria (Hy), and Psychasthenia (Pt) scales, the scales of interest in the present study, has been reported to be quite satisfactory. Hathaway and McKinley (1940, 1942) reported test-retest coefficients on 10 samples of 40 normal patients. Cottle (1950) reported 1-week test-retest coefficients for 100 normal subjects. Holzberg and Alessi (1949) reported test-retest coefficients for 30 psychiatric patients. The data from these studies are represented in Table 3.8.

In the present study, Form R of the MMPI was used as a pretreatment measure since this instrument was routinely administered at admission to all patients who entered the pain clinic. Form R permits all 14 basic scales to be obtained from the first 399 items. The test was administered according to standardized procedures described by Hathaway and McKinley (1967, p. 9). Thirteen overlay keys were used to hand score the answer sheet of the Form R. Raw scores were converted to appropriate *T* scores with a mean of 50 and a standard deviation of 10. Four scales of the MMPI were used in this study: Hypochondriasis (Hs), Depression (D), Hysteria (Hy), and Psychasthenia (Pt).

Table 3.8: Test-Retest Reliability Coefficients Reported for the MMPI

Scale		Hathaway & McKinley (1940,1942)	Cottle (1950)	Holzberg & Alessi (1949)
		Normals	Normals	Psychiatric
Hypochondriasis	(Hs)	.80	.81	.67
Depression	(D)	.77	.66	.80
Hysteria	(Hy)	.57	.72	.87
Anxiety	(Pt)	.74	.90	.72

Description of MMPI-168. A convenient short-form administration of the MMPI, the MMPI-168 (Overall & Gomez-Mont, 1974) was mailed to subjects at the 3-month follow-up point. The MMPI-168 comprises the first 168 items of Form R, and conventional scoring templates are used to obtain raw scores on each of the scales. This short form was used rather than Form R because it was felt that a shorter instrument would increase the return rate.

MMPI-168 reliability data. High correlations have been reported between the standard version of the MMPI and the abbreviated MMPI-168 for a sample of medical school patients and psychiatric patients with a wide variety of diagnoses (Overall & Gomez-Mont, 1974). Correlations ranged between .79 and .96 for all scales, with .96 for Hs, .94 for D, .92 for Hy, and .90 for Pt, the scales of interest in the present study.

Group and individual MMPI-168 data were analyzed in a study of psychiatric inpatients comprising 70 white males and 70 white females (Newmark, Newmark, & Cook, 1975). MMPI-168 items were taken from standard form MMPI protocols and were scored and converted into standard scale K-corrected raw scores. Two doctoral-level clinical psychologists concurred on 90% of the protocols for a general diagnosis. In most cases the standard deviation was smaller for the MMPI-168 than for the comparable standard MMPI. Paired t-tests yielded significant ($p <$ .001) mean differences between the two forms on only one scale, Social Introversion ($p < .001$) for both male and female subjects. For males, scale correlations ranged from .96 on Mania to .78 on Masculinity-Femininity (mean = .88, median = .89). For females, scale correlations ranged from .93 on Depression and Mania to .77 on Masculinity-Femininity (mean = .88, median = .90). All correlations were statistically significant ($p < .001$).

MMPI-168 validity data. The utility of the MMPI-168 in decision-making situations was assessed by determining the proportion of cases in which it led to accurate decisions about the validity, high points, and elevations of the corresponding standard MMPI profiles (Newmark et al., 1975). Criteria for valid profiles required that the three validity scales had T-scores ≤ 70. Of the standard MMPI profiles that were invalid, 88% of the male and 92% of the female subjects had corresponding invalid MMPI-168 profiles. Of the valid profiles, subjects' MMPI-168 scores permitted prediction of the one or two most elevated scales on their standard MMPI profiles in approximately 72% of the cases, with approximately the same prediction rate for both males and females. Agreement for general diagnostic categories (psychotic, neurotic, personality disorder) was 80% for males and 86% for females, with a combined agreement rate of 83%.

Unlike studies that have examined agreements in code-type classification of abbreviated and standard MMPI profiles, two studies have shown that the MMPI-168 should be expected to yield equally valid clinical decisions as the standard MMPI. Overall (1975) found that the accuracy of identifying psychiatric patients in a combined group of patients and normal college students was slightly superior when the MMPI-168 form was used, as compared with the standard 400-item MMPI. Also, the MMPI-168 was found to be slightly superior to the standard

MM
di

st
De
sc

ps
th
Br
Pa
po
ot
sc
to
sc
si

rel
dim
Hy
eva
can
sens

MMPI with respect to differential diagnosis among 10 major clinical diagnostic groups.

Raw MMPI-168 scale scores were converted in the present study to standard MMPI raw scores from a table provided by Overall, Higgins, and DeSchweinitz (1976). The conventional format for transforming raw scores into scale scores was then followed.

Relationship between MPQ and MMPI. The relationship between psychological disturbance and the description of pain, as measured by the MPQ, has been the subject of several studies (Bolyard, 1982; Bradley, 1983; McCreary et al., 1981; McCreary & Turner, 1977). Patients with high scores on the Hs, D, and Hy scales of the MMPI portray their pain as more intense than patients with high scores on other MMPI scales (McCreary et al., 1981). Patients with high Hs scale scores portray their pain in terms of affective and evaluative descriptors on the MPQ, whereas patients who have high scores on the D and Hy scales portray their pain in terms of the affective descriptor dimension alone.

Research has shown that these three MMPI scales are more highly related to the affective and evaluative dimensions than to the sensory dimension of the pain experience (McCreary & Turner, 1977). The Hs and Hy scales were found to correlate most highly with the affective and evaluative dimensions. The D and Pt scales did not correlate significantly with the affective dimensions and did not differentiate the sensory from the affective or evaluative dimensions.

High scores on the MPQ have been found to be indicative of psychological disturbance (Bolyard, 1982). Chronic pain patients scoring high on both the sensory and affective dimensions of the MPQ were more preoccupied with pain and perceived themselves as more handicapped than patients scoring low on both dimensions. In addition, the total MPQ score was found to be a better discriminator of psychological disturbance than scores on the sensory or affective dimensions.

Both male and female chronic pain patients with MMPI profiles characterized by elevations on scales Hs, D, and Hy, the neurotic triad, showed greater pain-related disturbances in their daily activities than did patients with relatively unelevated profiles or those with profiles characterized by elevations on both the neurotic triad scales and the Psychopathic Deviate and Schizophrenia scales (Bradley, 1983). It was suggested that chronic pain patients who have MMPI profiles with elevations on the neurotic triad scales suffer more intense pain than do patients with other types of MMPI profiles. Several investigators (Melzack & Wall, 1982; Sternbach, 1974; Watson, 1982; Woodforde & Mersky, 1972) have reported that chronic pain patients, as a group, have elevated scores (*T*-scores of 70 or above, i.e., a *T*-score that is at least two standard deviations above normal) on the Hs, D, and Hy scales. Sternbach and Timmermans (1975) concluded that "neuroticism" in chronic pain patients is a result of the chronic pain and may be reversible when the pain is reduced or abolished. Also, Leavitt and Garron (1982) concluded that magnification of mood-

admit

Descr
Insti

sampl

1940).

"intel

its g

curre

Pauls

Shipl

item

relat

final

10-mi

total

& Lin

fourt

group

score

from

tions

Banak

mood-related attributes of pain may be associated with more openly admitted psychological disturbance on the MMPI.

Description of the Shipley Institute of Living Scale

A brief estimate of the current intellectual functioning of the sample was obtained with the Shipley Institute of Living Scale (Shipley, 1940). Although the Shipley was originally designed as a measure of "intellectual impairment," research involving this scale has pointed to its greater utility in clinical settings as a brief indicator of current intellectual functioning (Bartz, 1968; Bartz & Loy, 1970; Paulson & Lin, 1970; Prado & Taub, 1966). Two scales comprise the Shipley: (a) a 40-word, multiple-choice vocabulary test and (b) a 20-item abstraction test in which the subject is asked to grasp the relationship involved in a progressive series of items and complete the final missing number of the series (Appendix C). Both scales have a 10-minute time limit. Raw scores from the two scales are summed into a total raw score and then converted to estimated WAIS IQ values (Paulson & Lin, 1970).

Standardization of the Shipley occurred on 1,046 students from fourth grade through college who had previously taken standardized group intelligence tests. Correlations between total raw Shipley scores and Full-Scale WAIS IQ's have been found to be high, ranging from .73 to .90 in a number of studies under various clinical conditions (Bartz, 1976; Stone & Ramer, 1965; Paulson & Lin, 1970; Wiens & Banaka, 1960). Reliability coefficients of .87, .89, and .92, respectively, were reported for the vocabulary, abstraction, and total raw scores (Shipley, 1940).

In a study investigating the relationship between the Shipley-Hartford and the Wechsler Adult Intelligence Scale (WAIS) as a function of age, 190 male and female psychiatric patients with varying diagnoses, and from different socioeconomic levels, were selected from three population samples (Paulson & Lin, 1970). It was found that the WAIS Full-Scale IQ score correlated .74 with the Shipley vocabulary raw score and .64 with the abstraction raw score. A correlation coefficient of .78 was reported between the total raw score (found by adding the vocabulary raw score with the abstraction raw score) and the WAIS Full-Scale IQ score.

Lifestyle Coping Inventory

The Lifestyle Coping Inventory (Appendix E) is a 142-item self-report inventory designed to assess an individual's present level of health behavior (Hinds, 1983). "Health behavior," according to Stone (1980), is broadly defined as all behaviors which have a significant impact on health. The includes behaviors with either a positive or a negative effect on health. The inventory was developed by gathering items that had face validity as measures of health behavior and that represented major categories of health behavior.

Seven major categories of health behavior are represented on the Lifestyle Coping Inventory. They are: (a) nutritional actions (20 items), e.g., "I eat two servings of vegetables daily"; (b) physical care actions (18 items), e.g., "I walk when possible rather than ride in an automobile"; (c) cognitive and emotional actions (37 items), e.g., "I share my feelings with others"; (d) low-risk actions (5 items), e.g., "I drive the speed limit"; (e) environmental actions (9 items), e.g., "I choose environments that are relaxing"; (f) social support actions (14 items), e.g., "I visit or talk to a good friend"; and (g) coping style actions (32 items), e.g., "I make my own decisions even though some people may not like them." Individuals respond to each declarative statement (e.g., "I admit my mistakes to others") by choosing one alternative among five possible choices: Choice A = Never (0% of the time), Choice B = Rarely (0-25% of the time), Choice C = Occasionally (25-50% of the time), Choice D = Often (50-75% of the time), and Choice E = Very Often (75-100% of the time). Point values are assigned to each choice (Never = 0, Rarely = 1, Occasionally = 2, Often = 3, Very Often = 4), and point values are added for the total score. Therefore, the higher the point total, the greater the number of health behaviors. In the present study, the total point score obtained by adding the seven behavioral categories is used.

The Lifestyle Coping Inventory was administered at pretreatment and at the 3-month follow-up. This instrument was chosen to measure changes in health behaviors as a result of the PPS treatment. Using the total scores obtained from the pretreatment administration of the Lifestyle Coping Inventory in the present study, the split-half reliability coefficient was reported to be .74.

Behavioral Outcome Measures

It is clear from previous research that chronic pain patients do not maintain positive behavior gains over time following their discharge from multicomponent pain treatment programs (Aronoff et al., 1983). This study hypothesizes that subjects who are trained in the behavior change model PPS and provided with a framework for making personal behavior changes and decisions about their health care will demonstrate maintenance of gains 3 months following pain clinic discharge.

To evaluate whether participants maintained behavior gains made in the treatment setting, a follow-up questionnaire was mailed to all subjects 3 months following discharge from the pain clinic program. Six outcome measures were of particular interest in measuring maintenance of gains:

1. Employment status.
2. Status of receiving income because of pain in the form of workman's compensation or some other payment.
3. Change in medically prescribed pain medication.
4. Pain interference with sexual intercourse.
5. Rehospitalization because of pain since discharge from the pain clinic program.
6. Overall level of pain intensity.

Procedures

Subjects in the study were recruited following their admission to the pain clinic. Each week, beginning on Sunday evening, a new group of patients entered the clinic. Patients who presented with primary complaints of chronic pain qualified for inclusion in the study. Exclusion criteria were discussed previously.

As soon as it was deemed clinically appropriate by the pain clinic staff, those patients who qualified for inclusion were informed by the experimenter about the nature of the study and asked if they would be willing to participate. Potential participants were told that the purpose of the study was "to investigate two methods for managing stress and pain, one that teaches personal problem solving and one that involves group discussion." They were also told that their decision to participate would not influence the treatments they would receive at the pain clinic. All patients were told that they would receive the usual and customary treatments from the staff. Once a patient agreed to participate, a consent form was obtained (see Appendix F).

All patients, whether or not they agreed to participate in the study, completed Form R of the MMPI and the MPQ as a customary admission assessment procedure. After each subject had signed a consent form, the group of subjects was randomly assigned to either the experimental condition (PPS) or the control condition (group discussion). For a total of 12 weeks, each new weekly group of subjects was assigned to either of the two conditions, resulting in six weekly groups of experimental subjects and six weekly groups of control subjects. The decision was made to randomly assign an entire weekly subject group to a treatment condition rather than randomly assigning individual subjects within each weekly subject group to a treatment for two reasons.

Typically, patients within each weekly group communicate frequently with one another during treatments and progress through the stages of group development often seen in therapy groups. Thus, possible contamination factors might have been introduced if weekly groups were split into experimental and control conditions. Clinic staff also felt that problems would be created in the smooth flow of the program if each weekly patient group was divided.

PPS Group

Six weekly patient groups were randomly assigned to the treatment condition and were taught the psychoeducational program PPS (Hinds, 1983). In keeping with the tenets of the educational model, the experimenter assumed the role of a "trainer," and the patients became the "trainees." The goal of the trainer was to present the concepts of behavior change of the PPS to the trainees in a meaningful way and guide them through the individual steps of this four stage model.

The trainer began by providing an introduction to and a rationale for the PPS. It was stated that the PPS is:

> a manual that teaches people the psychological skills necessary to understand their behavior and make changes in their behavior. PPS is a way to learn how to solve personal problems, manage stress, and make better decisions about how to improve emotional and physical health. The steps in the manual will help you to understand the relationship between your feelings, thoughts, body reactions, behaviors, and self-concept. In order to make the behavior changes you want, you need to understand these relationships. Some reading and writing will be a part of this program, but don't worry, there are no right or wrong answers. You are only asked to write what you think and feel at each of the 24 steps.

Group participants were instructed that their written responses to each of the steps were confidential but that the trainer would look them over if any participant so desired. Typically, group members shared responses and reactions to each step with one another, and active discussion began. Encouragement was given to ask questions and to make comments whenever the need arose. All participants received training in the PPS modules in a group, and no individual training was provided.

PPS training was divided into four 1-1/2-hour sessions occurring in the late morning from Tuesday through Friday of each week. Approximately one stage of the PPS model was taught each day, depending on the speed of the group members in comprehending the concepts and the amount of discussion generated. If a participant expressed confusion about the meaning of a particular step, the trainer clarified the step and gave examples. Participants who continued to express poor understanding were encouraged to write down whatever came into their minds, no matter how inaccurate it seemed. Group members were urged not to evaluate and critique their thoughts and feelings but to write whatever came into their awareness.

Certain steps in the PPS manual were particularly crucial and were given special attention. Step 1, "Your Personal Problem," is one example. The trainer emphasized that any problem could be selected to work on, and illustrations of types of problems that people can have (e.g, intrapersonal, interpersonal) were given. Participants did not have to choose some feature of chronic pain as their problem, although

ma
"a
pe
di
pa

me
th
ev

Di

gr
ex
di
ca
ma
"mo
ro

At
dis
lif

many did. The trainer discouraged patients from selecting problems "about other people," especially if the participant failed to own any personal responsibility for the situation. At times this was quite a difficult concept to explain, given the tendency of a number of patients to project blame for their problems onto others.

The PPS manual was distributed one stage per day so that group members were not overwhelmed with the material. The trainer suggested that patients review steps they found difficult to understand in the evening and return with questions the following session.

Discussion Group

Six weekly patient groups were randomly assigned to the control group, which involved a discussion format. In these groups, the experimenter assumed the role of a nondirective moderator of group discussion. The goal of the moderator was to assist the group in carrying on a discussion about general topics without adding new material or psychological concepts to the discussion. The term "moderator," as opposed to "trainer," best describes the experimenter's role in the discussion groups.

Introduction to the group discussion was as follows:

> We will be meeting here this week to talk with one another about managing stress and coping with pain. Sometimes when people have something in common with each other, like all of you do, it can be helpful to share personal experiences.

At that point, the moderator presented a general question or topic to discuss, such as, "How do all of you deal with the stress in your life?" or "When was it that you first noticed your pain?" The

s
c
t
t
m

se
In
of
the
ra

des
(Ca

wher
trea
repr

"subj

moderator was careful not to introduce new material into the discussion, especially concepts from the PPS model. The moderator was non-directive and permitted the discussion to proceed in whatever direction the group members wished. Although reflection was used as a communication tool, there was not an emphasis on uncovering feelings for each member. Thus, the group was not defined as "psychotherapy."

As with PPS groups, Discussion groups met for four 1-1/2-hour sessions in the late morning from Tuesday through Friday of each week. In addition to suggesting broad questions for discussion, the moderator often began a session by briefly summarizing some of the main themes of the previous day's discussion. In general, participants were free to raise whatever issues concerned them.

Design

The design in the study is a pretest-posttest control group design, with 3-month follow-up measures, a true experimental design (Campbell & Stanley 1963). This design takes the following form:

$$\begin{array}{cccccc} R & 0_1 & X & 0_2 & 0_3 \\ R & 0_4 & & 0_5 & 0_6 \end{array}$$

where R refers to randomization of weekly subject groups to separate treatments, X represents exposure of subjects to the PPS, and 0 represents measurement points of dependent variables.

The design is a hierarchical or nested design with the factor "subjects" nested in the factor "weekly groups," and the factor "weekly groups" nested in the factor "treatment condition." This design has also been referred to as the split-plot design (Keppel, 1973; Kirk, 1968). Since there are equal *n*'s in each of the cells (six weekly groups in each condition), the design is balanced. Figure 3.1 illustrates the overall design of the study.

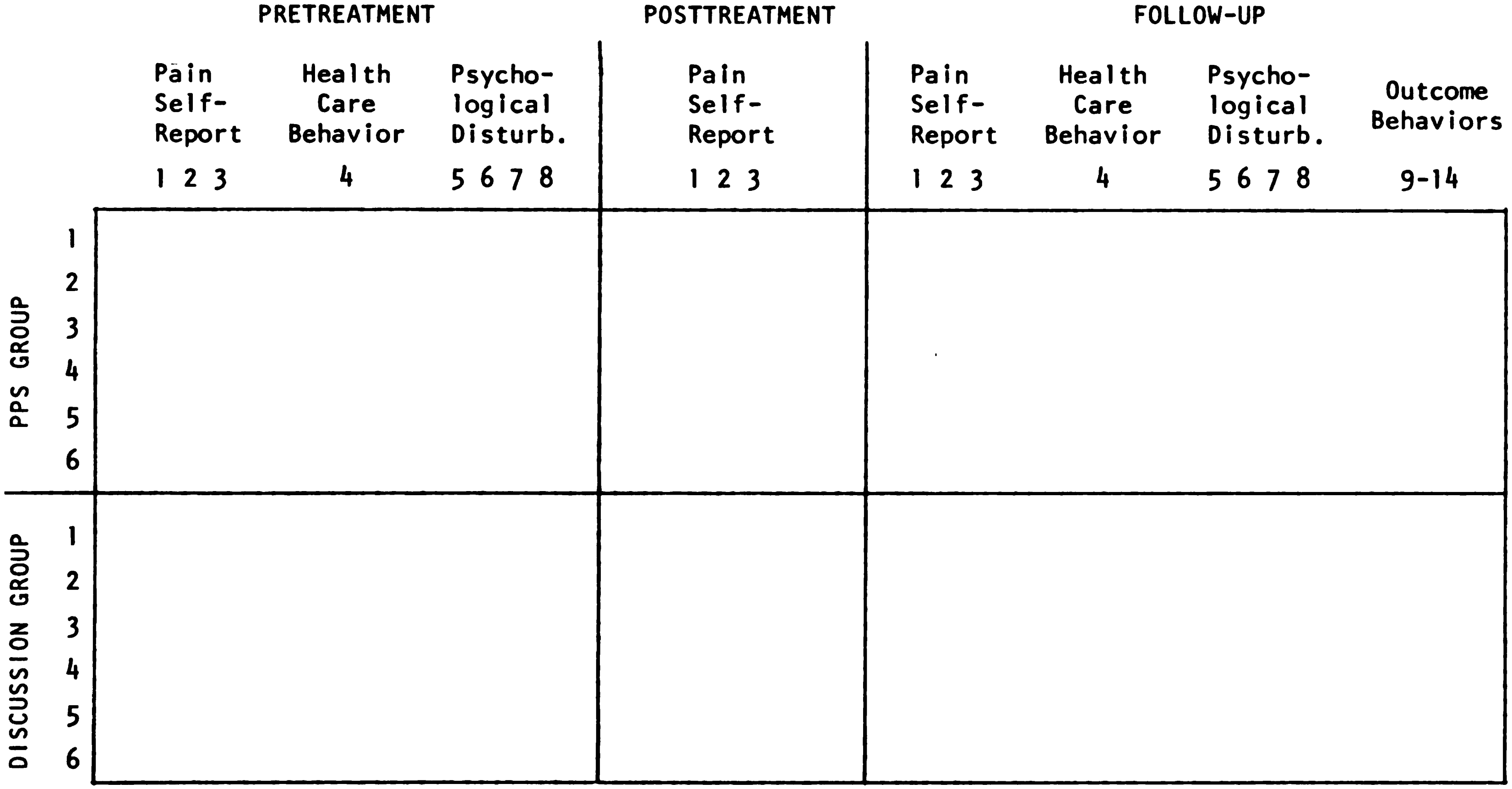
Hypotheses

The primary questions of interest in this study were:

1. Can a psychoeducational approach to personal problem solving and health care decision making improve the general health of chronic pain patients as measured by the quality of pain perceptions?
2. Can a psychoeducational approach to personal problem solving and health care decision making improve the general health of chronic pain patients as measured by performance of health care behaviors?
3. Can a psychoeducational approach to personal problem solving and health care decision making affect characteristic psychological disturbance in chronic pain patients?
4. Can a psychoeducational approach to personal problem solving and health care decision making assist chronic pain patients in maintaining behavior gains several months following termination of clinic treatment?

The following hypotheses were tested to answer these primary research questions.

PRETREATMENT POSTTREATMENT FOLLOW-UP



<u>DEPENDENT VARIABLES</u> (1 to 14)

1. $\bar{X}$ Sensory Pain Score
2. $\bar{X}$ Affective/Evaluative Pain Score
3. $\bar{X}$ Number of Words Chosen
4. $\bar{X}$ Total Coping Score
5. MMPI - $\bar{X}$ Hs T-Score
6. MMPI - $\bar{X}$ D $\bar{T}$-Score
7. MMPI - $\bar{X}$ Hy $\bar{T}$-Score
8. MMPI - $\bar{X}$ Pt $\bar{T}$-Score
9. Compensation Status
10. Employment Status
11. Rehospitalization
12. Medication Level
13. Pain Interference With Sex
14. Overall Pain Intensity

Figure 3.1: Overall design. (There are three general categories of dependent variables and three measurement points.)

1. H_o: The Personal Paradigm Shift groups will be no different than Discussion groups in reducing perceptions of pain on verbal pain report measures.

   H_a: The Personal Paradigm Shift groups will show larger reductions on verbal pain report measures than the Discussion groups.

2. H_o: The Personal Paradigm Shift groups will be no different than the Discussion groups in increasing health care behavior performance as measured by a health behavior inventory.

   H_a: The Personal Paradigm Shift groups will show larger increases in health care behavior performance on a health behavior inventory than the Discussion groups.

3. H_o: The Personal Paradigm Shift groups will be no different than the Discussion groups in reducing certain forms of psychological disturbance as measured by changes in elevations of several scales of personality functioning.

   H_a: The Personal Paradigm Shift groups will show larger reductions in certain forms of psychological disturbance as measured by several scales of personality functioning than the Discussion groups.

4. H_o: Subjects assigned to the Personal Paradigm Shift treatment will be no different than subjects assigned to the Discussion treatment in maintaining health gains 3 months following pain clinic discharge as measured by status on several behavior outcomes.

   H_a: Subjects assigned to the Personal Paradigm Shift treatment will maintain more health gains than subjects assigned to the Discussion treatment 3 months following pain clinic discharge as measured by status on several behavioral outcomes.

Analysis of Data

Group as Unit of Analysis

The procedure used in assigning subjects to treatments raises a question as to the appropriate "unit of analysis" in the study (Cox, 1958; Glass & Stanley, 1970; Hopkins, 1982; Lumsdaine, 1953). The unit of analysis is the smallest division of the collection of experimental subjects who have been randomly assigned to the different conditions in the experiment and who have responded independently of each other for the duration of the experiment. Hopkins (1982) stated that when the treatment is not administered individually to each subject, the statistical assumption of "independence of error" (p. 5) can be violated if individual scores (rather than group means) are used as the unit of analysis. Individual subjects did not respond to the treatment independently of each other but were exposed to group factors that may have affected their performance. Using the group as the unit of analysis satisfied the assumption of independence of error components.

Use of Raw Gain Scores

In this study, the primary interest was in measuring changes that occurred as a result of the PPS. To this end, gain scores or difference scores (Campbell & Stanley, 1963; Cox, 1958; Cronbach & Furby, 1970; Feldt, 1958; Keppel, 1973) were used to compare changes between the two groups, rather than using the procedure of comparing posttreatment (or follow-up) means. Gain scores are often used when the concomitant observation is a pretreatment score, as with parallel forms of a test. The gain score method is a statistical procedure for increasing precision, or reducing the standard error, by removing the initial differences between subjects on the pretreatment observation. It is a method that insures an unbiased estimate of treatment effects.

The raw gain score was computed by subtracting the pretreatment mean from the posttreatment mean, or by subtracting the pretreatment mean from the follow-up mean. The model for gain score analysis is $z = y - kx$, where z is the difference score, y is the posttreatment score, x is the pretreatment score, and k is the within-group regression coefficient.

Raw gain score analysis assumes (a) equality of population variances and (b) a within-group regression coefficient of 1.0. There is no cost of degrees of freedom when using raw gain scores, an important consideration in this study because of the small sample size.

Statistical Procedures

Four statistical procedures were used in this study: (a) multivariate analysis of variance (MANOVA), (b) analysis of variance (ANOVA), (c) student's *t*-test, and (d) chi-square. All of these procedures except chi-square assume normally distributed error variance, homogeneity of error variance, and independence of error components.

A multivariate analysis of variance (MANOVA) was performed on the mean gain scores of the three pain measures from the MPQ (sensory, affective/evaluative, number of words chosen) obtained by subtracting pretreatment group means from posttreatment group means. A second MANOVA was conducted on the gain scores of the three pain measures obtained by subtracting pretreatment from follow-up group means. MANOVA was selected as the appropriate statistical procedure because it controls for overall Type I error and it accounts for the correlations between all three pain measures. The simultaneous response of the experimental units contains more information about the total effect of the treatment than does the series of responses considered singly. Individual ANOVAs on each of the three pain measures were then examined for descriptive and discussion purposes.

A MANOVA was performed on the four MMPI scales (Hs, D, Hy, Pt) using gain scores obtained by subtracting the pretreatment means from the follow-up means. Individual ANOVAs for each of the four MMPI scales were then performed for explanatory purposes.

An ANOVA was performed on the total score of the coping inventory by using gain scores obtained by subtracting the pretreatment group means from the follow-up group means. ANOVA is robust with respect to violations of the normality and homogeneity assumptions, and the independence assumption was satisfied by using group as the unit of analysis.

Chi-square tests of the difference between two independent proportions were performed on all but one of the behavioral outcome measures taken at the 3-month follow-up. In these analyses, individual subjects are the unit of analysis, rather than groups. The use of this procedure makes the assumption of independent samples. This assumption was satisfied because the groups were randomly assigned.

A *t*-test of the difference between two means was performed on the remaining outcome measure, level of pain intensity.

Summary

The purpose of this study was to determine the effectiveness of a psychoeducational intervention for health care decision making and personal problem solving, the PPS, on the health of chronic pain

patients. For 12 consecutive weeks, each weekly group of patients admitted to a multicomponent chronic pain clinic in mid-Michigan was randomly assigned to one of two treatment conditions: the experimental condition, receiving the PPS (Hinds, 1983), or the control condition, participating in group discussion on managing stress and pain. Each group met for a total of 6 hours during the week subjects were in the clinic. All groups received the customary pain clinic treatments. The total number of subjects was 51 (experimental = 26, control = 25).

Dependent measures were collected at three time periods: pretreatment, posttreatment, and 3 months following termination of treatment at the pain clinic. The MPQ was administered at all three points, while the MMPI and the Lifestyle Coping Inventory (Hinds, 1983) were administered at pretreatment and 3-month follow-up. Six behavioral outcome measures were also collected at pretreatment and at follow-up.

The experimental unit of analysis was the group, since individual subjects did not receive treatment independently of one another. To increase precision and remove pretreatment differences, gain scores were obtained by subtracting pretreatment from posttreatment group means, and by subtracting pretreatment from follow-up group means. MANOVAs were performed on mean MPQ gain scores obtained from pretreatment to posttreatment and from pretreatment to follow-up. A MANOVA was also performed using mean pretreatment-follow-up gain scores on the four MMPI scales of interest. A one-way ANOVA was performed on the total coping score from the Lifestyle Coping Inventory using pretreatment-follow-up comparison. Chi-square tests of the difference between two independent proportions were conducted on five of these behavioral outcome measures, and a *t*-test was performed on the remaining outcome measure. Level of significance was set at .05 for each statistical procedure.

The results of the hypothesis tests and an interpretation of these results are presented in Chapters Four and Five.

CHAPTER 4

ANALYSIS OF RESULTS

In this chapter the results of the data analyses are presented. Each hypothesis is restated in testable form, and the results of the analyses are given, followed by a statement as to whether the hypothesis was accepted or rejected. The chapter is concluded with a summary of the hypotheses tests.

Follow-Up Return Rate

The design for this study (see Figure 3.1, Chapter Three) was a pretest-posttest control group design with follow-up. This design was employed to compare the effects of a psychoeducational intervention for health care decision making and a group discussion intervention on chronic pain patients. Three types of dependent measures were used: quality and quantity of pain perceptions, severity of psychological disturbance, and reported frequency of health behaviors. Six behavioral outcome measures were collected at 3-month follow-up to measure maintenance of gains. Descriptions of each of the dependent measures were provided in Chapter Three.

Twelve groups of subjects, randomly assigned to one of the two conditions, each received treatment by the same trainer for a 1-week period during the pain clinic stay. Of the total sample of 51 subjects, 41 returned packets of follow-up dependent measures mailed 3 months following discharge from the pain clinic, for a return rate of 80%. Table 4.1 illustrates group size at pretreatment, posttreatment, and 3-month follow-up.

Table 4.1: Size of Groups at Each Measurement Point

Week	Group	Measurement Point Pretest *n*	 Posttest *n*	 Follow-Up *n*
1	E	2	2	2
2	E	5	5	4
3	E	5	5	4
4	C	5	5	3
5	E	4	4	3
6	C	5	5	5
7	C	6	6	4
8	E	4	4	2
9	C	2	2	1
10	E	5	5	5
11	C	5	5	5
12	C	3	3	3
Total		51	51	41

<u>Note</u>: E = Experimental group--Personal Paradigm Shift
C = Control group--Group Discussion

At least one subject in each of the 12 weekly groups returned the mailed questionnaires. Five of the 12 groups retained all subjects at follow-up, and four groups lost only one member. The sizes of the experimental and control groups at pretest were *n* = 26 and *n* = 25, respectively. The sizes of the experimental and control groups at follow-up were n = 21 and n = 20, respectively. Therefore, the follow-up response rate between the two groups was equivalent.

Results

In this section, each of the hypotheses of the study is evaluated with the appropriate statistical analysis. A total of five statistical hypotheses are presented. Two hypotheses were constructed to test the effects of the PPS on pain perceptions, a pretreatment-posttreatment comparison and a pretreatment-follow-up comparison. One hypothesis each was constructed to test the effects of the PPS on health care behavior, certain forms of psychological disturbance, and maintenance of health gains. The analyses of all hypotheses except the maintenance hypothesis were performed on gain scores derived from either a pretreatment-posttreatment comparison or a pretreatment-follow-up comparison.

Hypothesis 1

The first hypothesis is concerned with changes in pain perceptions from pretreatment to posttreatment.

H_o: There will be no difference between the mean gain scores of the Personal Paradigm Shift group and the Discussion group on the three pain ratings from the McGill Pain Questionnaire (sensory, affective/evaluative, and number of words chosen) derived from the pretreatment-posttreatment comparison.

H_a: The Personal Paradigm Shift group's mean gain scores will be smaller than the Discussion group's mean gain scores on the three pain ratings from the McGill Pain Questionnaire (sensory, affective/evaluative, number of words chosen) derived from the pretreatment-posttreatment comparison.

The group means for the three pain ratings from the MPQ (sensory, affective/evaluative, number of words chosen) at all three measurement points for all 12 weekly groups are presented in Table 4.2.

The two groups demonstrated comparable mean scores at pretreatment on each of the three pain rating indices of the MPQ. These scores are similar to those reported for low back pain patients (Melzack, 1975). At posttreatment, both groups exhibited decreases for each pain measure, with the control group having slightly smaller scores than the experimental group. At the 3-month follow-up point, both groups exhibited increases in mean scores from the posttreatment levels, but the control group regressed to a level that was higher than the pretreatment level on two of the pain ratings, sensory and affective/evaluative. A graphic representation of the mean pain measures of the groups at all three measurement points is presented in Figures 4.1 through 4.3.

Gain scores for the three pain ratings of the MPQ were obtained by subtracting pretreatment scores from posttreatment scores. These data are presented in Table 4.3. Positive numbers indicate an increase and negative numbers indicate a decrease in perceived pain.

An examination of Table 4.3 reveals that both groups exhibited a reduction in perceived pain for each of the pain measures from pretreatment to posttreatment. Subjects in the control group showed greater variability in scores, as indicated by the larger standard deviations, particularly for the sensory pain rating.

Table 4.2: Mean McGill Pain Ratings at Pretreatment, Posttreatment, and Three-Month Follow-Up for Experimental and Control Groups

Group	McGill Pain Ratings[a]								
	Sensory			Affective/Evaluative			NWC		
	Pre $\overline{X}$	Post $\overline{X}$	Follow-Up $\overline{X}$	Pre $\overline{X}$	Post $\overline{X}$	Follow-Up $\overline{X}$	Pre $\overline{X}$	Post $\overline{X}$	Follow-Up $\overline{X}$
Experimental									
1 (n=2)	24.00	22.50	18.00	13.00	8.50	8.50	19.50	16.50	16.50
2 (n=5)	17.60	14.40	19.00	5.80	5.20	7.50	13.00	10.40	14.00
3 (n=5)	18.80	19.75	24.25	7.00	5.50	7.50	12.40	12.00	15.00
4 (n=4)	17.50	14.25	11.33	4.75	4.75	2.33	11.75	10.75	6.67
5 (n=4)	19.00	17.66	17.50	8.25	6.33	8.00	16.25	14.67	12.50
6 (n=5)	17.60	8.00	14.00	7.40	1.60	4.60	14.20	8.20	9.80
Grand means	19.08	16.10	17.35	7.70	5.31	6.40	14.52	12.10	12.41
Control									
1 (n=5)	22.40	24.00	25.67	8.80	8.20	12.33	17.00	14.20	17.00
2 (n=5)	14.60	17.40	13.00	3.40	3.40	3.80	10.40	11.80	11.20
3 (n=6)	17.67	20.17	22.75	5.83	5.17	7.25	14.16	12.83	16.25
4 (n=2)	18.50	5.00	8.00	3.00	1.00	2.00	13.00	4.00	9.00
5 (n=5)	19.80	8.40	19.60	9.20	1.40	7.00	16.40	6.60	13.80
6 (n=3)	18.50	20.10	19.30	6.05	5.40	7.10	13.80	12.80	14.30
Grand means	18.58	15.84	20.97	6.05	4.10	6.58	14.13	10.37	13.60

---

[a] Pain rating index based on rank values of the words (PRI-R) in each of the word categories sensory and affective/evaluative. NWC refers to total number of words chosen (Melzack, 1975).

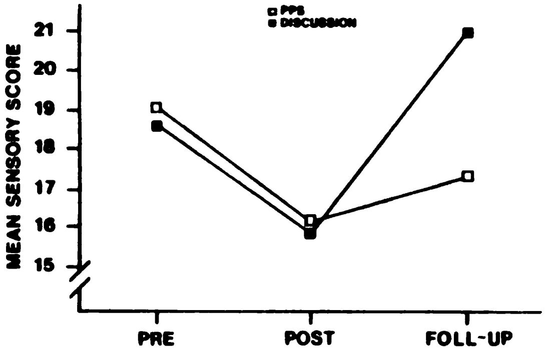


Figure 4.1: Mean sensory pain score of PPS and Discussion groups at three measurement points.

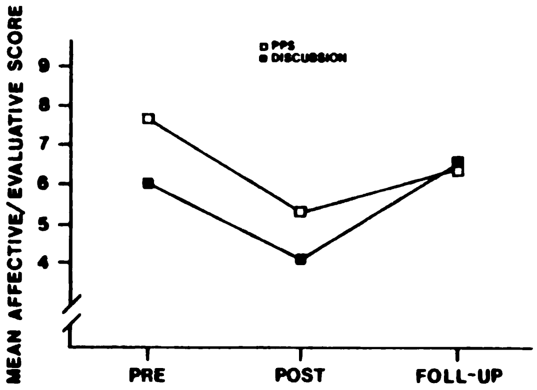


Figure 4.2: Mean affective/evaluative pain score of PPS and Discussion groups at three measurement points.

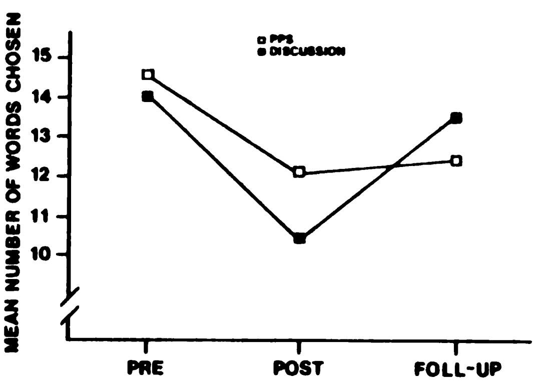


Figure 4.3: Mean number of words chosen pain score of PPS and Discussion groups at three measurement points.

Table 4.3: Mean Gain Scores (Pretreatment-Posttreatment) on McGill Pain Ratings for Experimental and Control Groups

Group	*n*	McGill Pain Ratings					
		Sensory		Aff/Eval		NWC[a]	
		$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Experimental	6	-2.99	3.58	-2.38	2.28	-2.43	1.99
Control	6	-2.73	7.57	-1.95	2.94	-3.75	4.58
Total	12	-2.86	5.65	-2.17	2.52	-3.09	3.44

Note: Tabled entries are mean group gain scores obtained by subtracting pretreatment means from posttreatment means.

[a] Number of words chosen.

A multivariate analysis of variance (MANOVA) was performed on the mean gain scores of the three pain ratings from the MPQ to determine whether there was a significant change between groups from pretreatment to posttreatment. The level of significance of the test was set at .05. Results of the test showed no significant difference between the groups, F (1, 10) = 2.87, $p > .05$. The null hypothesis was not rejected.

Although the results of the MANOVA were not significant, the results of each of the univariate ANOVAs of the pain measures are presented for illustration purposes in Tables 4.4 through 4.6.

Table 4.4: Results of ANOVA on Pre-Post Sensory Pain Measure

Source	*SS*	*df*	*MS*	*F*
Between	0.29	1	0.20	0.005 NS
Within	350.86	10	35.08	

Note: Tabled entries were computed using gain scores.

Table 4.5: Results of ANOVA on Pre-Post Affective/Evaluative Pain Measure

Source	*SS*	*df*	*MS*	*F*
Between	0.57	1	0.57	0.08 NS
Within	69.21	10	6.92	

Note: Tabled entries were computed using gain scores.

Table 4.6: Results of ANOVA on Pre-Post NWC[a] Pain Measure

Source	*SS*	*df*	*MS*	*F*
Between	5.27	1	5.27	0.42 NS
Within	124.99	10	12.49	

Note: Tabled entries were computed using gain scores.

[a] Number of words chosen.

Hypothesis 2

The second hypothesis compared changes in pain perceptions from pretreatment to 3-month follow-up.

H_o: There will be no difference between the mean gain scores of the Personal Paradigm Shift group and the Discussion group on the three pain ratings from the McGill Pain Questionnaire (sensory, affective/evaluative, number of words chosen) derived from the pretreatment-follow-up comparison.

H_a: The Personal Paradigm Shift group's mean gain scores will be smaller than the Discussion group's mean gain scores on the three pain ratings from the McGill Pain Questionnaire (sensory, affective/evaluative, number of words chosen) derived from the pretreatment-follow-up comparison.

The gain score data for the three pain ratings from the MPQ obtained by subtracting pretreatment mean scores from 3-month follow-up mean scores are presented in Table 4.7. Positive numbers indicate an increase and negative numbers indicate a decrease in perceived pain.

Table 4.7: Mean Gain Scores (Pretreatment-Follow-Up) of McGill Pain Ratings for Experimental and Control Groups

Group	*n*	McGill Pain Ratings					
		Sensory		Aff/Eval		NWC[a]	
		$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Experimental	6	-1.65	4.44	-1.29	2.33	-2.10	3.14
Control	6	-0.52	5.44	0.53	2.00	-0.53	2.29
Total	12	-1.09	4.78	-0.38	2.27	-1.32	1.32

Note: Tabled entries are mean group gain scores obtained by subtracting pretreatment means from follow-up means.

[a] Number of words chosen.

The experimental group maintained decreases in perceived pain on all three pain ratings, while the control group maintained decreases on two pain ratings but increase on one measure, affective/evaluative quality. The variability of the gain scores, indicated by the standard deviations, was quite similar for both groups.

A MANOVA was performed on the mean gain scores of the three pain ratings obtained by subtracting pretreatment mean scores from 3-month follow-up mean scores. The level of significance was set at .05. Results of the analysis were not significant, F (1,10) = .92, $p > .05$. The null hypothesis was not rejected in favor of the alternate hypothesis.

Although the results of this MANOVA were not significant, the univariate ANOVAs for each of the three McGill pain measures on the pretreatment-follow-up comparison are presented for illustration purposes in Tables 4.8 through 4.10.

Table 4.8: Results of ANOVA on Pre-Follow-Up Sensory Pain Measure

Source	SS	df	MS	F
Between	3.82	1	3.82	0.15 NS
Within	247.12	10	24.71	

Note: Tabled entries were computed using gain scores.

Table 4.9: Results of ANOVA on Pre-Follow-Up Affective/Evaluative Pain Measure

Source	*SS*	*df*	*MS*	*F*	
Between	10.03	1	10.03	2.13	NS
Within	46.96	10	4.96		

Note: Tabled entries were computed using gain scores.

Table 4.10: Results of ANOVA on Pre-Follow-Up NWC[a] Pain Measure

Source	*SS*	*df*	*MS*	*F*	
Between	7.39	1	7.39	0.98	NS
Within	75.70	10	7.57		

Note: Tabled entries were computed using gain scores.

[a] Number of words chosen.

Hypothesis 3

The third hypothesis is concerned with change in performance of health care behaviors.

H_o: There will be no difference between the mean gain scores of the Personal Paradigm Shift group and the Discussion group obtained from the Lifestyle Coping Inventory total scores at pretreatment and 3-month follow-up.

H_a: The Personal Paradigm Shift group's mean gain score will be greater than the Discussion group's mean gain score obtained from the Lifestyle Coping Inventory total scores at pretreatment and 3-month follow-up.

The Lifestyle Coping Inventory was administered only at pretreatment and follow-up because it measures change in behaviors initiated by patients after they left the pain clinic. The mean scores on the Lifestyle Coping Inventory for the six experimental and six control groups obtained at pretreatment and 3-month follow-up points are presented in Table 4.11.

The range for the 12 weekly groups in the study was 78 points, from a low score of 287.00 to a high score of 361.33. As seen in Table 4.11, both the experimental and the control groups demonstrated an increase in grand mean coping scores from pretreatment to 3-month follow-up.

The mean gain score data for the coping scores obtained by subtracting pretreatment mean scores from 3-month follow-up mean scores are presented in Table 4.12. The experimental group demonstrated a larger increase in coping scores than did the control group. In addition, the experimental group showed more variability in gain scores, as indicated by the larger standard deviation.

To test the third hypothesis, a one-way analysis of variance (ANOVA) was performed on the mean gain score data for the groups on the Lifestyle Coping Inventory. Results of ANOVA were not significant, $\underline{F}(1,10) = 0.72$, $\underline{p} > .05$. The null hypothesis was not rejected in favor of the alternate hypothesis.

Table 4.11: Mean Total Lifestyle Coping Inventory Scores at Pretreatment and Follow-Up for Experimental and Control Groups

Group	Pretreatment $\bar{X}$	Follow-Up $\bar{X}$
Experimental		
1 (n=2)	296.00	344.50
2 (n=5)	320.80	298.50
3 (n=5)	317.20	323.00
4 (n=4)	264.25	298.67
5 (n=4)	283.75	323.00
6 (n=5)	304.40	312.20
Grand mean	297.73	316.64
Control		
1 (n=5)	360.75	361.33
2 (n=5)	293.80	287.00
3 (n=6)	305.80	342.50
4 (n=2)	355.00	346.00
5 (n=5)	316.00	339.60
6 (n=3)	293.33	294.67
Grand mean	320.78	328.52

Note: Total possible score is 568 points.

Table 4.12: Gain Score Data on Lifestyle Coping Inventory for Pretreatment-Follow-Up Comparison for Experimental and Control Groups

Group	n	X	SD
Experimental	6	18.91	26.54
Control	6	7.74	18.30
Total	12	13.32	22.51

Note: Tabled entries are group mean gain scores.

Hypothesis 4

The fourth hypothesis is concerned with reductions in characteristic forms of psychological disturbance in chronic pain patients.

H_0: There will be no difference between the mean gain scores of the Personal Paradigm Shift group and the Discussion group obtained from mean *T*-score elevations on the Hypochondriasis (Hy), Depression (D), Hysteria (Hy), and Psychasthenia (Pt) scales of the Minnesota Multiphasic Personality Inventory (MMPI) at pretreatment and follow-up.

H_a: The Personal Paradigm Shift group's mean gain score will be smaller than the Discussion group's mean gain score obtained from mean *T*-score elevations on the Hypochondriasis (Hy), Depression (D), Hysteria (Hy), and Psychasthenia (Pt) scales of the Minnesota Multiphasic Personality Inventory (MMPI) at pretreatment and follow-up.

The mean *T*-scores on the Hs, D, Hy, and Pt scales of the MMPI profiles obtained at pretreatment and 3-month follow-up are presented in Table 4.13. At pretreatment the experimental group exhibited higher elevations on each scale than did the control group. Table 4.14 illustrates the mean elevations on the entire MMPI profile for the experimental and control groups. Further pretreatment differences observed between the experimental and control groups on several scales (F, Pd, Pa, Sc, Ma) are difficult to account for since the groups were randomly assigned to treatment conditions. These differences suggest that the experimental group was more psychologically disturbed than the control group.

Table 4.13: Mean MMPI T-Scores at Pretreatment and 3-Month Follow-Up for Experimental and Control Groups

Group	n	MMPI Scale							
		Hs		D		Hy		Pt	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Pre									
Experimental	6	73.37	2.09	77.76	3.94	76.74	3.49	72.74	5.36
Control	6	72.13	7.77	64.23	6.24	72.21	5.67	60.04	3.53
Follow-Up									
Experimental	6	72.95	7.12	75.32	7.02	72.86	4.71	66.93	19.22
Control	6	71.05	8.50	65.85	5.07	69.98	4.80	56.20	5.89

The gain score data obtained by subtracting pretreatment group mean T-scores from follow-up group mean T-scores for the four MMPI scales of interest, Hs, D, Hy, and Pt, are presented in Table 4.15. A negative number signifies a decrease in the elevation of a scale, toward normality, and a positive number signifies an increase in elevation, toward psychological disturbance.

Table 4.14

Table 4.14: Mean MMPI Profiles at Pretreatment and Three-Month Follow-Up for Experimental and Control Groups

Group	MMPI Scale											
	L	F	K	Hs	D	Hy	Pd	Pa	Pt	Sc	Ma	Si
Experimental												
Pretreatment												
1	46.50	68.00	58.00	81.00	77.00	83.50	76.00	67.00	82.50	82.00	67.50	52.50
2	45.00	61.00	47.40	79.20	76.60	76.60	77.80	71.00	73.40	50.60	58.00	56.80
3	51.80	53.40	55.40	78.20	71.80	74.40	63.80	60.00	68.80	69.80	56.80	55.20
4	48.75	65.00	52.75	80.00	84.75	78.50	75.50	73.75	72.75	76.25	58.50	64.00
5	47.50	61.00	46.50	77.25	80.00	74.25	71.00	62.25	65.00	70.25	64.00	57.25
6	54.20	55.40	55.80	74.60	76.40	73.20	62.80	56.40	74.00	65.00	53.20	65.40
Follow-up												
1	50.00	66.50	45.50	64.00	73.50	76.00	76.00	81.00	70.00	81.00	74.50	55.50
2	49.75	77.75	42.75	73.00	82.25	72.25	76.50	73.75	70.50	73.50	63.50	57.25
3	54.25	59.50	51.75	67.25	66.50	67.25	59.50	58.50	60.75	61.25	53.50	58.50
4	56.33	65.67	54.67	76.67	69.00	71.00	65.33	73.67	58.33	65.00	56.67	59.33
5	54.50	81.00	53.00	86.00	86.50	81.50	72.00	57.00	76.00	80.00	71.50	63.50
6	60.00	59.40	53.00	70.80	74.20	69.20	58.40	61.40	66.00	70.20	57.60	63.00
Control												
Pretreatment												
1	58.00	60.00	53.60	84.60	71.60	80.00	61.60	57.40	63.20	67.40	57.60	56.40
2	46.80	62.40	48.60	65.60	67.20	67.00	65.00	59.80	61.60	68.40	57.60	55.60
3	60.50	49.33	59.60	72.67	66.67	77.67	55.17	52.83	59.67	57.83	53.17	54.00
4	46.50	52.50	57.50	60.00	55.00	64.50	49.50	59.00	52.50	47.00	45.50	51.50
5	40.60	51.80	55.20	75.60	56.40	69.20	57.80	57.00	61.80	59.00	51.20	51.00
6	55.10	57.20	53.90	74.29	68.49	74.90	60.60	56.70	61.50	64.54	56.12	55.33
Follow-up												
1	56.00	67.50	58.50	83.00	62.50	74.50	57.50	57.00	63.50	66.50	54.50	53.50
2	52.40	61.60	49.60	63.80	70.20	66.80	61.50	57.00	55.00	62.40	66.80	59.80
3	61.00	71.75	59.00	75.75	64.75	77.50	53.25	56.00	53.00	57.00	50.67	57.25
4	45.00	60.00	62.00	57.00	58.00	63.00	54.00	68.00	46.00	53.00	39.00	52.00
5	53.80	56.40	52.20	71.40	66.00	68.40	56.20	62.20	57.40	63.60	50.20	56.20
6	55.00	60.67	55.67	75.33	73.67	69.67	74.67	58.00	62.33	64.67	57.33	54.33

Note: Mean K-corrected T-scores are represented.

Table 4.15: Mean Gain Scores (Pretreatment-Follow-Up) on MMPI Scales for Experimental and Control Groups

Group	n	Hs		D		Hy		Pt	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Experimental	6	-5.42	8.64	-2.43	8.15	-3.87	5.67	-5.81	9.16
Control	6	-1.08	2.68	1.63	6.44	-2.23	2.47	-3.84	3.52
Total	12	-3.25	6.51	-0.40	7.32	-3.05	4.26	-4.82	6.69

Note: Mean group gain scores were obtained by subtracting pretreatment means from follow-up means.

T-scores for the experimental group decreased on all four scales of the MMPI from pretreatment to 3-month follow-up. The control group showed decreases in T-score elevations on all scales except the D scale, where a slight increase was shown. The experimental group demonstrated larger decreases than the control group in mean T-score elevations on all four scales. In addition, the experimental group showed greater variability in gain scores than the control group, as indicated by the standard deviations.

To test the fourth hypothesis, a MANOVA was performed on the mean gain scores for the four MMPI scales and was found to be nonsignificant, $F\ (1,10) = 0.78,\ p > .05$. The null hypothesis of no difference was not rejected in favor of the alternate hypothesis.

f

ic

.

al

S

Be
(i

ic

Ta

S

Be
W

No

Although the MANOVA was not found to be significant, the results of the univariate ANOVAs for each of the MMPI scales under consideration are presented for illustration purposes in Tables 4.16 through 4.19.

Table 4.16: Results of ANOVA on Pre-Follow-Up Hypochondriasis Scale

Source	SS	df	MS	F
Between	56.55	1	56.55	1.38 NS
Within	409.48	10	49.45	

Note: Tabled entries were computed using gain scores.

Table 4.17: Results of ANOVA on Pre-Follow-Up Depression Scale

Source	SS	df	MS	F
Between	49.45	1	49.45	0.92 NS
Within	539.50	10	53.95	

Note: Tabled entries were computed using gain scores.

Table 4.18: Results of ANOVA on Pre-Follow-Up Hysteria Scale

Source	SS	df	MS	F
Between	8.08	1	8.08	0.24 NS
Within	191.65	10	19.16	

Note: Tabled entries were computed using gain scores.

Table 4.19: Results of ANOVA on Pre-Follow-Up Psychasthenia Scale

Source	SS	df	MS	F
Between	11.66	1	11.66	0.24 NS
Within	481.71	10	48.17	

Note: Tabled entries were computed using gain scores.

Hypothesis 5

The fifth hypothesis, a hypothesis about subjects' behavior, concerns maintenance of health gains 3 months following pain clinic treatment. In this case, individual subjects are the unit of analysis, rather than subject group. Therefore, all subjects in the experimental condition (PPS) are compared with all subjects in the control condition (Discussion). Comparisons are performed only using follow-up data, obtained for 21 subjects in the PPS group and 20 subjects in the discussion group.

H_o: There will be no difference at follow-up between the proportion of subjects who received the Personal Paradigm Shift intervention and subjects who received the Discussion intervention in their status on each of the six behavioral outcome measures.

H_a: At follow-up, a greater proportion of subjects who received the Personal Paradigm Shift intervention compared to subjects who received the Discussion intervention will demonstrate gains on each of six behavioral outcome measures.

Six behavioral outcomes were assessed at the 3-month follow-up point:

1. Employment status
2. Receiving income for pain in the form of workman's compensation or some other reimbursement
3. Extent of medication use
4. Pain interference with sexual intercourse
5. Rehospitalization for pain
6. Level of overall pain intensity

Employment status. The proportion of subjects in each treatment condition who were gainfully employed, full or part time, or who were involved in a job-training program, was assessed at the 3-month follow-up point. It was found that 40% (n = 8) of the PPS subjects and 24% (n = 5) of the Discussion group subjects were employed. A chi-square test of the significance of the difference between independent proportions was used to determine if this difference was significant. Results were not significant, χ^2 (1, N = 41) = 1.24, p > .05. The null hypothesis was not rejected.

Receiving income for pain status. The proportion of subjects in each treatment condition who were receiving income for pain at the follow-up point was assessed. It was found that 53% (n = 10) of the PPS group and 57% (n = 12) of the Discussion group were receiving workman's compensation or some other form of income for their pain. Results of chi-square test were found to be not significant, χ^2 (1, N = 40) = .08, p > .05. The null hypothesis was not rejected in favor of the alternate hypothesis.

Extent of medication use. Level of pain medication use was evaluated by asking subjects to compare amount of pain medication they were taking at 3-month follow-up with the amount at pretreatment. Four choices were available: (a) taking no medication for pain, (b) taking less medication for pain, (c) taking more medication for pain, and (d) no change between now and then in medication for pain. Categories of choices were collapsed so that the none/less choices constituted one category and the same/more choices constituted the other category. A chi-square test of the significance of the difference between independent proportions was performed. It was found that 65% (n = 13) and 55% (n = 11) of the PPS and Discussion groups, respectively, were either taking less medication at follow-up than at pretreatment or were taking no medication. The test was not significant, χ^2 (1, N = 40) = .08, p > .05. The null hypothesis was not rejected.

Pain interference with sexual intercourse. The proportion of subjects in each treatment condition who indicated that their pain interfered with sexual intercourse was assessed. It was found that 58% (n = 11) of the PPS subjects and 81% (n = 17) of the Discussion subjects experienced pain interference with sexual intercourse. A chi-square test of the difference between independent proportions was performed and was not significant, χ^2 (1, $N = 40$) = 2.53, $p > .05$. The null hypothesis was not rejected.

Rehospitalization for pain. It was hypothesized that the proportion of subjects in the PPS group who were rehospitalized for treatment of chronic pain would be significantly less than the proportion of subjects in the Discussion group who were rehospitalized. Only two subjects in each of the treatment groups were rehospitalized, demonstrating no significant difference between the groups, and eliminating the need for a statistical analysis.

Level of overall pain intensity. The Present Pain Intensity scale of the MPQ was used to assess overall pain intensity at follow-up. Subjects were asked the following: Which one word describes your pain right now? Five choices with a point value assigned to each choice were available: none (0), mild (1), discomforting (2), distressing (3), horrible or excruciating (4). The mean Present Pain Intensity scores for the PPS and Discussion groups were 2.35 and 2.80, respectively, with the PPS subjects demonstrating a lower level of pain intensity at follow-up. Results of a t-test were not significant ($t = -1.47$, $df = 38$, $p > .05$). The null hypothesis was not rejected in favor of the alternate hypothesis.

Summary

A series of hypotheses were tested to determine the effect of the psychoeducational intervention PPS on pain perception, health care behavior, and characteristic psychological disturbance of chronic pain patients. Maintenance of health gains was also tested. The statistical procedures used to test the hypotheses were MANOVA, ANOVA, chi-square, and _t_-test.

Hypotheses 1 and 2 predicted differences between the PPS group and the Discussion group on pain perceptions, one predicting differences at posttreatment and the other predicting differences at follow-up. In both cases, the null hypothesis was not rejected at the .05 alpha level.

Hypothesis 3 predicted differences between the PPS group and the Discussion group on performance of health care behaviors. The null hypothesis of no differences was not rejected at the .05 alpha level.

Hypothesis 4 predicted differences between the PPS group and the Discussion group on characteristic psychological disturbance found in chronic pain patients. The null hypothesis of no differences was not rejected at the .05 alpha level.

Hypothesis 5 predicted differences between the PPS group and the Discussion group on several behavioral outcomes at follow-up: employment status, receiving income for pain, extent of medication use, pain interference with sexual intercourse, rehospitalization for pain, and level of pain intensity. The null hypothesis was not rejected at the .05 alpha level for any test of this hypothesis.

In Chapter Five, a summary of the study is presented. Results of the study are discussed, along with limitations. Finally, implications for future research are proposed.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The major purpose of this study was to assess the effects of the psychoeducational intervention Personal Paradigm Shift on perceptions of pain, health care management behavior, and certain forms of psychological disturbance in chronic pain patients. In this chapter, a summary of the study is presented, followed by a discussion of the results and limitations of the study. Finally, implications for future research with psychoeducation and chronic pain patients are discussed.

Summary

The purpose of this study was to determine the impact of a psychoeducational intervention for health care management and personal problem solving, PPS, on pain perception, health care behavior, and psychological disturbance in patients at a multicomponent pain clinic. The need for this study emerged from several observations: climbing health care costs, disappointing maintenance of gains in the treatment of chronic pain patients, and poor problem-solving abilities in these patients. In conjunction with a multicomponent, medically prescribed pain treatment program, it was hypothesized that the PPS would assist patients in identifying important psychological, environmental, and psychosocial variables that influence chronic pain and health. Unlike interventions that demand patient compliance, the PPS involves the patient in an educational process of observing and determining the choices made for personal health care. The PPS teaches the patient how to make personal change.

The theoretical underpinnings of the PPS arise from the tradition of the educational model of service delivery. A pervasive feature of this model is that the most important aspects of human behavior result from experience or learning. In contrast to the illness model, the educational model assumes that the individual is lacking or deficient in the personal and interpersonal skills for effective, satisfying daily living. Clients are engaged in a process of goal setting and are actively and deliberately taught skills for goal attainment and satisfaction.

It was argued that the PPS involves the patient in observing, experiencing, and determining his/her own choice process in personal health care. As an adjunct to a traditional medical treatment regimen, the PPS assists the patient in identifying the psychological and psychosocial variables that influence chronic pain and general health and provides a structure for making personal change.

The PPS closely follows several tenets associated with the use of psychoeducational interventions: (a) the psychologist becomes a teacher to the patient, (b) patient problems are viewed as competency deficits, and (c) patients actively participate in solving their own problems.

Four areas of literature were reviewed: features of psychoeducational interventions with a focus on problem-solving programs; coping skills training and self-control; psychology of chronic pain; and a brief summary of existing psychological interventions for chronic pain, with a review of follow-up pain studies.

A common feature of general behavior change manuals, problem-solving manuals, and coping skills training is the goal of teaching patients a set of principles which have application to a variety of personal problems. Personal problem-solving manuals typically instruct the patient through a five-stage process of behavior change: (a) general orientation, (b) problem definition and formulation, (c) generation of alternatives, (d) decision making, and (e) verification. These manuals are usually logical and teach operant principles of behavior change.

Specific contributions to increasing a patient's response repertoire in coping with problems from the cognitive-behavioral arena are coping skills training and self-control. Training in the fundamental role of cognitions in personal problems, the process of self-monitoring, and principles of problem solving mark coping skills programs. A closely related area, self-control, is concerned with the individual becoming the principal agent in guiding, directing, and controlling those features of behavior that lead to desired positive consequences.

This study was carried out with a sample of chronic pain patients. Chronic pain is a multifaceted phenomenon, ultimately defined by the experiencer, with clear psychological and motivational components. Psychological mechanisms, such as coping styles and other cognitive-affective mechanisms, influence pain perception and response. Pain treatment programs combine several psychological interventions into a comprehensive approach, including operant conditioning, cognitive-behavioral techniques, and muscle-relaxation methods. These interventions have demonstrated effectiveness in alleviating pain and assisting the patient in coping with pain.

Follow-up studies of multicomponent pain programs often demonstrate good results immediately following treatment but show regression in patients months after discharge from treatment. Shortcomings of these studies include use of questionable outcome measures, inappropriate comparison groups, and small sample sizes.

For 12 consecutive weeks, each weekly group of patients admitted to a multicomponent pain clinic of an urban hospital was randomly assigned to one of two treatment groups. One group received the psychoeducational intervention, PPS; the other participated in group discussion about pain and stress. Thus, each treatment condition comprised six groups of patients. All patients received the customary pain clinic treatments. A total of 51 subjects participated in the study.

Dependent measures were collected at three periods: pretreatment, posttreatment, and 3-month follow-up. The instruments were the McGill Pain Questionnaire, the Minnesota Multiphasic Personality Inventory, and the Lifestyle Coping Inventory, a self-report measure of health care behaviors spanning a variety of domains. Several behavioral outcome measures indicative of maintenance of gains were also assessed at follow-up.

Three pain rating indices from the MPQ were computed at all three measurement points: a mean sensory score, mean affective/evaluative score, and mean number of words chosen. Mean elevations on the Hs, D, Hy, and Pt scales of the MMPI were assessed at pretreatment and follow-up. A total mean score from the Lifestyle Coping Inventory, representing number and frequency of performance of health behaviors, was assessed at pretreatment and follow-up. Follow-up was completed by mail, and an 80% return rate was noted, with an equivalent response rate for each group.

A pretest-posttest control group design with follow-up measures was used to test the hypotheses. The unit of analysis was designated as the weekly group since individuals within groups were not independent of one another. Analyses were performed using mean gain scores (post minus pre and follow-up minus pre) as the observations. Two MANOVAs were performed on the mean gain scores of the three pain measures, one examining the pretest-posttest comparison, the other examining the pretest-follow-up comparison; no significant differences were found between groups for either test at the .05 level of significance.

A MANOVA was performed on mean gain score observations obtained from the pretest-follow-up comparison on the four MMPI scales, and no significant difference was observed between the groups at the .05 level of significance. A one-way ANOVA was computed using mean gain scores obtained from the pretest-follow-up comparison on the total mean coping scores on the Lifestyle Coping Inventory, and no significant differences between groups were found at the .05 level of significance.

Chi-square tests of the difference between two independent proportions on each of five outcome measures (employment status, compensation status, pain interference with sexual intercourse, rehospitalization for pain, and extent of medication use) did not reveal any significant differences between groups at the .05 level. A *t*-test performed on the sixth outcome measure, level of pain intensity, also was nonsignificant at the .05 level.

Close examination of the data revealed that, despite the absence of statistically significant differences between groups, for 10 of the 11 total dependent measures, the mean gain scores for the PPS group were greater in the hypothesized direction than the mean gain scores for the Discussion group.

Discussion

The results of this treatment study did not demonstrate support for the original hypotheses. It was found that groups of chronic pain patients who received the psychological intervention PPS did not significantly differ from patient groups who participated in group discussion on stress and pain in reducing pain perceptions, increasing performance of health care behaviors, or modifying the severity of characteristic psychological disturbance often seen in chronic pain patients. Also, the PPS groups were not significantly better than discussion groups in maintaining gains 3 months following treatment, as indicated by several behavioral indices. A discussion of these results with implications for theory and limitations of the study is now presented.

Pain Perceptions

Changes in perceptions of the pain experience as measured by the type and number of word descriptors chosen on the MPQ were not significantly different between groups from pretreatment to posttreatment or from pretreatment to follow-up. The relationship between the personal skills acquired through the PPS and the perception of pain may be understood in two ways. In keeping with the principles of the gate-control theory of pain (Melzack & Wall, 1965), learning skills for managing the internal environment (affects, cognitions) through an intervention like the PPS would seem to influence the experience and therefore the report of pain. On the other hand, subjects in the study were not required to choose "managing chronic pain" as the personal theme to be examined in the PPS. Many varieties of personal problems were chosen. Perhaps it is unreasonable to assume that a verbal pain report would be affected by an intervention that did not deal exclusively with the pain experience. Furthermore, since the MPQ was the only instrument that specifically addressed pain, and relief from pain was the patients' primary goal, at 3-month follow-up patients may have used the instrument as a cry for help or as a means of seeking attention of staff if they were experiencing psychological distress. Finally, a further factor contributing to nonsignificance was some patients' lack of attention to the instructions to circle words that described "present" pain. There is no way to be certain that patients were not also reporting verbal descriptions of past or familiar pain.

The groups reduced pain perceptions at approximately the same rate from pretreatment to posttreatment. The PPS group retained this level of gains at follow-up, while the control group regressed to pretreatment levels, although this difference was not statistically significant. Perhaps the PPS group required more time to integrate the behavior change concepts, and therefore a difference between groups could have been detected over a longer follow-up period. If a later measurement demonstrated continued slight improvement for the PPS group and continued regression for the control group, it would suggest that the PPS subjects had internalized the health care management process.

Health Care Behavior

The difference between the changes in the two groups from pretreatment to follow-up in performance of health care behavior was found not to be significant. However, the PPS group exhibited a larger gain, increasing 18.91 points as compared to the control group's 7.73 points. It is difficult to assess the clinical meaningfulness of this increase since that requires further validation studies.

The effect of the PPS on behavior is a hypothesis that deserves further scrutiny. Intuitively speaking, instruction in an organized process of awareness of the psychological and psychosocial variables that influence an individual's actions would seem to have a potential effect on future actions. The PPS defines the relationship between behavior and internal mediating variables (emotions, thoughts, physiological reactions) and the relationship between behavior and consequences. It delineates certain intrapsychic variables that affect behavior, including the central role of fear and the notion of "taking a loss" in changing behavior. Future research needs to explore the relationship between the PPS and behavior change. Again, the short treatment period coupled with the early follow-up may not have been sufficient to demonstrate behavior changes that would eventually appear.

Characteristic Psychological Disturbance

Certain types of psychological disturbance are frequently observed in chronic pain patients, including hypochondriasis, hysterical patterns, depression, and anxious ruminative tendencies (Sternbach, 1974). Changes in these types of disturbances, as measured by four scales of the MMPI, Hs, D, Hy, and Pt, were not found to be significantly different between groups from pretreatment to follow-up. The Hs scale measures neurotic concern with bodily functions and tendency to somaticize problems. High scores indicate pessimism and show low levels of insight. Since the Hs scale reflects a stable character trait which is not thought to be easily subject to change, the personal skills taught in the PPS might not be expected to affect it. Nevertheless, the PPS group exhibited a mean gain score decrease of -5.42 (from a *T*-score of 78.37 to 72.95), while the control group decreased only -1.08 (from a *T*-

score of 72.13 to 71.05). However, the small sample size weakened the statistical test of any real difference that may have existed.

The D scale, a mood indicator, provides an index of current satisfaction with life. High scorers are depressed, dysphoric, guilty, and exhibit poor self-confidence. Changes between groups in scale elevation from pretreatment to follow-up were not significantly different. It is reasonable to hypothesize that patients may experience more control over their internal environment, therefore alleviating depressive feelings, through training in the PPS model. Assisting a chronic pain patient in understanding the relationships between stressful events, internal reactions, behavior, and consequences would seem likely to benefit these patients. Once an awareness of these relationships occurs, patients can learn to change and manipulate the relationships between these phenomena and enjoy greater satisfaction with life even though still experiencing chronic pain. Since depression for these patients often is of a long-term nature, a habitual response to the cycle of chronic pain, this type of depression is much more difficult to alleviate (Roy & Tunks, 1982).

The difference between the two groups on the mean gain scores on the Hy scale was not found to be significant. The Hy scale measures two features: denial of psychological problems and denial of social anxiety. High scorers somaticize problems, are immature, and demand much affection and attention. In a study of two groups of chronic pain patients receiving psychological treatment, one group received surgery for pain relief and another did not (Sternbach & Timmermans, 1975).

Results showed that the group which received surgery with resulting pain reduction significantly decreased scores on Hy, while the other group showed no change. The personality features indicated by an elevated Hy scale may be subject to change only following significant pain relief, despite any psychological treatment that is provided.

On the Pt scale, a measure of anxiety and an overall indicator of psychological turmoil, the PPS group demonstrated a mean gain score reduction of -5.82 points (from 72.74 to 66.93) and the Discussion group a mean reduction of -3.84 (from 60.04 to 56.20), a nonsignificant difference. The PPS reduction in this scale seems clinically significant even though it is not statistically significant. Simply participating in pain clinic treatments could have a reassuring effect on patients, showing them that others share their predicament in coping with pain. Further effects from training, notably an increased sense of perceived control, could affect anxiety and internal turmoil. A more intensive training period in the PPS might result in larger reductions on the Pt scale, toward a more "normal" elevation.

Examination of the mean pretreatment MMPI profiles (Table 4.14) reveals that the PPS group appeared to be more psychologically disturbed than the Discussion group. These pretreatment differences are difficult to account for since groups were randomly assigned to each condition. The PPS group showed more variation on almost all of the dependent variables than did the Discussion group. This greater variation increased the standard error and thus made statistical significance more difficult to achieve. The use of gain scores increased the precision of the experiment and controlled for these pretreatment differences.

In general, "personality" changes as measured by the MMPI may be difficult to achieve without accompanying reductions in chronic pain. There is support for the idea that neuroticism is the result of chronic pain and that neuroticism will be reduced when the pain is alleviated (Sternbach, 1974; Sternbach & Timmermans, 1975).

The Process of the Personal Paradigm Shift

Unlike other behavior change programs (Glasgow & Rosen, 1978, 1979; D'Zurilla & Goldfried, 1971), the PPS explores the intrapsychic mediating variables influencing the behavioral choice process and is directly applicable to health care management (Hinds, 1983). Patients are taught why change is so difficult and how resistance must be overcome before changes can be made. The emotion of fear plays a central role in this resistance to change. Skills to assist the individual in remaining motivated to make changes are developed, a feature often overlooked in other behavior change programs. In this section, a discussion of patients' process reactions to the PPS is presented.

One difficulty encountered was maintaining the patient's concentration on one "stress theme," or personal problem, throughout the PPS process. The tendency of some patients to become tangential may, in itself, be an indication of poor problem-solving skills. This may reflect the concentration difficulties that result from having chronic pain. A further explanation of the difficulty in remaining focused on

c
f

t
p
I
c
l
s

p
f
d
c
M

co
ha
(

"l
pa
to
lo
st

one problem may be that this behavior is a resistance to examining the internal environment, which is perceived as threatening.

Successful completion of "Step 1: A Personal Theme" is crucial to the patient's engagement in the PPS process. Some patients exhibited a poor ability to formulate a problem in specific, behavioral terms. Instead, they were excessively global and vague in their problem definitions. Some projected responsibility onto other people in their lives for "causing" their problem, making completion of the following steps nearly impossible.

In the step that requires awareness of internal reactions, some patients struggled with the task of identifying the "beliefs" that influence behavior in a stressful situation. Perhaps this exercise demands an extended process of introspection and a certain level of cognition not typically characteristic of this group of patients. More guidance in this important step may be necessary.

A clear understanding of the relationship between behavior and consequences requires emphasis by the instructor. Patients seemed to have more difficulty identifying those consequences that are internal (feelings) rather than external.

Perhaps the most significant step in Stage 1 is identifying a "loss" the patient must take in making a behavior change. Many patients needed to give more thought to this step before they were able to write their response because they were uncertain about the specific loss involved in working on their problem. The task presented in this step requires an awareness of intrapsychic processes that may not be at a conscious level for many patients, thus requiring assistance from the trainer.

Many comments were made about the value of constructing the "balance sheet" in Stage 2, Decision Making. A visual confrontation of the rewards and punishments for deciding to make or not to make a change was helpful. An important connection for patients to make is the link between making a commitment to change and confronting the fear to change. Here again, fears are often not conscious to the individual, requiring assistance from the trainer.

Patients often expressed satisfaction with the completion of the first two stages of the PPS, commenting that these stages were beneficial in and of themselves. This observation suggests that awareness of the components of a problem alone may be sufficient for change or resolution, a view previously made by Williams and Long (1975).

Stage 3, Charting Oppositional Alternatives, proved to be the most difficult stage for patients to complete. It is possible that patients who are bound by a "pain" perspective of themselves and the world are unable to generate alternative ways of thinking, feeling, and behaving without considerable difficulty (Melzack & Wall, 1982; Sternbach, 1982). Although it was clear that some patients had trouble with this stage, it appears that there is value in understanding the concept of "oppositional alternatives" even if personal examples are not currently available.

Stage 4, Charting Planning and Action, was experienced by patients as the easiest to complete. The steps in this stage elicited considerable discussion, particularly the step of identifying external support systems and reinforcement for self-change. Most patients appeared to benefit from this exercise despite difficulties with previous steps.

Limitations of the Study

A number of factors may account for the absence of statistically significant findings. These include small sample size, inappropriate dependent measures, the phenomenon of improvement in both groups, brief treatment period, rejection of the rehabilitation model of treatment, and pretreatment differences between groups. Each of these factors is discussed here with implications for the use of psychoeducational interventions with psychologically disturbed populations.

The small sample size was a clear methodological limitation. Since the group was the unit of analysis because individual subjects were not independent of one another, analyses were based on only 11 degrees of freedom, limiting the power of the statistical tests to detect small gains. The treatment would have to exert a powerful influence on patients to obtain significant results with this sample size.

It is possible that the dependent measures employed in the study, the MPQ, the MMPI, and the Lifestyle Coping Inventory, were inappropriate, and other measures more suitable to the effect of the PPS on this sample might be selected. The nature of the effect of the PPS on chronic pain patients is not yet well established, so constructs different from those investigated in this study need to be identified and researched. The question is whether the PPS influences the affective, cognitive, perceptual, or behavioral realm of functioning. One means of exploring this question would be to examine the experience of pain patients as they progress through the stages, listening to their reactions to the concepts presented. Two constructs that may be influenced by the PPS are sense of coherence (Antonovsky, 1980) and self-efficacy (Bandura, 1977). Sense of coherence is defined as a global orientation which expresses the extent to which one has a pervasive and enduring, though dynamic, feeling of confidence that one's internal and external environments are predictable. Bandura (1977) theorized that an important process in behavior change is the degree to which persons acquire the expectancy that they will be able to perform the new or goal behaviors toward which the change procedures are oriented. Intuitively, it appears that the PPS would influence both of these concepts.

Both groups in the study demonstrated improvement on several of the dependent measures. This phenomenon made it difficult to obtain statistical significance and conclude that one treatment results in greater gains than the other. Although the experimenter assumed only a role of discussion moderator, and the groups did not have a formal agenda, some control groups developed a surprising degree of cohesiveness. Group members shared important thoughts and feelings, and some members seemed to experience the healing effects of being with others who shared their problems. The intention of the discussion group treatment was simply to control for the factor of group participation in the study. Patients seemed to experience more benefit than initially expected from the group process, which often consisted only of sharing common symptoms because a more therapeutic exploration of feelings was avoided by the trainer.

The time available to administer treatment in the clinic setting was brief, a factor that may have contributed to the lack of measurable effectiveness of the PPS condition. While most behavior change manuals consist of four or five steps, the PPS comprises 24 steps, a complex intervention demanding concentration, persistence, and motivation from participants. Group members who experienced difficulty comprehending the concepts early in the process may have remained confused throughout because there was insufficient time for clarification and discussion. The short duration of treatment might not have permitted internalization of the behavior change model in the PPS.

A characteristic noted in certain subjects was the inability or unwillingness to view themselves and their treatment from the perspective of the rehabilitation model. A number of patients held firmly to the illness model in stating what they needed and wanted from clinic staff and where responsibility in their own treatment lay. These subjects expected that the medical system should "cure" them of pain, viewing themselves as passive participants in treatment. Employing the PPS intervention encouraged patients to discard the illness view and assume a rehabilitation perspective of their reaction to their pain. Active involvement in and benefit from the PPS are antithetical to acceptance of the illness model.

Pretreatment differences between the PPS and Discussion groups on the MMPI profiles affected nonsignificant outcomes. PPS groups showed greater elevations than Discussion groups on several scales, indicating that these groups were comprised of more psychologically disturbed individuals. Therefore, there was considerable within-groups variation, making it difficult to detect small changes between the PPS and Discussion groups. An examination of the *F*-values obtained from the ANOVA values revealed few values greater than 1.0, indicating that within-groups variation was nearly as large as between-groups variation. These large within-groups differences may be more effectively controlled by performing an analysis using group size as a covariate in future studies of this kind.

Results of this study have implications for the theory of psychoeducation (Larson, 1984) and, therefore, the optimal use of the PPS with chronic pain patients. The question becomes: When is psychoeducation appropriate, and when do patients require something different, such as psychotherapy? Lazarus and Folkman (1984) spoke of the "trivialization of distress" among some practitioners. This phenomenon occurs when the existential distress that some patients experience is ignored and the assumption is made that patients only require knowledge to get better. Chronic pain patients are typically quite psychologically disturbed individuals, as noted by close examination of the MMPI profiles in Appendix I. Perhaps the very obstacle that has led to their coping deficiency in the first place is the obstacle that will obstruct the success of the psychoeducational intervention. Some chronic pain patients who have internalized a rehabilitation perspective seem to require only more knowledge to fill the gaps and improve coping ability. Others whose coping failure is not due to an uncomplicated lack of knowledge may require intensive psychotherapeutic treatment before using a psychoeducational model like the PPS.

Implications for Further Research

The results of this study document the need for further exploration of the psychoeducational intervention PPS as an adjunct procedure in the treatment of the chronic pain patient. As an initial experimental investigation of the PPS, this research addressed the effectiveness of educating chronic pain patients in managing the psychological and psychosocial factors that affect pain and health. Several implications of this research are now presented.

Refinements in the PPS manual for use with a chronic pain population are encouraged. The goal of these alterations should be to simplify the text and improve the level of comprehension. To this end, the use of more diverse examples of "stress themes" or personal problems would be beneficial. The language of the program should be more "pictorial," concrete, and free from jargon that might confuse, thus better tailored to the level of psychological sophistication of the patients. The longer, more difficult steps should be condensed, without sacrificing the meaning of the concepts.

Perhaps introductory notes regarding the optimal duration of the training period would assist trainers in preparing to teach the program. A more realistic time period to instruct pain patients is

2 weeks, meeting four or five times each for 2-hour sessions. The added length could optimally be used to clarify concepts and provide more individualized attention.

A final note concerning use of the PPS manual is to recommend that the trainer choose a personal stress theme and complete the PPS before instructing others. There is a value to be gained from personal experience and familiarity with application of the concepts that may not be acquired through an impersonal perusal of the program. The PPS intervention becomes training not only for the patients but also for the trainer.

The question as to the use of individuals or groups in the research analysis merits further consideration. Since research with PPS is in the initial stages, studies employing either unit of analysis would serve different purposes, yet both could provide useful information. Both studies using groups and studies using individual subjects could help determine the most effective means for delivery of the intervention.

Descriptive "case" studies detailing the experience of single pain patients with the PPS would assist in identifying patterns in the way patients struggle with personal change. Identification of points in the program where pain patients may psychologically withdraw or resist would be helpful to the trainer in anticipating problems of motivation and fear of change. A more complete understanding of the effect that chronic pain has on the psychological health and problem-solving abilities of these patients would be a valuable contribution to rehabilitation efforts.

Refinements in the PPS manual would enhance ease of administration in group settings. Conducting treatment over a longer period and increasing the number of groups would have increased the power of the present study. Use of same-size groups would control for some of the within-group differences that were evident in the present study. The use of the group setting is attractive for two reasons: first, curative factors present in any group seem to enhance attraction to the task, and second, teaching the PPS in group settings is in keeping with the mission of counseling psychology, to train large numbers of individuals in personal and interpersonal skills.

Further research might examine the effectiveness of training pain patient groups in the PPS versus training in one of the other popular behavior change programs, such as the program developed by Goldfried and Goldfried (1975) or Watson and Tharp (1977). This type of study could explore the added benefit of the lengthier PPS program and its inclusion of several concepts not found in these other programs. Again, a much larger sample size would be necessary in such a study to increase power and the possibility of achieving statistical significance.

Exploration of more appropriate dependent measures to employ in determining the effect of the PPS on chronic pain patients is indicated. The guiding question is: Does the PPS influence the cognitive, affective, or behavioral realm of experience, and how is this influence most optimally measured? It would be worthwhile to investigate effects on an individual's cognitive framework or view of the world. Does the PPS have an effect on locus of control, ego strength, self-efficacy, or certain attitudinal variables? These are questions that were not answered in the present research and require further study.

To more adequately address the maintenance hypothesis, a longer follow-up time would be needed, a study that may be beyond the realm of the doctoral dissertation. The ability to determine a regression effect for the control groups in this research would be improved if dependent measures were gathered 9 to 12 months following termination of treatment. Within this time frame, patients would have more fully returned to their living environments, and internalization of PPS concepts could be better determined.

Finally, efforts to continue to integrate the educational model into the health care system and to encourage patients to assume greater responsibility for their rehabilitation are encouraged. Psychoeducation would seem to have potential benefit in helping to decrease health care costs. This study was one attempt to explore the utility of psychoeducation for a health care population.

APPENDICES

APPENDIX A

ESTIMATED WAIS-IQ VALUES USING SHIPLEY INSTITUTE OF LIVING SCORES FOR EXPERIMENTAL AND CONTROL GROUPS

Estimated WAIS-IQ Values Using Shipley Institute of Living Scores for Experimental and Control Groups

Group	Total Shipley Score	Estimated WAIS-IQ
Experimental		
1	62.50	121.00
2	51.60	105.80
3	46.60	102.80
4	39.75	96.75
5	35.00	89.50
6	60.00	111.40
Grand mean	50.91	104.54
Control		
1	33.60	92.00
2	41.00	98.00
3	41.50	97.17
4	49.00	103.50
5	46.20	102.60
6	42.26	99.20
Grand mean	42.47	98.42

Note: Shipley total raw scores computed by adding Verbal subtest raw score and Abstraction subtest raw score. Total scores were then converted to estimated WAIS-IQs using age-level tables in Paulson and Lin (1970).

APPENDIX B

FOLLOW-UP QUESTIONNAIRE

FOLLOW-UP QUESTIONNAIRE

1. When did your pain begin? Year:_____ Month:_____

2. How many surgeries have you had for your pain? (check one)

   None____ One____ Two____ Three or more____

3. Which <u>one</u> word describes your pain <u>right now</u>? (circle the word)

   None Mild Discomforting Distressing Horrible or Excruciating

4. Which <u>one</u> word described your pain when you first entered the Pain Clinic? (circle the word)

   None Mild Discomforting Distressing Horrible or Excruciating

5. Since you were a patient at the Pain Clinic, what treatments have you tried to relieve your pain? (check the line or lines)

   ___ None
   ___ Bed rest
   ___ Physical therapy
   ___ Traction
   ___ Chiropractor
   ___ Postural exercises
   ___ Brace or cast
   ___ Injections
   ___ Drugs
   ___ Surgery
   ___ Other

6. <u>Right now</u>, as compared to before you entered the Pain Clinic, are you: (check <u>only</u> one below)

   ____ Taking <u>less</u> medication for pain
   ____ Taking <u>no</u> medication for pain
   ____ Taking <u>more</u> medication for pain
   ____ No change between now and then in medication for pain

7. Since you were in the Pain Clinic three months ago, have you been hospitalized for your pain? Yes____ No____

8. <u>Right now</u>, are you receiving any income for your pain?

   Yes___ No___ If yes, from whom? Workman's Compensation____
   Pension____ Insurance____

9. Before you entered the Pain Clinic, were you receiving any income for your pain? Yes___ No___ If yes, from whom?

   Workman's Compensation____ Pension____ Insurance____

10. Does your pain currently interfere with sexual intercourse?

    Yes____ No_____

11. Are you currently working at a job? Yes___ No___

    If yes, are you working full time?____ Part time?____
    Job training_____

12. Estimate the extent of your pain relief due to your Pain Clinic stay: (check only one)

    ____ Complete pain relief
    ____ Very good pain relief
    ____ Good pain relief
    ____ Fairly good pain relief
    ____ None or slight pain relief

APPENDIX C

McGILL PAIN QUESTIONNAIRE

WHAT KIND OF PAIN DO YOU HAVE?

PICK THE ONE BEST WORD ON EACH LINE TO DESCRIBE YOUR PAIN. IF NO WORDS APPLY, MARK "NONE." BE SURE TO MARK EVERY LINE.

SCALE 1	none	flickering	quivering	pulsing	throbbing	beating	pounding
SCALE 2	none	jumping	flashing	shooting			
SCALE 3	none	pricking	boring	drilling	stabbing	lancinating	
SCALE 4	none	sharp	cutting	lacerating			
SCALE 5	none	pinching	pressing	gnawing	cramping	crushing	
SCALE 6	none	tugging	pulling	wrenching			
SCALE 7	none	hot	burning	scalding	searing		
SCALE 8	none	tingling	itchy	smarting	stinging		
SCALE 9	none	dull	sore	hurting	aching	heavy	
SCALE 10	none	tender	taut	rasping	splitting		

Pain rating index-sensitivity (PRI-S). Ten categories of qualitative words used to self-report the sensory component of pain.

WHAT KIND OF PAIN DO YOU HAVE?

PICK THE ONE BEST WORD ON EACH LINE TO DESCRIBE YOUR PAIN. IF NO WORDS APPLY, MARK "NONE." BE SURE TO MARK EVERY LINE.

SCALE 11
none tiring exhausting

SCALE 12
none sickening suffocating

SCALE 13
none fearful frightful terrifying

SCALE 14
none punishing grueling cruel vicious killing

SCALE 15
none wretching blinding

SCALE 16
none annoying troublesome miserable intense unbearable

SCALE 17
none spreading radiating penetrating piercing

SCALE 18
none tight numb drawing squeezing tearing

SCALE 19
none cool cold freezing

SCALE 20
none nagging nauseating agonizing dreadful torturing

Pain rating index-affective/evaluative (PRI-AE). Ten categories of qualitative words used to self-report the affective-evaluative component of pain.

APPENDIX D

SHIPLEY INSTITUTE OF LIVING SCALE

NAME____

In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. Draw a line under the one word which means the same thing, or most nearly the same thing, as the first word. A sample has been worked out for you. If you don't know, guess. Be sure to underline the one word in each line that means the same thing as the first word.

SAMPLE

	LARGE	red	big	silent	wet

BEGIN HERE

(1)	TALK	draw	eat	speak	sleep
(2)	PERMIT	allow	sew	cut	drive
(3)	PARDON	forgive	pound	divide	tell
(4)	COUCH	pin	eraser	sofa	glass
(5)	REMEMBER	swim	recall	number	defy
(6)	TUMBLE	drink	dress	fall	think
(7)	HIDEOUS	silvery	tilted	young	dreadful
(8)	CORDIAL	swift	muddy	leafy	hearty
(9)	EVIDENT	green	obvious	sceptical	afraid
(10)	IMPOSTOR	conductor	officer	book	pretender
(11)	MERIT	deserve	distrust	fight	separate
(12)	FASCINATE	welcome	fix	stir	enchant
(13)	INDICATE	defy	excite	signify	bicker
(14)	IGNORANT	red	sharp	uninformed	precise
(15)	FORTIFY	submerge	strengthen	vent	deaden
(16)	RENOWN	length	head	fame	loyalty
(17)	NARRATE	yield	buy	associate	tell
(18)	MASSIVE	bright	large	speedy	low
(19)	HILARITY	laughter	speed	grace	malice
(20)	SMIRCHED	stolen	pointed	remade	soiled
(21)	SQUANDER	tease	belittle	cut	waste
(22)	CAPTION	drum	ballast	heading	ape
(23)	FACILITATE	help	turn	strip	bewilder
(24)	JOCOSE	humorous	paltry	fervid	plain
(25)	APPRISE	reduce	strew	inform	delight
(26)	RUE	eat	lament	dominate	cure
(27)	DENIZEN	senator	inhabitant	fish	atom
(28)	DIVEST	dispossess	intrude	rally	pledge
(29)	AMULET	charm	orphan	dingo	pond
(30)	INEXORABLE	untidy	involatile	rigid	sparse
(31)	SERRATED	dried	notched	armed	blunt
(32)	LISSOM	moldy	loose	supple	convex
(33)	MOLLIFY	mitigate	direct	pertain	abuse
(34)	PLAGIARIZE	appropriate	intend	revoke	maintain
(35)	ORIFICE	brush	hole	building	lute
(36)	QUERULOUS	maniacal	curious	devout	complaining
(37)	PARIAH	outcast	priest	lentil	locker
(38)	ABET	waken	ensue	incite	placate
(39)	TEMERITY	rashness	timidity	desire	kindness
(40)	PRISTINE	vain	sound	first	level

Form 2713

NAME____

Complete the following. Each dash (—) calls for either a number or a letter to be filled in. Every line is a separate item. Take the items in order, but don't spend too much time on any one.

START HERE

(1) 1 2 3 4 5 __

(2) white black short long down __ __

(3) AB BC CD D__

(4) Z Y X W V U __

(5) 1 2 3 2 1 2 3 4 3 2 3 4 5 4 3 4 5 6 __ __

(6) NE/SW SE/NW E/W N/__

(7) escape scape cape __ __ __ __

(8) oh ho rat tar mood __ __ __ __

(9) A Z B Y C X D __

(10) tot tot bard drab 537 __ __ __

(11) mist is wasp as pint in tone __ __

(12) 57326 73265 32657 26573 __ __ __ __ __

(13) knit in spud up both to stay __ __

(14) Scotland landscape scapegoat __ __ __ __ __ee

(15) surgeon 1234567 snore 17635 rogue __ __ __ __ __

(16) tam tan rib rid rat raw hip __ __

(17) tar pitch throw saloon bar rod fee tip end plank meals

(18) 3124 82 73 154 46 13__

(19) lag leg pen pin big bog rob __ __

(20) two w four r one o three __

Form 2713

APPENDIX E

LIFESTYLE COPING INVENTORY

LIFESTYLE COPING INVENTORY

by
William C. Hinds
Professor, Counseling
Psychology Program
437 Erickson Hall
Michigan State University

Mark each statement as a weekly average if it applies to your actions.

Almost Always
Often
Occasionally
Rarely
Never

1. I keep my living environment quiet. A B C D E

2. I eat two servings of vegetables daily. A B C D E

3. I follow my own values, rather than go out of my way to make sure people like me. A B C D E

4. I let others make choices rather than try and manipulate them to meet my needs. A B C D E

5. I let other people know when I'm sick. A B C D E

6. I avoid salting my food at the table. A B C D E

7. I provide myself with small and constant self rewards to keep me motivated. A B C D E

8. I express my feelings of anger. A B C D E

9. I avoid shoulds and should nots in my self-statements. A B C D E

10. I engage in an active sport, e.g. racquetball, swimming, touch football, tennis, etc. at least once a week. A B C D E

11. I avoid eating meat and instead substitute fish and poultry. A B C D E

12. I let others win sometimes, rather than try to win in most situations. A B C D E

13. I balance work and play, rather than pay a high price for success. A B C D E

14. I drive at the speed limit. A B C D E

15. I build in self-improvement actions in my lifestyle. A B C D E

16. I keep my weight within ten pounds of what I consider my ideal weight. A B C D E

17. I have brown rice rather than white rice. A B C D E

Health Promotion - Stress Reduction

Behavioral Coping Inventory by William C. Hinds

This inventory is designed to help you understand your health promotion - stress reduction actions. The following pages cover various lifestyle, nutritional, drug, exercise, environmental, problem solving and psychosocial habits that affect your health and stress levels. Your answers can provide you with valuable feedback when compared with others who have taken this instrument. Please answer each item honestly as possible. Your health promotion - stress reduction intervention strategies depend on self-generated accurate feedback.

Directions:

1) With this inventory, you should have a special answer sheet on which to mark your answers.

2) Please make no marks on this booklet; it will be used again by other people.

3) Use any soft, black, lead pencil (such as a No. 2) to make your mark on the answer sheet.

4) Fill in your name and other information on the answer sheet. Follow carefully the instructions for filling in your name.

5) Make a heavy, dark mark for each answer - not a cross or a check mark.

6) If you make a mistake or change your mind, erase carefully and thoroughly.

7) Mark on your answer sheet one of five possible choices.

Choice A = Never (0% of the Time)
Choice B = Rarely (0-25% of the Time)
Choice C = Occasionally (25% - 50% of the Time)
Choice D = Often (50% - 75% of the Time)
Choice E = Very Often (75% - 100% of the Time)

Example: Question One. I eat two servings of vegetables daily.
Answer: Choice B - 25% of the Time.

	A	B	C	D	E
Question One		X			

Please turn the page and begin.

18. I make sure to include fiber in my diet. A B C D E

19. I choose environments which have an artistic or esthetic value. A B C D E

20. I relax and get interested, rather than get angry with people who are slower than me. A B C D E

21. I seek out others at work or in the neighborhood. A B C D E

22. I avoid sugar and sweets (cookies, cakes, ice cream). A B C D E

23. I practice some form of relaxation at least fifteen minutes a day, e.g. progressive relaxation, yoga, biofeedback, meditation, imagery exercises or deep breathing exercises. A B C D E

24. I avoid drinking or eating alot before going to bed. A B C D E

25. I avoid making generalizations about myself, e.g. I'm dumb, ugly, a failure, etc. A B C D E

26. I engage in activities that give me a sense of competency, e.g. hobby, pastime, avocation, etc. A B C D E

27. I visit or talk to a good friend. A B C D E

28. I keep my living environment clean. A B C D E

29. I avoid the use of tobacco. A B C D E

30. I make my own decisions, even though some people might not like them. A B C D E

31. I set my own standards, rather than worry about other's standards for me. A B C D E

32. I take advice from others. A B C D E

33. I share my experiences with other people. A B C D E

34. I get out and talk with groups of people. A B C D E

35. I engage in thoughts that relax my body. A B C D E

36. I wear seat belts when I drive. A B C D E

37. I use thought stopping strategies to avoid obsessing over events with no control. A B C D E

38. I stick up for my own rights. A B C D E

39. I invite people over to my place for drinks or a meal. A B C D E

40. When waiting in lines, I amuse myself, rather than get angry. A B C D E

41. I avoid taking more than two alcoholic drinks a day. A B C D E

42. I seek feedback on my actions. A B C D E

43. I get my teeth cleaned twice a year. A B C D E

44. I eat whole bread instead of white bread. A B C D E

45. I use pepper and herbs to season my food instead of salt. A B C D E

46. I walk when possible rather than ride in an automobile. A B C D E

47. I let others express what they are feeling. A B C D E

48. I drink only two cups or less of tea or coffee with caffeine a day. A B C D E

49. I let myself be dependent, rather than appear tough and strong most of the time. A B C D E

50. I accept that people are interested in what I say. A B C D E

51. I seek out others, rather than feel neglected or rejected. A B C D E

52. I accept my worthiness as a person, and express it to other people. A B C D E

53. I go out of my way to talk to strangers. A B C D E

54. I do activities with a social group. A B C D E

55. My living environment is convenient, e.g. meals, laundry services, telephone, etc. A B C D E

56. I substitute low calorie drinks for high calorie drinks. A B C D E

57. I engage in resistance exercise to tone and strengthen my muscles. For example: weights or isometric exercise. A B C D E

58. I express and share with others a wide range of emotions, e.g. anger, distress, fear, shame. A B C D E

59. I avoid perfectionistic self-standards. A B C D E

60. I let myself cry. A B C D E

61. I seek out experiences where I have to be alone. A B C D E

62. I'm outgoing in new situations. A B C D E

63. I trust others, rather than acting like the world is full of hostile people. A B C D E

64. I use positive imagination to approach fearful events. A B C D E

65. I avoid worrying about consequences which I can not predict. A B C D E

66. I avoid saving up (inhibiting) my feelings, e.g. anger, distress, etc. A B C D E

67. I avoid personalizing things I can't control. A B C D E

68. When I get into a stressed state, I take a break. A B C D E

69. I make sure I get an adequate amount of sleep. A B C D E

70. I avoid high-sodium foods. A B C D E

71. I eat two servings of fruit daily. A B C D E

72. I climb stairs rather than ride an elevator. A B C D E

73. I avoid comparing myself to other people, and instead set self-standards for improvements. A B C D E

74. I use visualization to relax my body. A B C D E

75. I choose environments free of air pollution. A B C D E

76. I relax rather than try to lead in most situations. A B C D E

77. I share my emotions with other people. A B C D E

78. I make demands on others, even though it may not make me popular with them. A B C D E

79. I do things just for the enjoyment of doing them, even if I have to "waste" some time. A B C D E

80. I choose environments that are relaxing. A B C D E

81. I get together with my co-workers. A B C D E

82. I go to the park or visit a pleasant environment. A B C D E

83. I label what I'm feeling. A B C D E

84. I set modest action standards for myself so I can meet my goals. A B C D E

85. I engage in active physical work, e.g. washing the car, housework, chopping wood, at least twice a week. A B C D E

86. I get physical exams at least once a year, e.g. heart, pap smear, breast exam, prostate gland, etc. A B C D E

87. I avoid processed foods, and instead eat fresh foods. A B C D E

88. I eat foods that are steamed, baked or boiled instead of pan fried or french fried. A B C D E

89. When I'm suffering from an illness or injury, I take time to restore my physical self. A B C D E

90. I share my feelings with others. A B C D E

91. I spontaneously express my feelings. A B C D E

92. Once I have decided on an action, I do not spend time worrying about whether people are going to criticize me. A B C D E

93. I get away for a relaxing weekend or vacation twice a year. A B C D E

94. I relax during meals and don't discuss business or stressful subjects. A B C D E

95. I eat low fat snacks. A B C D E

96. I choose environments with little noise pollution. A B C D E

97. I use polyunsaturated margarine instead of butter. A B C D E

98. I floss my teeth once a day. A B C D E

99. I let myself experience the distress of loss. A B C D E

100. I avoid making negative interpretations about events in my life. A B C D E

101. I try to understand the beliefs that motivate me. A B C D E

102. I listen to others, rather than arguing for my point of view most of the time. A B C D E

103. I get involved in group activities. A B C D E

104. I think about my strengths and skills, rather than worry about being weak and helpless. A B C D E

105. I say twice as many positive statements to myself as negative. A B C D E

106. I avoid justifying my actions and mistakes to myself and others. A B C D E

107. I walk a half an hour a day at one time. A B C D E

108. I get together with a community group. A B C D E

109. My living environment is organized. A B C D E

110. I read labels on foods and beverages so I know about their nutritional contents. A B C D E

111. I spend twenty minutes three times a week engaged in aerobic exercise, e.g. jogging, cycling, swimming, rebounding, etc. A B C D E

112. I avoid dwelling on the past. A B C D E

113. I accept the fact that others will not like me. A B C D E

114. I confront people, rather than worrying about others approving of me. A B C D E

115. I laugh and feel joyful. A B C D E

116. I cognitively reward myself for accomplishing tasks. A B C D E

117. I avoid making negative statements about others. A B C D E

118. I engage in stretching or limbering exercises once a day. A B C D E

119. I eat low fat cheese instead of high fat cheese. A B C D E

120. I take time to play. A B C D E

121. I drink beverages that contain little sugar. A B C D E

122. I think of the future with positive expectations. A B C D E

123. I avoid thinking in terms of obsolutes, e.g. rights and wrongs, good and bad. A B C D E

124. I am assertive in a wide variety of situations. A B C D E

125. I face conflicts head on, rather than avoid frictions and difficulties. A B C D E

126. I take a break, rather than try to hurry. A B C D E

127. I'll let things sit, rather than try to do more than three things at once. A B C D E

128. I admit my mistakes to others. A B C D E

129. I get together with a political action group. A B C D E

130. I make an effort to be around friends and associates. A B C D E

131. I get involved in friendships with many people. A B C D E

132. I try and keep close relationships. A B C D E

133. I avoid buying processed foods that are highly salted. A B C D E

134. I accept my limitations and do not become discouraged when other people do things well. A B C D E

135. I avoid eating more then three eggs a week. A B C D E

136. I get together with a religious group. A B C D E

List any other strategies you use to promote your own health.

137. ____ A B C D E

138. ____ A B C D E

139. ____ A B C D E

List your top three strategies for the relief of stress.

140. ____ A B C D E

141. ____ A B C D E

142. ____ A B C D E

APPENDIX F

INFORMED CONSENT FORM

INFORMED CONSENT FORM

I understand that the purpose of my participation in this study is to investigate the effects of an educational treatment on the way people view their pain and the kinds of decisions people make about their health care. I understand that by participating in this study I will be assigned to one of two groups: (1) a group that learns personal problem solving or (2) a group that participates in discussion about stress and pain.

I will be identified by code number only and not by name. I understand that for all information recorded, my confidentiality will be strictly maintained.

I understand that by my participation, I will be asked to complete several paper-and-pencil inventories about my pain, my health habits, and my personality. I understand that I will complete these inventories at three different times: (1) at the beginning of the week before my treatments, (2) at the end of the week after my treatments, and (3) three months following my discharge from the pain clinic. I understand that I will be mailed the inventories three months after I am discharged and I am to complete these inventories and mail them back to the investigator in the self-addressed envelope provided. By my signature, I agree to complete these inventories to the best of my ability.

The details of this study have been explained to me and my questions answered to my satisfaction. I participate in this study freely, trusting that new knowledge may be obtained which may be of value to me and to others who have pain.

I understand that there is no guarantee that my participation in this study will result in benefit to me. I understand that whether or not I agree to participate in this study I will receive the usual pain clinic treatments. I am free to discontinue my participation totally. Finally, I understand that I may request a summary of the results of this study, and those results will be mailed to me.

Signature of Participant________________________
Date____________________

Signature of Researcher________________________
Date____________________

REFERENCES

REFERENCES

Anderson, T. P., Cole, T. M., Gullickson, G., Hudgens, A., & Roberts, A. H. (1977). Behavior modification of chronic pain: A treatment program by a multidisciplinary team. *Clinical Orthopedics*, *129*, 96-100.

Antonovsky, A. (1980). *Health, stress, and coping*. San Francisco: Jossey-Bass.

Aronoff, G. M., Evans, W. D., & Enders, P. L. (1983). A review of follow-up studies of multidisciplinary pain units. *Pain*, *16*, 1-11.

Authier, J., Gustafson, K., Guerney, B., & Kasdorf, J. (1975). The psychological practitioner as a teacher: A theoretical-historical and practical review. *The Counseling Psychologist*, *5*, 31-50.

Bandura, A. (1969). *Principles of behavior modification*. New York: Holt, Rinehart & Winston.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191-215.

Barrera, M., Jr., & Glasgow, R. E. (1976). Design and evaluation of a personalized instruction course in behavioral self-control. *Teaching of Psychology*, *3*, 81-83.

Bartz, W. R. (1968). Relationship of the WAIS, BETA, and Shipley-Hartford scores. *Psychological Reports*, *22*, 676.

Bartz, W. R., & Loy, D. L. (1970). The Shipley-Hartford as a brief IQ screening device. *Journal of Clinical Psychology*, *26*, 74-75.

Beck, A. (1976). *Cognitive therapy and the emotional disorders*. New York: Meridian.

Becker, M. H., & Maiman, L. A. (1975). Sociobehavioral determinants of compliance with health and medical care recommendations. *Medical Care*, *13*, 10-24.

Benfari, R., Eaken, E., & Stole, J. (1981). Behavioral intervention and compliance to treatment regimes. *Annual Review of Public Health*, *2*, 431-471.

Bolyard, R. L. (1982). The use of the sensory and affective pain rating indexes of the McGill Pain Questionnaire in the assessment of chronic pain patients (Doctoral dissertation, University of Chicago, 1982). Dissertation Abstracts International, 43, 863B-864B.

Brehm, J. W. (1966). A theory of psychological reactance. New York: Academic.

Brown, G. I. (1971). Human teaching for human learning: An introduction to confluent education. New York: The Viking Press.

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research. Boston: Houghton-Mifflin Co.

Carkhuff, R. R. (1973). The art of problem-solving: A guide for developing problem-solving skills for parents, teachers, counselors, and administrators. Amherst, MA: Human Resource Development Press.

Chapman, S. L., Brena, S. F., & Bradford, L. A. (1981). Treatment outcome in a chronic pain rehabilitation program. Pain, 11, 255-268.

Colley, S. (1975). Personal education. Personnel and Guidance Journal, 53, 610-6164.

Cottle, W. C. (1950). Card versus booklet forms of the MMPI. Journal of Applied Psychology, 34, 255-259.

Coyne, J. C., & Holroyd, K. (1982). Stress, coping, and illness: A transactional perspective. In T. Millon, C. Green, & R. Meagher (Eds.), Handbook of clinical health psychology (pp. 103-128). New York: Plenum Press.

Cox, D. R. (1958). Planning of experiments. New York: Wiley.

Cronbach, L. J., & Furby, L. (1970). How should we measure "change"--Or should we? Psychological Bulletin, 74, 68-80.

Cudney, M. R. (1975). Eliminating self-defeating behaviors. Kalamazoo, MI: Life Giving Enterprises.

Dixon, D. N., Heppner, P. P., Petersen, C. H., & Ronning, R. (1979). Problem-solving workshop training. Journal of Counseling Psychology, 26, 133-139.

Dollard, J., & Miller, N. (1950). Personality and psychotherapy. New York: McGraw-Hill.

Drum, D. J., & Knott, J. E. (1977). *Structured groups for facilitating development*. New York: Human Sciences Press.

D'Zurilla, T., & Goldfried, M. (1971). Problem-solving and behavior modification. *Journal of Abnormal Psychology*, *78*, 107-126.

Egan, G. (1975). *The skilled helper: A model for systematic helping and interpersonal relating*. Monterey, CA: Brooks/Cole Publishing Co.

Feldt, L. S. (1958). A comparison of the precision of three experimental designs employing a concomitant variable. *Psychometrika*, *23*, 335-352.

Fordyce, W. E. (1976). *The treatment of chronic pain and illness*. St. Louis: The C. V. Mosby Co.

Fordyce, W., Fowler, R., Lehmann, J., DeLateur, B., Sand, P., & Treischmann, R. (1973). Operant conditioning in the treatment of chronic pain. *Archives of Physical Medicine and Rehabilitation*, *54*, 399-408.

Fry, E. (1968). Estimating readability level. *Journal of Reading*, *11*, 513-516.

Glasgow, R. E., & Rosen, G. M. (1978). Behavioral bibliotherapy: A review of self-help behavior therapy manuals. *Psychological Bulletin*, *85*, 1-23.

Glasgow, R. E., & Rosen, G. M. (1979). Self-help behavior therapy manuals: Recent developments and clinical usage. *Clinical Behavior Therapy Review*, *1*, 1-20.

Glass, G. V., & Stanley, J. C. (1970). *Statistical methods in education and psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Goldfried, M. R. (1980). Psychotherapy process: Current issues and future directions. In M. J. Mahoney (Ed.), *Psychotherapy as coping skills training* (pp. 115-133). New York: Plenum Press.

Goldfried, M. R., & Davison, G. D. (1976). *Clinical behavior therapy*. New York: Holt, Rinehart, & Winston.

Goldfried, M. R., & Goldfried, A. P. (1975). Cognitive change methods. In F. Kanfer & A. P. Goldstein (Eds.), *Helping people change* (pp. 154-175). New York: Pergamon Press.

Goldfried, M. R., & Merbaum, M. (Eds.). (1973). *Behavior change through self-control*. New York: Holt, Rinehart, & Winston.

Goldsmith, D. A. (1981). A multi-element psychological management program for chronic low back pain (Doctoral dissertation, North Texas State University, 1981). Dissertation Abstracts International, 41, 4261-B.

Goldstein, A. P. (1981). Psychological skill training: The structured learning technique. New York: Pergamon Press.

Guerney, B. G., Guerney, L., & Stollak, G. (1971/72). The potential advantages of changing from a medical to an educational model in practicing psychology. Interpersonal Development, 2, 238-245.

Guerney. B. G., Stollak, G., & Guerney, L. (1970). A format for a new mode of practice: Or how to escape a zombie. The Counseling Psychologist, 2, 97-104.

Guerney, B. G., Stollak, G., & Guerney, L. (1971). The practicing psychologist as educator--An alternative to the medical practitioner model. Professional Psychology, 2, 276-282.

Hathaway, S. R., & McKinley, J. C. (1940). A multiphasic personality schedule (Minnesota): I. Construction of the schedule. Journal of Psychology, 10, 249-254.

Hathaway, S. R., & McKinley, J. C. (1942). A multiphasic personality schedule (Minnesota): III. The measurement of symptomatic depression. Journal of Psychology, 14, 73-84.

Hathaway, S. R., & McKinley, J. C. (1967). The Minnesota Multiphasic Personality Inventory manual. New York: Psychological Corp.

Heppner, P. P. (1978). A review of the problem-solving literature and its relationship to the counseling process. Journal of Counseling Psychology, 25, 366-375.

Herzlich, C. (1973). Health and illness: A social-psychological analysis. New York: Academic Press.

Hinds, W. (1983). The Personal Paradigm Shift: A lifestyle intervention approach to health care management. Unpublished manuscript. East Lansing: Michigan State University.

Hobbs, N. (1964). Mental health's third revolution. American Journal of Orthopsychiatry, 34, 822-833.

Holroyd, K., Andrasik, F., & Westbrook, T. (1977). Cognitive control of tension headache. Cognitive Therapy Research, 1, 121-133.

Holzberg, J., & Alessi, D. (1949). Reliability of the shortened MMPI. Journal of Consulting Psychology, 13, 288-292.

Hopkins, K. D. (1982). The unit of analysis: Group means versus individual observations. *American Educational Research Journal*, *19*, 5-18.

Ivey, A., & Alschuler, A. (1973). An introduction to the field. *Personnel and Guidance Journal*, *51*, 591-597.

Jahoda, M. (1958). *Current concepts of positive mental health*. New York: Basic Books.

Kanfer, F. (1975). Self-management methods. In F. Kanfer & A. Goldstein (Eds.), *Helping people change: A textbook of methods* (pp. 94-114). New York: Pergamon Press.

Kanfer, F. (1977). The many faces of self-control, or behavior modification changes its focus. In R. Stuart (Ed.), *Behavioral self-management: Strategies, techniques, outcomes* (pp. 257-275). New York: Brunner/Mazel, 1977.

Keppel, G. (1973). *Design and analysis: A researcher's handbook*. Englewood Cliffs, NJ: Prentice-Hall.

Larson, D. (Ed.). (1984). *Teaching psychological skills: Models for giving psychology away*. Monterey, CA: Brooks/Cole.

Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Co.

Leavitt, F. (1979). Stressing life events with the experience of low back pain. *Journal of Psychosomatic Research*, *23*(1), 49-55.

Loeser, J. D. (1974). Dorsal rhizotomy: Indications and results. In J. J. Bonica (Ed.), *Advances in neurology: International symposium on pain* (Vol. 4, pp. 353-365). New York: Raven Press.

Lumsdaine, A. A. (1963). Instruments and media of instruction. In N. L. Gage (Ed.), *Handbook of research on teaching* (pp. 625-649). Chicago: Rand McNally.

Lutz, R., Silbert, M., & Olshan, N. (1983). Treatment outcomes and compliance with therapeutic regimens: Long-term follow-up of a multidisciplinary pain program. *Pain*, *17*, 301-308.

Mahoney, M. (1974). *Cognition and behavior modification*. Cambridge, MA: Ballinger Publishing Co.

Mahoney, M., & Thoreson, C. (1974). *Self-control: Power to the person*. Monterey, CA: Brooks/Cole Publishing Co.

McCreary, C., & Turner, J. (1979). Psychological disorder and pain description. *Health Psychology*, *2*, 1-10.

McCreary, C., Turner, J., & Dawson, E. (1981). Principal diversions of the pain experience and psychological disturbance in chronic low back pain patients. *Pain*, *11*, 85-92.

McGuire, M., & Sifneos, P. (1970). Problem-solving in psychotherapy. *Psychiatric Quarterly*, *44*, 667-673.

McKay, M., Davis, M., & Fanning, P. (1981). *Thoughts and feelings: The art of cognitive stress intervention*. Richmond, CA: New Harbinger Publications.

Meichenbaum, D. (1977). *Cognitive-behavior modification*. New York: Plenum Press.

Meichenbaum, D., & Turk, D. (1976). The cognitive-behavioral management of anxiety, anger, and pain. In P. Davidson (Ed.), *The behavioral management of anxiety, anger, and pain* (pp. 163-182). New York: Brunner/Mazel, 1976.

Melzack, R. (1973). *The puzzle of pain*. United Kingdom: Penguin Books.

Melzack, R. (1975). The McGill Pain Questionnaire: Major properties and scoring methods. *Pain*, *1*, 277-299.

Melzack, R., & Torgerson, W. (1971). On the language of pain. *Anesthesiology*, *50*, 1934-1941.

Melzack, R., & Wall, P. (1965). Pain mechanisms: A new theory. *Science*, *150*, 971-979.

Melzack, R., & Wall, P. (1982). *The challenge of pain*. New York: Basic Books.

Miller, G. (1969). Presidential address to the American Psychological Association.

Mosher, R. (1977). Education for human development. In R. Waller (Ed.), *Visions and realities* (pp. 53-67). Berkeley, CA: McCutchan Publishing Co.

Mosher, R., & Sprinthall, N. (1971). Psychological education: A means to promote personal development during adolescence. *The Counseling Psychologist*, *2*, 3-82.

Mowrer, D. (1950). *Learning theory and personality dynamics*. New York: Roland.

Newmark, C. S., Newmark, L., & Cook, L. (1975). The MMPI-168 with psychiatric patients. *Journal of Clinical Psychology*, *31*, 61-64.

Overall, J., & Gomez-Mont, F. (1974). The MMPI-168 for psychiatric screening. *Educational and Psychological Measurement*, *34*, 315-319.

Overall, J., Higgins, W., & DeSchweinitz, A. (1976). A comparison of differential diagnostic discrimination for abbreviated and standard MMPI. *Journal of Clinical Psychology*, *32*, 237-245.

Painter, J., Seres, J., & Newman, R. (1980). Assessing benefits of pain center: Why some patients regress. *Pain*, *8*, 101-113.

Paulson, M., & Lin, T. (1970). Predicting WAIS-IQ from Shipley-Hartford scores. *Journal of Clinical Psychology*, *26*, 453-461.

Prado, W., & Taub, D. (1966). Accurate prediction of individual intellectual functioning by the Shipley-Hartford. *Journal of Clinical Psychology*, *22*, 292-296.

Reading, A. (1983). The McGill Pain Questionnaire: An appraisal. In R. Melzack (Ed.), *Pain measurement and assessment* (pp. 57-68). New York: Raven Press.

Redd, W., & Sleaton, W. (1976). *Take charge: A personal guide to behavior modification*. New York: Random House.

Reeves, J. (1976). EMG-biofeedback reduction of tension headaches: A cognitive skills-training approach. *Biofeedback and Self-Regulation*, *1*, 217-227.

Rimm, D., & Masters, J. (1979). *Behavior therapy: Techniques and empirical findings*. New York: Academic Press.

Roberts, A., & Reinhardt, L. (1980). The behavioral management of chronic pain: Long-term followup with comparison groups. *Pain*, *8*, 151-162.

Rogers, C. (1951). *Client-centered therapy*. Houghton-Mifflin.

Roskies, E., & Lazarus, R. (1980). Coping theory and the teaching of coping skills. In P. Davidson and S. Davidson (Eds.), *Behavioral medicine: Changing health lifestyles* (pp. 221-242). New York: Brunner/Mazel.

Rotter, J. (1954). *Social learning and clinical psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Roy, R., & Tunks, E. (Eds.). (1982). *Chronic pain: Psychosocial factors in rehabilitation*. Baltimore: Williams & Wilkins.

Rudestam, K. (1980). *Methods of self-change: An ABC primer*. Monterey, CA: Brooks/Cole.

Sackett, D., & Haynes, R. (1980). *Compliance with therapeutic regimes*. Baltimore: Johns Hopkins University Press.

Sanford, F. (1955). Creative health and the principle of habeus mentem. *American Journal of Psychology*, *10*, 829-835.

Schmidt, J. A. (1976). *Help yourself: A guide to self-change*. Champaign, IL: Research Press.

Shipley, W. C. (1940). A self-administering scale for measuring intellectual impairment and deterioration. *Journal of Psychology*, *9*, 371-377.

Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.

Spivack, G., Platt, J., & Shure, M. (1976). *The problem-solving approach to adjustment*. San Francisco: Jossey-Bass.

Steger, J., & Fordyce, W. (1982). Behavioral health care in the management of chronic pain. In T. Millon, C. Green, & R. Meagher (Eds.), *Handbook of clinical health psychology* (pp. 467-498). New York: Plenum Press.

Sternbach, R. (1974). *Pain patients: Traits and treatment*. New York: Academic Press.

Sternbach, R., & Timmermans, G. (1975). Personality changes associated with reduction of pain. *Pain*, *1*, 177-181.

Sternbach, R., Wolf, S., Murphy, R., & Akeson, W. (1973). Traits of pain patients: The low back "loser." *Psychosomatics*, *14*, 226-229.

Stone, L. A., & Ramer, J. C. (1965). Estimating WAIS-IQ from Shipley Scale scores: Another cross-validation. *Journal of Clinical Psychology*, *21*, 297.

Suedfeld, P. (1982). Environmental factors influencing maintenance of lifestyle change. In R. Stuart (Ed.), *Adherence, compliance, and generalization in behavioral medicine* (pp. 279-301). New York: Brunner/Mazel Publishers.

Swanson, D. W., Maruta, T., & Swenson, W. (1979). Results of behavior modification in the treatment of chronic pain. Psychosomatic Medicine, 41, 55-61.

Thoreson, C., & Mahoney, M. (1974). Behavioral self-control. New York: Holt, Rinehart, & Winston.

Turk, D. (1977). Application of coping skills training to the treatment of chronic pain. In C. Spielberger & I. Sarason (Eds.), Stress and anxiety (pp. 174-196). New York: Brunner/Mazel.

Turner, J., & Chapman, C. (1982a). Psychological interventions for chronic pain: A critical review. I. Relaxation training and biofeedback. Pain, 12, 1-21.

Turner, J., & Chapman, C. (1982b). Psychological interventions for chronic pain: A critical review. II. Operant conditioning, hypnosis, and cognitive-behavioral therapy. Pain, 12, 23-46.

Watson, D. (1982). Neurotic tendencies among chronic pain patients: An MMPI analysis. Pain, 14, 365-380.

Watson, J. (1916). The place of the conditional reflex in psychology. Psychology Review, 23, 89-116.

Wiens, A., & Banaka, W. (1960). Estimating WAIS-IQ from Shipley-Hartford scores: A cross-validation. Journal of Clinical Psychology, 16, 452.

Williams, R., & Long, J. (1979). Toward a self-managed lifestyle. Boston: Houghton Mifflin.

Woodforde, J., & Mersky, H. (1972). Personality traits of patients with chronic pain. Journal of Psychosomatic Research, 16, 494-501.