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The University of Nebraska - Lincoln PH.D. 1986

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DEVELOPMENT OF AN MMPI SUBSCALE AND A 3-ITEM RATING SCALE TO PREDICT OUTCOME OF INPATIENT MULTIDISCIPLINARY TREATMENT OF PAIN

by

Marcia Ann Tippery

A DISSERTATION

Presented to the Faculty of

The Graduate College in the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Interdepartmental Area of Psychological and Cultural Studies

Under the supervision of Professor Robert W. Filbeck

Lincoln, Nebraska

December 1986

TITLE

Development of an MMPI Subscale and a Three Item Rating Scale to Predict Outcome of Inpatient Multi-Disciplinary Treatment of Pain

BY

Marcia Ann Tippery

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GRADUATE COLLEGE **UNIVERSITY OF NEBRASKA**

GRAD 52002 300 5-86(7)

DEVELOPMENT OF AN MMPI SUBSCALE AND A 3-ITEM RATING SCALE TO PREDICT OUTCOME OF INPATIENT MULTIDISCIPLINARY TREATMENT OF PAIN

Marcia Ann Tippery, Ph.D.

University of Nebraska, 1986

Advisor: Robert W. Filbeck

Despite the relative success of multidisciplinary inpatient management of chronic pain, significant numbers of patients either do not improve or fail to maintain improvement. Program referrals continue to exceed capacity. This study addressed the problem of how to maximize successful outcomes and utilize pain center resources more efficiently.

A number of patient characteristics and MMPI test data were evaluated as potential predictors of treatment outcome. The data were extracted from the records of 150 patients who underwent a four-week inpatient multidisciplinary chronic pain program at the University of Nebraska Medical Center between 1976 and 1982. The sample consisted of equal numbers of male and female patients with mixed pain complaints.

An item analysis of the MMPI was performed to construct a 34-item Nebraska Pain Treatment Success scale. The scale achieved a Cronbach's alpha of .5473, successfully classified nearly 90% of the 47 comparison and 45 criterion subjects, and proved to be the strongest predictor. The scale appears promising but awaits cross-validation.

The most discriminating of the non-test independent variables were age, duration of pain history, complexity of pain complaint,

employment status, and length of work disability. These findings are compatible with an operant conceptualization of chronic pain behavior.

Cluster analysis has been used in previous research to identify and replicate homogeneous subgroups of pain patients using the standard clinical and validity scales of the MMPI. The next step in this research program is to evaluate replicated subgroups for differential response to alternative treatment packages.

The present research is the first study known to have clustered the Wiggins content scales of the MMPI in an effort to identify homogeneous subgroups. No male subgroups were identified, but three distinct female subgroups clustered on 9 of 12 Wiggins scales. Future research employing larger more random samples is needed to further evaluate the usefulness of these scales for individualizing treatment and maximizing successful outcomes with this population.

ACKNOWLEDGEMENTS

I would like to acknowledge Dr. Philip W. Meilman, Ph.D., and Dr. Miles Skultety, M.D., for the resources and support which they made available for this research and for providing access to the records of patients who were treated for chronic pain at the Nebraska Pain Center, University of Nebraska Medical Center.

I would like to acknowledge Dr. Daniel Bernstein, Dr. Roger Bruning, Dr. Kenneth Keith, Dr. Royce Ronning, and Professor Lyle Eddy for their guidance and support. As members of my supervisory committee, each of these individuals made a unique contribution and commitment to the educational process which prepared me to undertake and complete this dissertation. Special appreciation is extended to my chairman, Dr. Robert Filbeck, for his friendship and numerous contributions to my graduate education.

The support and encouragement of many family members, friends and colleagues in both Nebraska and Minnesota throughout the lengthy process of completing the dissertation has been most helpful. I am especially grateful to Dr. Lyle Wray for his role in motivating the self-discipline which was needed to complete a dissertation which had been initiated in a different state. Barbara Doherty, former Acting Director of Quality Assurance, Carol Thompson, Quality Assurance Director and Assistant Commissioner Margaret Sandberg of the Minnesota Department of Human Services all facilitated the dissertation's completion by approving a flexible work schedule during the final months of writing. Their assistance is gratefully acknowledged.

The task of performing an item analysis of the MMPI was greatly facilitiated by Dr. Charles Neuringer's willingness to share a

computer program which was written at the University of Kansas for this purpose. I would also like to thank Dr. Barbara Plake, Chuck Sundermeier, Bob Kraft, and Claire Parker of the University of Nebraska for their statistical consultation and assistance with the data analysis. Sharon Alberg and Kurt Brattain of Brattain, Alberg and Associates in Minneapolis are acknowledged for their very capable consultation and assistance with the data analysis.

The sustained effort required to complete the project was made possible by virtue of the constant affection, support and encouragement of Paul Tippery who never for a moment lost faith in my ability to bring the project to completion, or ever gave any hint that the mutual sacrifices which its achievement entailed were resented. We have truly achieved this goal together.

Finally, I would like to acknowledge my father, Robert Froslev, for the role he played in my learning to value the intellectual life. You were always there to take an interest in and encourage my school achievement. You taught me educational values even though a college education was an opportunity which you were denied. I know you would be so proud if you were here today. This dissertation is dedicated to you with love and appreciation.

M.A.T.

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CHAPTER ONE

CONCEPTUAL BACKGROUND

Pain is the most frequent source of disability and suffering in the United States and most of the developed nations (Bonica, 1980a). In recent years, attention has increasingly focused on the pressing need for early identification and appropriate management of the clinical syndrome of chronic pain.

For Bonica (1980b, p. 9), "chronic pain is defined as pain which persists beyond the usual course of an acute disease or a reasonable time for an injury to heal, or it recurs at intervals for months or years." An arbitrary figure of six months is often used to designate pain as chronic. Since under normal circumstances many acute diseases or injuries heal in a matter of weeks, the diagnosis of chronic pain is more appropriately reached when a persistent, significant alteration of lifestyle combined with an extremely stable constellation of physical factors is observed. Such patients fail to show any progressive improvement while rarely becoming worse (Black, 1980).

The patient with chronic pain frequently has a history of multiple physician contacts and medical treatments which have all failed to permanently alter the complaint. Tragically, the condition of many patients does worsen over time as a consequence of iatrogenic complications which arise from faulty diagnoses and medical mismanagement, including unnecessary surgery and patient abuse of pain medication (Black, 1980). When a patient fails to improve after a series of medical interventions, health professionals often label the pain as being of "functional" origin. Patients frequently react by

adopting a defensive, adversarial posture during future contacts with the medical community (Swanson, Swenson, Maruta, & Floreen, 1978). Paradoxically, these dissatisfied patients nearly always continue their "doctor-shopping" in a perpetual quest for a medical cure for their suffering.

No entirely satisfactory definition of pain has yet been offered. Elements or terms important to some observers are almost certain to be omitted from any definition that is offered (Fordyce, 1976). Pain does not have a simple one-to-one relationship with tissue damage or body lesions (Fordyce, 1978; Merskey, 1980). A wide range of individual differences in pain tolerance are observed even when anatomical and pathological factors are approximately equal. Pain is affected by a variety of psychosocial variables on which individuals differ including anxiety, apprehension, social and cultural conditioning, fear of illness, personal experience, and the circumstances in which the injury or illness occur (Merskey, 1980). Semantic barriers to developing a more comprehensive understanding of pain abound, including conceptual dichotomies with dualistic connotations (Crue, Kenton, Carregal, & Pinsky, 1980; Fordyce, 1976; 1978). Often overlooked is the fact that "pain is not an entity or thing; it is a label that observers, including the pain sufferer, have attached to relevant phenomena they have observed or experienced" (Fordyce, 1976; p. 11).

A widely quoted definition of pain is provided by Merskey (in Weisenberg, 1975; p. 25): pain refers to "an unpleasant experience which we primarily associate with tissue damage or describe in terms of such damage, or both." This definition emphasizes the relationship of

pain to the experience of damage to the body without making any assumptions as to its causes (Merskey in Weisenberg, 1975).

Fordyce (1978) has suggested an amendment to Merskey's definition: pain refers to "an unpleasant experience which we primarily associate with tissue damage or describe in terms of such damage or both, and the presence of which is signaled by some form of visible or audible behavior" (pp. 53-54). This definition acknowledges the existence of a "suffering component" (Fordyce, 1978) in the patient's report that represents a legitimate pain problem irrespective of the presence or absence of physical findings. Pain behavior "has significance in its own right and is not to be understood solely as an automatic extension or overt expression of some underlying causative factor within the organism" (Fordyce, 1978; p. 54).

Magnitude and Cost of Chronic Pain

In contrast to acute pain, chronic pain is without apparent biologic function; furthermore, it "often imposes severe emotional, physical, economic, and social stresses on the patient and on the family and is one of the most costly health problems for society (Bonica, 1980b; p. 9). Reliable statistics on the prevalence and economic impact of pain complaints are difficult to obtain due to the absence of large scale national epidemiologic investigations of the problem. In an effort to estimate the social costs of this problem, Bonica reviewed the reports of numerous surveys on back pain, headache, and arthritis as well as data published by the Senate Subcommittee on Health, National Arthritis Board, Arthritis Foundation, the American Cancer Society, the American Heart Association, and the National Center for Health

Statistics. Using the 1974 mean income to compute the cost of work days lost and the 1978 cost figures for medical and hospital services, Bonica arrived at what he considered to be a conservative estimate of the annual cost of chronic pain to American society: " . . . well over 700 million work days are lost, which, together with health care costs and payments for compensation, litigation, and quackery, totals nearly $60 billion annually. This staggering figure . . . equals more than 10 percent of our national budget . . . ." (Bonica, 1980b; pp. 10-11).

Loeser (in Bonica, 1980a) reported figures for a population of low back pain patients who drew Workmen's Compensation benefits during 1977 in the State of Washington. During that year, there were 10,533 compensable back injuries representing 25% of the total injuries, 63.5 million dollars in compensation claims, and 36% of the state's total compensation payments. Of this group of injured workers, three-fourths did not have physical findings to support their complaints, nearly two-thirds were utilizing dependency-producing prescription drugs, and over one-quarter had been treated surgically. In Washington State, Loeser reported that the volume of claims was increasing at a much higher rate than were the numbers of new employees in the work force.

Clearly, the economic costs of chronic pain to society are enormous. Measured in terms of human suffering, the cost is incalculable:

> Pain patients pay a terrible price. It is not only that they suffer pain. Their ways of living are disrupted and perhaps virtually shattered. There may be enormous losses. But perhaps most of all, life is passing them by. As the years pass and treatment programs repeatedly

> fail to yield durable results, the sufferers must sit on the sidelines and watch their only chance at life slip by (Fordyce, 1976; p. 2).

Past and Current Deficiencies in Pain Research and Treatment

Despite its obvious social and economic impact, human pain has been a relatively neglected area of research, and "the advances in its diagnosis and therapy have not been commensurate with other biomedical scientific achievements" (Bonica, 1980a; p. 1). Consequently, there are many voids in scientific understanding of pain mechanisms, especially those related to chronic pain.

Bonica (1980a) has chronicled several historical factors associated with this lack of progress. The number of basic scientists in pain research has been small and comprised mainly of animal laboratory researchers with little or no interest in clinical applications. Bitterly opposed theoretical controversies led to conceptual stagnation for nearly a century. Like their clinical peers, scientists have been slow to recognize the differences between acute and chronic pain. As a result, animal models for chronic pain have not been developed. Because early theoretical models were predominantly concerned with anatomic and physiologic explanation, research psychologists were not encouraged to enter the field since emotional, psychological, and environmental factors were relegated to secondary roles or considered byproducts of sensation. Pain research has also been slowed by a severe shortage of available funds.

Fundamentally, the problem in pain research is at a conceptual level: traditional pain theories are too narrowly focused to serve as a

basis for comprehensive management of chronic pain. Added to the problem of inadequate conceptual models are the difficulties associated with attempts to define and measure chronic pain and the lack of appropriate psychometric tools with which to assess non-medical aspects of the pain problem.

Theories of Pain

Biological Theories

The scientific study of pain began during the first half of the nineteenth century when physiology emerged as an experimental science (Bonica, 1980a). During the next fifty years, two opposing physiologic theories were formulated that are still influential -- the "specificity" and "pattern" theories of pain.

"The specificity (or sensory) theory stated that pain was specific sensation with its own sensory apparatus independent of touch and other senses" (Bonica, 1980a; p. 9) and implied "the existence of cutaneous nerve endings responding specifically to either mechanical, thermal, or noxious stimuli" (Crue et al., 1980; p. 4). Specificity theory was rejected by many researchers on the basis of the implicit psychological assumption "that pain is determined entirely by impulses in a straight-through transmission system from the skin to a pain center in the brain" (Melzack & Wall, 1975; p. 10).

New biological theories emerged and were eventually categorized into a family of "pattern" theories. Pattern theory opposed the notion that pain has its own set of specialized receptors. It's advocates argued that there is no need to speak of pain as a primary sensory

modality or that there are pain endings, pain fibers, or pain neurons in the peripheral nervous system (Weisenberg, 1977).

Whereas the weakness of specificity theory was held to be in its psychological implications, pattern theory by itself appears to contradict physiological evidence (Melzack & Wall, 1975). In 1975 Melzack and Wall published the "gate-control" theory of pain. Gate-control theory retains elements of both specificity and pattern theories, but also attempts to account for psychological influences on pain perception, including clinical observations of the spread of pain and persistence of pain after tissue healing. According to gate-control theory, pain includes "an essential aversive cognitive-motivational and emotional component that leads to behavior designed to escape or avoid the stimulus" (Weisenberg, 1977; p. 1011).

Though it too has come under severe attack (Weisenberg, 1977; Crue et al., 1980), gate-control theory has been extremely successful in demonstrating the tremendous importance of psychological variables, in generating new interest in pain perception, and in stimulating a multidisciplinary approach to pain research and treatment (Weisenberg, 1977).

Psychosocial Theories

The oldest research tradition in the psychology of pain combines the psychoanalytic and trait psychology perspectives. Researchers in this tradition have usually assumed the presence of psychogenic (Hanvik in Welsh & Dahlstrom, 1956) or psychosomatic (Lippencott, 1976) causal mechanisms which link personality with illness and with the patient's response to treatment. The psychological traits and personal

characteristics which are inferred from structured personality inventories are assumed to have important etiological and diagnostic implications. The most widely used psychometric instrument employed in this research is the Minnesota Multiphasic Personality Inventory (MMPI).

Hanvik (in Welsh & Dahlstrom, 1956) was one of the first clinicians to use the MMPI to identify personality correlates of discrete medical diagnostic categories and to classify patient's reports of low back pain into functional and organic etiological categories. Numerous researchers have continued this line of investigation. Low back pain has been investigated most often; however, attempts have also been made to identify discriminable personality characteristics associated with cancer, cardiovascular disease, migraine, and rheumatoid arthritis (Pelletier, 1977).

Because of the retrospective nature of most of these studies, there is no way to know whether the personality profile obtained during testing reflects premorbid personality or is instead related to changes in personality associated with the disease itself (Pelletier, 1977). Researchers at the Mayo Clinic recently reported a preliminary study which was undertaken to determine if premorbid personality characteristics could predict outcome for a sample of 62 patients for whom premorbid MMPI's were on record and who later developed low-back pain which required surgery (Hagedorn, Maruta, Swanson, & Colligan, 1985). Although some differences were observed between males and females in the sample and between the sample and the comparison groups, Hagedorn et al. (1985) concluded that the results of this study strongly suggest that the MMPI configurations observed by other researchers

reflect personality changes related to the chronic pain state, rather than to premorbid personality characteristics.

Until recently, psychoanalytic and trait theories have generally overlooked the fact that MMPI profiles obtained in medical settings reliably share certain characteristics independent of the nature of the patient's reason for being seen by a physician. Elevations on the neurotic triad are commonly observed in profiles of patients undergoing routine physical exams but having no physical complaints. When the MMPI is given as part of a medical evaluation as is often the case during the screening of patients for admission to pain programs, elevated scores are to be expected and should be interpreted conservatively (Osborne, 1979; p. 159).

Rather than hypothesizing the role of internal constructs, both sociological and behavioral theories are concerned with describing "the characteristics and consequences of the behavior and the role that it may play" (Roy & Tunks, 1982; p. 4) in the course of the disease. Operant behaviorism has been particularly influential in redirecting pain treatment and research for nearly two decades. The operant perspective recognizes a continuum of pain responses comprised of both acute and chronic pain mechanisms. Chronic pain responses in particular are conceptualized as learned behaviors which are in principle alterable (Fordyce, Fowler, Lehmann, DeLateur, Sand, & Trieschmann, 1973; Fordyce, 1974(a)(b); 1976; 1978; 1980; 1982; Fordyce, Shelton, & Dundore, 1982; Roberts & Reinhardt, 1980; Roberts, 1981; Fordyce, Roberts, & Sternbach, 1985; Fordyce, Brockway, Bergman, & Spengler, in press; Chapman, 1985).

Operant pain may be acquired through at least three major