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Psychological Factors Associated with Patients' Negative Assessment of Treatment for Temporomandibular Joint (TMJ) Pain and Dysfunction

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PSYCHOLOGICAL FACTORS ASSOCIATED WITH PATIENTS' NEGATIVE ASSESSMENT OF TREATMENT FOR TEMPOROMANDIBULAR JOINT (TMJ) PAIN AND DYSFUNCTION

by

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VITA

The author, Ronni Marla Barnes, is the daughter of Harold Barnes and Eileen (Orenstein) Barnes. She was born July 27, 1961, in Evanston, Illinois.

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CHAPTER I

INTRODUCTION

The treatment of temporomandibular joint (TMJ) pain dysfunction syndrome is extensively discussed in the medical and dental literature, reflecting, in part, the increasing number of patients who seek treatment for TMJ pain and dysfunction (Hahn, 1979). The TMJ is one of the most complex joints in the body. It connects the upper and the lower jaws, which must synchronize perfectly to create the sophisticated vertical and horizontal motion necessary for eating and speaking (Zarb & Carlsson, 1979). Patients who seek treatment for problems in the TMJ area may present a variety of symptoms: dull and deep pain in the jaw, limited jaw movement, joint sounds and/or tender muscles. Patients may have one or any combination of these symptoms, though usually little or no organic pathology can be found (Lupton, 1969; Gold,1975). Pain and dysfunction in the TMJ area is often caused by a variety of interrelated physical and psychological factors. Some investigators stress that a patient's response to treatment is particularly influenced by psychological factors (Greene, Olson & Laskin, 1982). Because of the variety of factors possibly influencing the TMJ pain dysfunction syndrome and its treatment, some professionals recommend a holistic treatment approach in treating TMJ pain and dysfunction. They suggest that dentists and mental health professionals work together to form a multidisciplinary team and to design appropriate treatment stategies (Bell, 1970; Fordyce, 1976).

There are several hypotheses regarding the etiology of the TMJ pain dysfunction syndrome. The first hypothesis states that internal derangements resulting from aging, arthritis, blows to the head, or whiplash cause pathology of the TMJ and subsequent dysfunction and pain (Moss, Garrett, & Chiodo, 1982). The second hypothesis states that malocclusion causes dysfunction of the TMJ. Malocclusion occurs when the upper and the lower teeth do not fit together correctly, thereby preventing a person from biting properly and causing pain and dysfunction of the TMJ (Heiberg, Heloe, & Krogstad, 1978). The third hypothesis states that emotional stress plays a significant role in the etiology of the TMJ pain dysfunction syndrome. Because some people respond emotionally to stress by grinding and clenching their teeth, they often create tired jaw muscles and force their muscles to involuntarily contract and to go into spasms. These involuntary movements cause pain and dysfunction of the TMJ (Scott, 1981). The last hypothesis states that oral habits such as gum chewing, nail biting, jaw jutting, and cheek or lip chewing exacerbate stress that already exists in the TMJ area and thereby cause pain and dysfuction (Berkson, 1976). Because problems in the TMJ area can be caused by one or any combination of these factors, Rugh and Solberg (1976) suggest that a multifactorial view of the etiology of the TMJ pain dysfunction syndrome is most useful.

It is difficult to determine which of the factors that influence a given patient's TMJ problems occurs first. For example, a patient's difficulties might begin as a result of jaw clenching in response to stress, and after a considerable amount of time the clenching has caused damage to the TMJ and surrounding tissues. In cases like this it is difficult to determine whether the patient's psychological state caused

the pathology of the TMJ or whether the pathology existed prior to the emotional distress. Because of the difficulties inherent in attributing direct causes for TMJ, the treatment is usually not based directly on the analysis of etiologic factors but rather is directed towards alleviation of pain and restoration of normal function. Dentists provide standard medical treatment geared to alleviate patients' presenting symptoms regardless of the origin of their dental problems (Greene et al., 1982).

Previous studies have indicated that various medical treatment strategies for TMJ pain dysfunction syndrome have had the same amount of long-term success. Most of the treatments are successful at times and are unsuccessful at other times. No one form of treatment seems to produce a consistently high rate of symptom remission. This suggests that the aforementioned psychological factors are the most crucial in influencing treatment success (Greene, Lerman, Sutcher, & Laskin, 1969; Greene & Laskin, 1974).

This study examines possible psychological factors associated with the degree to which treatment is considered successful by patients and the degree to which they are satisfied with treatment. It is important to note that even if the findings indicate that there are certain psychological characteristics common to TMJ patients who evaluate treatment as unsuccessful and/or who are dissatisfied with treatment, it cannot be assumed that these characteristics correlate with the etiology of their dental symptoms (Greene et al., 1982). However, if any of these psychological characteristics differentiate successful from unsuccessful and/or satisfied from dissatisfied patients, it would indicate that these particular psychological factors are associated in some way with

patients' responses to treatment. If by examining these psychological factors prior to treatment one could determine those patents who would not be successful and/or satisfied with medical treatment, these patients could then be referred elsewhere for more appropriate treatment, thereby saving both the dentists and the patients a good deal of time, money, and frustration. Such patients might be referred for psychological treatment or for psychological treatment in conjunction with medical treatment, so that they might become more responsive to the medical services. In this way, dentists and mental health professionals can work together to assess cases and to devise the most appropriate treatment plans.

The purpose of this study is to discover psychological factors that can alert the health care professional to patients who potentially will evaluate treatment as unsuccessful and/or who will be dissatisfied with treatment who would otherwise be provided with conservative medical treatment for TMJ pain and dysfunction.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Pain and dysfunction in the TMJ have been described in the dental literature for over fifty years. These symptoms were originally described by Costen (1934). He named the symptom complex "Costen's Syndrome" and attributed these symptoms to the loss of support of the molar teeth. Costen recommended dental treatment that restored adequate occlusal vertical dimension. The next major contribution to the understanding of TMJ disorders was made by Schwartz (1955). He described a similar symptom complex, but stressed the psychogenic component of the dental problem. He stated that muscle spasms were a consistent diagnostic finding. Schwartz renamed the symptom complex the "temporomandibular joint pain dysfunction syndrome" (Schwartz, 1969). In 1969 Laskin further developed the understanding of this syndrome by stressing the lack of joint pathology in the primary symptom complex. Laskin proposed a new name for this syndrome given the change in emphasis. He named the symptom complex the "myofascial pain-dysfunction syndrome" (MPD). The symptoms Laskin described were similar to the ones described by Costen in 1934 and Schwartz in 1955. The three names describing the symptom complex refer to the same dental syndrome (S. Herzog, personal communication, June 13, 1985). Each of these names can be found in the literature on the syndrome. For the sake of clarity in this literature review the name temporomandibular joint (TMJ) pain dysfunction syndrome will be used when referring to the symptom complex, even when a source is cited

that used one of the other two names.

There are several demographic and psychological variables that characterize patients in treatment for TMJ pain and dysfunction. One important characteristic of this population is that there are more women than men. Franks (1964) gathered data on 2200 patients in eight studies from five countries and found a ratio of 4.1:1 females to males. Helkimo (1976) reviewed data on 5261 patients in 11 countries and found a 4:1 ratio of females to males. The average age of patients in treatment for TMJ pain dysfunction syndrome is 30 years old, though patients range in age from the teens to the sixties (Butler, Folke, & Bandt, 1975; Helkimo, 1976; Lupton & Johnson, 1973).

A study conducted by Fine (1971) suggested that there is a relationship between psychological factors and TMJ dysfunction. Fine's study compared 50 TMJ subjects and 50 control subjects. The study found that 76% of the TMJ subjects but only 20% of the control subjects had a psychiatric diagnosis. The majority of TMJ subjects with a psychiatric diagnosis had moderate to severe depressive symptoms and marked anxiety symptoms. These subjects were diagnosed as having "atypical depressive illnesses." Fine's results support Lupton's (1969) claim that there is a relationship between psychological factors and TMJ dysfunction. Several studies have described common personality characteristics of TMJ patients. These studies used psychiatric interviews and psychological testing to characterize TMJ patients as tense, anxious, perfectionistic, obsessive-compulsive, responsible, generous, managerial, and neurotic (Gessel & Alderman, 1971; Lefer, 1966; Lupton, 1969; Moulton, 1966; Rothwell, 1972; Schwartz, 1969). In an early study, Moulton (1955) described many patients suffering from TMJ pain and dysfunction as

excessively dependent, pleading, and ingratiating. These patients may try to cover up these traits because they tend to emphasize their psychological and emotional strengths. They consistently exhibit hypernormal behavior and deny weakness of any kind. These patients also tend to have underlying feelings of bitterness (Lupton, 1966). Heloe, Heiberg, and Krogstad (1980) further supported this when they obseved that TMJ patients restrain their aggressions, lack experience with their aggressive feelings, and tensely control all their emotions.

Perhaps as a way to maintain their self-concepts of normalcy and psychological strength, many TMJ patients seem to have developed a somatizing style of coping with stress that has either led to or exacerbated their TMJ problems. These patients choose illness, often unconsciously, as a way of life. They use their bodies for psychological and/or personal gain. There are several possible uses for somatization. A person may displace an unpleasant emotion into a physical symptom so as to avoid experiencing the emotion as described above, or a person may develop a particular physical symptom to symbolically communicate an emotion or an idea. Also, someone may unconsciously develop a painful physical symptom to relieve guilt he or she is experiencing about something, for example, ambivalent feelings he or she is having about a person who recently died. These are examples of psychological gains by use of physical symptoms. A person may also use his or her body for personal gain, such as to manipulate interpersonal relationships, to be exempted from responsibilities such as housework or a job, to financially gain through disability or worker's compensation, or to get attention from other people. A patient may develop a symptom or a group of symptoms to serve one or more of these functions. People who repeti-

tively use their bodies as a means of coping with life stresses are called somatizers (Ford, 1983).

This style of coping seems to account for the large amount of somatic tension and for the high rate of addictive oral habits found in TMJ patients. Lupton (1966) found that 80% of the TMJ patients in his study had some kind of psychosomatic disorder and that 77% of them were addicted to oral habits such as gum chewing, smoking, biting on hard objects, and teeth grinding or clenching. It seems that these patients are unable to express their frustrations directly and instead develop a way to relieve their stress through physical symptoms. Oral habits such as clenching and grinding the teeth are examples of physical means of relieving stress. These habits may cause or may exacerbate pain and dysfunction in the TMJ area.

There is evidence that patients suffering from TMJ pain dysfunction syndrome are more emotionally troubled than are other dental patients. In a study conducted by Moody, Calhoun, and Okeson (1981) patients with TMJ pain reported significantly greater levels of stress than did dental control subjects. Bock (1980) found that TMJ patients reported a significantly higher incidence of at least mild life crises over the past four years than dental control patients. These studies suggested that stress might be an important component of TMJ pain dysfunction syndrome. Moreover, another study showed that a high proportion of TMJ patients suffer from emotional problems and that these problems can influence patients' responses to treatment (Nally & Moore, 1975). Because of this, one area of research on TMJ treatment has focused on psychological variables that correlate with emotional problems and that interfere with successful treatment.

Previous Medical and Dental Experience

Abnormal Illness Behavior

One concept that has been used to describe patients who are unsuccessful with treatment is abnormal illness behavior. The term "illness behavior" was introduced by Mechanic in 1962. It refers to the ways in which people perceive, evaluate, and act in response to particular physical symptoms, including the extent to which a person identifies the existence of an illness and becomes concerned about it. The concept also refers to whether or not a person seeks treatment and how he or she responds to treatment if given. A study conducted by Speculand, Goss, Hughes, Spence, and Pilowsky (1983) showed that out of the 13% of TMJ patients who were unsuccessful with conservative treatment, over half of them gave responses on the Illness Behavior Questionnaire (IBQ) that indicated abnormal illness behavior. The IBQ is a self-report questionnaire used to assess patients' illness behavior. As with other patients with intractable pain, these non-responding TMJ patients showed patterns of organic preoccupation and disease conviction. Often, patients who are preoccupied with their health, like these patients, have long histories of medical treatment. In a one year follow-up study conducted by Feinman, Harris, and Cawley (1984), the TMJ patients who failed treatment had complex histories of ill health and previous unsuccessful dental and surgical treatments for facial and other pains. One study (Lipton & Marbach, 1984) found that significantly more unsuccessful than successful TMJ patients had previously consulted three or more doctors for relief of their pain. Many non-responding TMJ patients had gone through recurrent patterns of unsuccessful and frustrating treatments with a variety of clinicians. The most difficult cases were those deal-

ing with patients whom had been previously assured that there were mechanical ways to relieve their pain; they had been promised complete cures by their doctors. When treatment failed, these patients looked for other doctors to fulfill their expectations of a complete cure. As these patients went from doctor to doctor, they became more disillusioned, more resentful, and less responsive to treatment. These findings suggest that patients' previous experiences with treatment can influence their attitudes and responses to present forms of treatment (Moulton, 1966).

Dental Anxiety

Another variable that can contribute to patients' negative responses to treatment for TMJ pain and dysfunction is dental anxiety. Richardson (1936) pointed out that intense dental fear or anxiety can make patients obstinate, unreasonable, and problematic for dental personnel. Often children are conditioned to fear the dentist by their parents' behavior. For example, before a child visits the dentist his or her parent may comment that there is nothing to be afraid of; the parent assumes the child is afraid of the dentist. The parent may also tell the child not to think about the upcoming visit to the dentist because the dentist will not hurt him or her. These behaviors often have the exact opposite effect of what they were intended to do, take away the child's fear. After hearing these comments, the child often has a hard time not thinking about the visit to the dentist and wonders if the dentist will hurt him or her. The child may not have been afraid of the dentist before, but the parent has introduced fear and has taught the child to fear the dentist. Quite often fears like this that are aquired

in childhood remain throughout the adult years and can cause problems. The attitudes and experiences of a patient's entire family in regards to dentistry can also influence a patient to fear the dentist if the family members share these with the patient. Again, the patient learns to fear the dentist by the behavior and attitudes of the people in his or her environment (Shoben & Borland, 1954).

Auerbach, Kendall, Cuttler, and Levitt (1976) stated that the degree of anxiety experienced in dental situations is often related to the occurrence of previous dental or medical contacts of an aversive nature. Patients may have had negative experiences with dentists in the past and then enter new dental treatments feeling anxious because they expect to have another bad experience. These patients have learned to fear the dentist through past experience.

Moulton (1966) claimed that dental fear has a unique quality because the mouth is an essential area of the body. The mouth has deep emotional significance because it is a human's original weapon and it is essential for breathing, eating, and swallowing. She suggested that for some people, dental procedures are associated with the immobilization or the invasion of the mouth and are therefore a threat to their life-sustaining functions. These associations can lead to feelings of helplessness and panic in these patients when they have contact with dentists.

Regardless of the causes of dental fear, Hordern (1977) stated that dental fear or anxiety can impede treatment if either becomes intense or phobic in nature.

Expectations from Treatment

Another variable that may be associated with success of TMJ treatment is patients' expectations from treatment. Patients' attitudes and emotions, which influence their expectations from treatment, can greatly affect the progress of an illness and the treatment received for it (Ford, 1983). If patients' goals for treatment are not met they will probably be disappointed with their treatment and will consider it unsuccessful.

Patients' expectations from TMJ treatment are often influenced by a combination of their present physical problems, the information they have about treatment, and their past experiences with pain and medical treatment. The amount of discomfort and the level of functioning that patients experience prior to beginning treatment may affect how much they expect treatment will help them. It seems likely that patients who experience a small amount of pain and have few problems functioning will have low expectations from treatment and patients who experience a good deal of pain and have severe problems functioning will have high expectations from treatment. However, patients' expectations are probably influenced by other factors as well, such as by information they receive from the media and from other patients undergoing TMJ treatment. For example, a patient may read a story in a magazine about another patient who began TMJ treatment experiencing severe pain and who was unable to hold down a job because of the pain. The patient in the story may have fully recovered after treatment and gone on to pursue a successful career. The patient reading the article may them begin TMJ treatment expecting that it will also take away all of his or her pain and subsequent social or occupational problems, regardless of the unique quali-

ties of his or her circumstance.

Another factor that may influence patients' expectations regarding treatment is their past experiences in dealing with pain. For example, if patients have successfully managed other illnesses and pains in the past, they will probably be confident that they will be able to successfully manage their TMJ pain as well. It also seems likely that patients who have had positive experiences with doctors, where they felt the doctors helped and supported them, will expect a new doctor to be able to help them as well. This is especially true if patients are beginning TMJ treatment with dentists with whom they have already established a good working relationship.

Moulton (1966) stated that some TMJ patients, such as the somatizers described earlier, have unrealistic goals for treatment that are significantly different from their doctors' goals. These patients will probably be disappointed with their treatment. In a report based on psychiatric interviews with 35 TMJ patients who were difficult to treat, Moulton (1955) stated that the most recalcitrant TMJ patients had tremendous needs to find specific and effective cures for their problems. She noted that the problems of these patients were often a combination of minor dental irregularities and of long-standing life problems. These patients wanted the dentists to take away all of their difficulties and give them "magic" cures. Most of these patients were in tense life situations, situations that had been increasing in intensity for years. They began to focus on their physical health and dental problems as a way of distracting from their seemingly insoluble life problems. This may explain the recalcitrant nature of these patients. They were afraid to get better from treatment because that would mean leaving

their doctors and giving up their familiar somatizing style of coping with the anxiety and the stress in their lives. When termination seemed imminent, these patients' symptoms often reappeared and new symptoms emerged. Recalcitrant patients tended to crave chronic support from their dentists. However, because they had unrealistic expectations that their dentists would solve all of their problems, these patients often projected their feelings of frustration onto their dentists and got angry at them. These feelings of frustration and anger could interfere with successful treatment. One way to detect patients' expectations from treatment is to ask them how their lives would be changed if they could be cured of their dental symptoms right now. The patients who were not using the symptoms as a way of coping with life problems would say that they did not see how anything would be different, except that they would be more comfortable and would be freed from distress. Patients who were using the symptoms as a way of coping with life problems and to manipulate the environment and other people, would describe how they would then, for example, be able to marry, be able to get a job, or be able to return to their artwork. These patients believed that their dental problems prevented them from adjusting to life (Scheman, 1980). Misperceptions such as these and unrealistic expectations about treatment often indicate that patients will not be successful or satisfied with treatment.

Interpersonal Style

Another psychological factor that is involved in treatment success is the capacity for interpersonal contact (CIC). Good CIC was defined by Heloe et al. (1980) as the "capacity for entering into a mature,

mutual, and equal relationship with another person. The emotional relationship is flexible and balanced and may vary from intimacy and closeness to distance and objectivity" (p.111). A patient's CIC may be apparently good, mildly disturbed, or severly disturbed. A 1 1/2 year follow-up study conducted by Heloe and Heiberg (1980) with female TMJ patients (N =108), showed that those patients who reported their conditions were worse than when they began treatment had, as a rule, severly disturbed CICs. Those patients who reported no change in their conditions were likely to have either apparently good CICs or severly disturbed CICs. Patients CICs were assessed by interviews with psychiatrists. This study indicated that long range treatment outcome may be related to CIC. This is one of the few studies that focused on patients' assessments of treatment (i.e., subjective assessments) rather than on objective assessments of treatment success based on clinical evaluations.

There are several alternative explanations for the possible association between treatment outcome and patients' CICs. One possibility is that patients who have problems relating to other people often experience frustration. These patients may unconsciously begin to relieve their frustrations by grinding their teeth, a common symptom of patients who complain of TMJ pain and dysfunction. This grinding often creates or exacerbates patients' pain, and in order for treatment to be successful patients must become aware of their grinding and make a conscious effort to stop it. This is often quite difficult to do and in this way, patients with poor CICs may be less successful with treatment.

Another possible explanation was proposed by Heiberg et al. (1978) based on a study they conducted where 4 out of 28 patients undergoing

treatment for TMJ disorders were considered "multiproblem patients"; they were the most difficult to treat. These authors hypothesized that because these 4 patients had limited capacities for contact and lacked lasting interpersonal relationships, they adopted patient lifestyles and overused the health services available to them. The authors suggested that these patients' unconscious motives for seeking dental treatment were to achieve human understanding and contact in the relatively secure and structured doctor-patient relationship. These recalcitrant patients' dependency needs may have motivated them to seek treatment. A study conducted by Lefer (1966), a psychoanalyst and a dentist, suggested that TMJ patients often sought dentists to replace actual or threatened ruptures of currently important symbiotic relationships. When these patients were given conservative mechanical treatment, their dependency needs were not met and the dentists became the object of the patients' displaced and transferred feelings. The patients often felt angry at the dentists for not offering the assistance that they desired and attempted to defeat the dentists by increasing their dental symptoms. If patients sought treatment to substitute for the lack of interpersonal relationships in their lives, it would seem probable that dental treatment would not be successful and that the patients would not be satisfied because the reasons for their dissatisfactions were psychological rather than dental (Hordern, 1977).

Another explanation for the possible association between treatment outcome and patients' CICs is based on Ford's (1983) statement that the doctor-patient relationship is an active and potent force that can be essential to any treatment and is particularly important in the treatment of somatizing patients. The relationship between the dentist and

the patient, in this case, can greatly influence treatment outcome. Patients with disturbed CICs may have a difficult time relating to their dentists and this may interfere with their treatment. These patients may have difficulties communicating their needs and expectations to their dentists or they may be unable to articulate the exact nature of their symptoms. These difficulties may prevent the dentist and the patient from meeting their mutual needs, one of which is to relieve the patient of his or her pain and dysfunction.

The doctor-patient relationship is also important because of the placebo effects of therapy. Medical treatment for TMJ pain dysfunction syndrome is often successful because of the mechanical procedures involved, but for many patients a crucial component of treatment success is the placebo effect. The existence of placebo effects in therapy of all kinds have been recognized for a long time (Beecher, 1955; Lasagna, 1954). Many patients with TMJ pain and dysfunction respond positively to placebos and other intangible aspects of therapy because psychological factors play a significant role in the course and remission of TMJ disorders. One study showed that 52% of the participating TMJ patients reported some improvement in their condition 1 week after given a prescription for Myolax, a placebo drug. This drug was dispensed with enthusiastic endorsement within the framework of a conventional doctor-patient relationship. This study showed that psychological interactions and the procedural aspects of doctor-patient relationships could stongly influence the outcome of therapy; placebos could contribute to treatment success (Laskin & Greene, 1972). Scott (1980) suggested that the greater a person's overall life impairments, the less likely the person is to benefit from a placebo given within a medical context and

the less likely he or she is to respond to conservative medical treatment of any kind. Therefore, it is difficult to provide successful treatment for patients who have TMJ problems and psychological disorders (Reade, 1984).

As previously mentioned, TMJ patients tended to emphasize their psychological and emotional strengths. Quite often those patients who did not respond to treatment were those who not only concealed their emotional problems but also were in need of psychiatric assistance (Harris, 1974). One feeling that unsuccessful patients often tried to hide or deny was anger. Moulton (1955) mentioned that recalcitrant patients often had large amounts of anger and aggression which required inordinate efforts to repress and control. These patients felt guilty because they were angry and felt a stong need to control this anger and to avoid conflict. The patients used physical symptoms to contol their anger and to express their frustrations and anxieties. Moulton observed that these patients were unusually anxious. A study by Rothwell (1973) showed that patients who failed to succeed with conservative treatment also had significantly higher neuroticism scores on the Eyesenck Personality Inventory than did the patients who succeeded with treatment.

Neurotic Triad

One psychological test that has been used by several investigators to determine whether or not patients' responses to medical treatment were related to their personality profiles is the Minnesota Multiphasic Personality Inventory (MMPI). In 1979, Schwartz, Greene, and Laskin compared MMPI test results of 42 successfully treated female TMJ patients with 42 unsuccessfully treated female TMJ patients. No signif-

icant differences were found between the two groups; they were similar in personality makeup. The profile patterns for both groups were diagnostic of psychophysiological disorders marked by repression and somatization. Therefore, both groups scored highest on the Hysteria and Hypochondriasis scales. Although their profiles were similar, the non-responding patients had significantly higher profiles, indicating overall greater emotional distress. The mean (K corrected) T-scores of the non-responding patients were higher than those of the responding patients on all of the clinical scales of the MMPI. There were no differences in the validity scale scores of the two groups. The two groups differed at the 1% level of significance on the Depression and Psychopathic Deviate scales, indicating that the non-responders primarily differed from the responders in their degree of depression and in their degree of either agitation or anger. In general, patients who were unsuccessful with conservative medical treatment had more emotional distress, more depression, and more anger than did patients who were successful with treatment. The unsuccessful patients also functioned at lowered levels of emotional maturity than did successful patients.

These results are similar to the results of a study conducted with patients with low-back pain (LBP) who were unsuccessful with medical treatment. The MMPI profiles of LBP patients were parallel to those of the TMJ patients, except that the LBP profiles were even higher on the Hypochondriasis, Depression, and Hysteria scales, the scales that comprise the neurotic triad. The LBP patients who were unsuccessful with treatment had higher elevations on most of the clinical scales of the MMPI than did the successful patients, with significantly higher T-scores on the scales comprising the neurotic triad. These elevations

are indicative of a collapse of the defense mechanisms with consequently higher depression and somatic concern (Sternbach, Wolf, Murphy, & Akeson, 1973). In a study conducted by Wiltse and Rocchio (1975) it was found that the best predictors of treatment response for LBP patients were the Hypochondriasis and Hysteria scales on the MMPI. The similar relationship between scale scores and treatment responses between TMJ patients and LBP patients led Schwartz et al. (1979) to say that the neurotic triad scale scores appeared to have value in predicting TMJ treatment responses, with the Depression scale the best predictor. Studies such as Millstein-Prentky and Olson's (1979) question the use of single scales in predicting treatment response. These investigators developed a 29-item scale of MMPI items that distinguished between successful and unsuccessful TMJ patients. When this scale was used to predict treatment responses for a new group of patients, its effectiveness greatly decreased. Although there might be differences in profile elevations that could predict response to treatment, a single scale might not be useful.

Depression

Authors such as Gessel (1975) supported the idea that a patient's depressive state could predict his or her response to medical treatment. The depressive process has been sufficiently powerful in some patients to prevent symptom remission. Sometimes physical symptoms developed to mask the depression and when the depression was treated the accompanying physical symptoms were also alleviated. Lascelles (1966) agreed with this when he said that prolonged facial pain was a symptom of an underlying depressive state. Others said that depression was a result of

chronic pain. Hendler (1984) pointed out that when a once well-adjusted person suffered from chronic pain (pain that persisted for over 6 months), he or she would experience marked depression and would have elevated scores on the neurotic triad scales of the MMPI, with the Depression scale being the most elevated. This was further supported by a study conducted by Olson and Schwartz (1977). They compared the Depression scale scores on the MMPI of TMJ patients, Mayo clinic medical outpatients, and control subjects, all of whom were women between the ages of 20 and 40. The TMJ patients and the Mayo clinic patients had identical Depression scale scores of 60, indicating a slight elevation in depression. The control subjects had a Depression scale score of 50. A score of 70 or more usually indicates psychopathological depression. Because TMJ patients' elevated Depression scale scores were comparable to those of other medical outpatients, the authors concluded that the slight elevation in depression for TMJ patients was probably due to TMJ patients' concerns for their physical health and was not the cause of their physical problems. Regardless of whether the depression caused the TMJ problems or the depression was a result of the TMJ problems, many patients with TMJ pain dysfunction syndrome were depressed. If depression is not specifically treated, it may interfere with the abatement of TMJ symptoms. Scott and Gregg (1980) stated that chronic pain patients, like unsuccessful TMJ patients, were almost invariably depressed. Their depression was linked to a number of important changes in the central nervous system, including lowered levels of several monoamine neurotransmitters. These lowered levels might have interfered with patients' sensitivity to pain, reactivity, and sleep patterns, all of which could have been detrimental to successful medical treatment.

Depression could create difficulties in dental treatment. It could reduce the rate of salivation and thus interfere with dental procedures. Depressed patients might also be less likely to comply with suggestions for oral hygiene necessary for proper dental treatment. Depressed patients tend to have high expectations from dental treatment; they expect treatment to cure problems other than just dental problems. Eliminating depressive symptoms, whether or not they were the cause of the TMJ problems, often has increased the cooperation and motivation of patients and has increased the chances of successful treatment (Beck, Kaul, & Weaver, 1979).

There appear to be several factors that can alert clinicians to patients who will not be successful with conservative medical treatment for TMJ pain and dysfunction. It is important that these patients receive appropriate treatment that will alleviate their symptoms. If psychological factors are not considered in treatment strategies for these patients, certain treatments might aggravate the patients' dental problems. For example, if a patient's symptoms were caused by conditions associated with tension, and irreversible treatment aimed at eliminating occlusal interferences was given, treatment would only serve to aggravate the condition (Schwartz & Chayes, 1968). Psychological factors need to be considered when planning alternative treatment strategies for these unsuccessful patients.

One surprising finding in a study conducted by Greene and Laskin (1983) was that most of the 130 successfully treated patients studied and most of the 45 unsuccessfully treated patients studied were satisfied with the conservative treatment they received. The patients' evaluations of the success of treatment were not associated with their sat-

isfaction with treatment. There are at least a few possible explanations for this finding. Greene and Laskin suggested that these patients expressed satisfaction with their treatment even though they failed to respond to it because they did not assume that the conservative approach to treatment used was inappropriate just because it was unsuccessful. Also, it is possible that these patients felt dependent on their dentists and were less likely to express dissatisfaction to the researchers about them or the treatment they provided because they did not want their dentists to reject them. It is also possible that these patients experienced cognitive dissonance because they put a good deal of time, money, and effort into their TMJ treatment and it did not relieve them of their dental problems. To relieve some of the dissonance these patients may have said they were satisfied with treatment.

Even though patients may express satisfaction with treatment, the ultimate goal of clinicians is to provide successful treatment and to alleviate patients' presenting symptoms of TMJ pain and/or dysfunction. The purpose of this study was to uncover psychological factors that could predict those patients who would not be successful and/or satisfied with conservative medical treatment. This information would enable clinicians to provide these patients with alternative treatments and would increase the patients' chances for successful symptom alleviation.

CHAPTER III

METHOD

Overview

This chapter will outline the methodology used to achieve the goals of this study. Information regarding the sample, the instruments, and the procedure will be presented in detail. Also, the hypotheses of the study will be described as will the statistical methods used to test the hypotheses.

Subjects

The data for this study were collected using 40 patients (38 female, 2 male) who were evaluated and treated in the TMJ and Facial Pain Center in the College of Dentistry at the University of Illinois at Chicago. This center mainly provides conservative and therefore reversible medical treatment for patients presenting TMJ problems. Treatment often consists of recommending softer diets or heat packs to patients, and of fitting patients with removable bite plates or occlusal splints. Occlusal splints are used to correct upper and lower jaw fits. Patients in this study ranged in age from 18-61 years ($M = 30.80$, $SD = 8.65$). Complete data were collected for 35 patients and partial data were collected for five patients due to time constraints. The staff at the TMJ and Facial Pain Center provided a list of patients who met the subject parameters of the study. All potential subjects must have been in treatment for a minimum of 6 months. All patients meeting this cri-

terion were approached regarding their voluntary participation in the study.

Instruments

Dental Screening Inventory. The Dental Screening Inventory (DSI) is an 89-item protocol divided into nine sections. This instrument was designed specifically for the purpose of this study (Rogers, 1984). The first section is used to obtain demographic information about the patients: their home addresses, their educational levels, their telephone numbers, and the best times they can be reached by telephone at home. The second section is used to obtain information regarding patients' medical and dental histories. Sections three through eight are used to measure patients' ratings of symptoms and impairments associated with their dental problems and patients' expectations from TMJ treatment. These sections divide patients' problems into six subsections: pain, eating, speaking, facial expressions, social problems, and personal issues. Patients were asked to rate their present symptoms and impairments and what they expected these would be after treatment on a 4-point Likert scale ranging from zero (no problem or difficulty) to three (major problem or difficulty). The last section of the DSI was designed to measure patients' ratings of various components of their interpersonal styles. Patients were asked to rate each item on a 4-point Likert scale ranging from zero (never) to three (frequently) (See Appendix A).

Minnesota Multiphasic Personality Inventory-168. The Minnesota Multiphasic Personality Inventory-168 (MMPI-168) is an abbreviated version of the standard 566-item MMPI (Hathaway & McKinley, 1943). It consists of

the first 168 items of the standard form. The MMPI-168 has 168 true-false items and generates T-scores on three valdity scales and 10 clinical scales. Standard scoring stencils are used to calculate MMPI-168 raw scores, and then regression equations or tables are used to transform the raw scores into estimates of standard clinical scale scores (Overall, Higgins, & DeSchweinitz, 1976). The MMPI is an objective personality assessment technique widely used among practicing clinicians. It is used to generate descriptions and inferences about individuals on the basis of their test profiles.

Several studies indicate that most of the information in the conventional clinical scales is well represented in the first 168 items of the MMPI. A study conducted by Overall and Gomez-Mont (1974) investigated the validity of the MMPI-168 by correlating T-scores on the 373-item short form of the MMPI with T-scores on the MMPI-168. The sample for this study consisted of 339 patients covering a wide range of psychiatric diagnoses. The product moment correlations between the two forms ranged from .79 on scale number nine to .96 on scale number one, with an average product moment correlation of .88. Other studies indicated that correlations between the standard scores and the MMPI-168 scores for psychiatric patients, medical patients, and normal college students ranged from .77 to .97 (Graham, 1977). The high degree of correlation on the validity and clinical scale scores between the two forms suggested that most of the reliable variance in the longer form is contained in the abbreviated version.

Overall and Gomez-Mont also compared the intercorrelation patterns among scales within the profiles between the standard and the abbreviated MMPI. They indicated that a high degree of similarity was evident

among these patterns.

In comparing overall profile patterns, Faschingbauer and Neumark (1978) indicated that psychiatric and medical patient groups' mean profiles on the MMPI-168 and on the standard MMPI were extremely similar in overall configuration.

Neumark, Neumark, and Cook (1975) investigated the comparative utility of the MMPI-168 in decision making situations. They compared the number of cases in which the MMPI-168 led to accurate decisions and when it led to inaccurate decisions regarding the validity of the corresponding standard MMPI profile. Of the 27 (39%) male invalid standard test profiles and 25 (36%) female invalid standard test profiles, 24 (88%) males and 23 (92%) females had invalid corresponding MMPI-168 profiles. Decisions regarding validity based on the MMPI-168 concurred in all but two cases with the standard MMPI. The validity of the MMPI-168 was further supported in a study by Faschingbauer and Neumark (1978). They indicated that the MMPI-168 was 95% accurate with psychiatric patients and 96% accurate with medical patients in determining profile validity as compared to the standard form.

Neumark and Finch (1976) investigated the diagnostic efficacy of the MMPI-168. The sample for their study consisted of 97 male and 135 female psychiatric inpatients. Each profile was independently interpreted by two clinical psychologists. The psychologists' interpretations were compared to see if they concurred on a general diagnosis. The clinicians agreed on a diagnosis in 91% of the profiles. Ten of these profiles were readministered to the psychologists to access rater reliability. Each rater obtained perfect reliability. In addition, chi-square analysis revealed no significant differences in diagnostic

accurracy as a function of MMPI form. The MMPI-168 misclassified 12% of the profiles while the standard 566-item form misclassified 16% of the profiles.

The MMPI-168 takes approximately 35 minutes to complete.

Patient Evaluation Form. This three item instrument was designed specifically for the purpose of this study. It required patients to rate three items on a 5-point Likert scale. The first item asked patients to rate their present comfort levels in terms of TMJ symptoms from one (extremely uncomfortable) to five (extremely comfortable). The second item asked patients to rate their abilities to function in light of their TMJ symptoms since beginning treatment from one (declined considerably) to five (improved considerably). The last item asked patients to rate their overall levels of satisfaction with treatment from one (extremely dissatisfied) to five (extremely satisfied) (See Appendix B).

Doctor Evaluation Form. This instrument was administered to the doctors and required them to rate three items on a 5-point Likert scale. It was generated specifically for the purpose of this study. The first item asked the doctors to rate patients' abilities to function in terms of their TMJ symptoms since beginning treatment. The second item asked them to rate patients' range of motion in terms of their TMJ symptoms since beginning treatment. Both of these items were rated on a scale ranging from one (declined considerably) to five (improved considerably). The last item asked the doctors to rate patients' symptom development since beginning treatment from one (significantly increased in intensity) to five (disappeared completely) (See Appendix C).

Procedure

Patients whose names were on the list of potential subjects for this study were approached during their regularly scheduled appointments at the TMJ and Facial Pain Center and were asked to participate voluntarily in the study. These patients were told the purpose of the study and the experimental procedures that were to be used. They were informed that there were no negative consequences anticipated as a function of their participation and that available dental services would be provided regardless of their participation. Patients were informed that they could withdraw from the study at any time without prejudice. Patients were told that all subjects would be assigned code numbers and all raw data would be number coded and entered into a computer file in this manner so as to insure confidentiality. A master list of subjects' names and code numbers was kept in a private file by the investigator so that individual test results could be located if subjects wanted to discuss their results in a private debriefing session when the study was completed. After these conditions were explained to patients, patients agreeing to participate in the study were asked to sign consent forms. These consent forms gave the investigator permission to review patients' medical files and they indicated that the purpose of the study and the risks involved in the study were explained to the patients. It also stated that patients understood that the study would have no affect on treatment and was not intended to benefit patients' personal health in any way (See Appendix D). Patients' signatures on this consent form indicated that they freely and voluntarily agreed to participate in the study under these conditions. All of the patients who were asked to participate in the study agreed to do so, except one female patient.

This patient initially agreed to participate in the study but withdrew her offer when she was told that she needed to sign a consent form. The woman stated that she was not comfortable signing her name on a consent form.

Participating patients were seated in the waiting room inside of the TMJ and Facial Pain Center where they completed the DSI, the MMPI-168, and the Patient Evaluation Form. Patients were asked to complete these inventories before the doctor saw them for their appointment. If subjects were not able to complete the inventories by this time, they proceeded to finish them immediately after the appointment.

After the appointment, the doctor who saw the patient that day completed the Doctor Evaluation Form.

All subjects were debriefed after they completed the inventories. They were told they could contact the TMJ and Facial Pain Center when all of the data for the study were collected and analyzed so they could arrange a feedback session with the investigator. During this session the investigator and the subjects discussed the findings of the study, the subjects' individual test results, and any other concerns subjects had regarding the study and their participation in it.

Hypotheses and Statistical Procedures

Multivariate statistical procedures were used to analyze the data. This study used a multivariate design to examine the relationship among predictor variables and subjects' assessments of TMJ treatment, the dependent variable. Subjects' assessments of treatment had two major components: subjects' evaluations of the success of treatment and subjects' satisfaction with treatment. Success of treatment was determined

by the item on the Patient Evaluation Form regarding the patients' improvement in the ability to function in terms of their TMJ symptoms. Subjects who rated this item a four or above were considered successful and subjects who rated this item a three or below were considered unsuccessful. Satisfaction with treatment was determined by the item on the Patient Evaluation Form regarding patients' overall satisfaction with treatment. Subjects who rated this item a four or above were considered satisfied and subjects who rated this item a three or below were considered dissatisfied.

Hypotheses

Due to the large number of hypotheses, the hypotheses will be grouped into four sections. Section one will include the hypotheses used to examine the relationship among subjects' evaluations of the success of treatment and the predictor variables. Section two will include the hypotheses used to examine the relationship among subjects' ratings of satisfaction with treatment and the predictor variables. Section three will include the hypotheses used the examine the doctors' and the subjects' evaluations of the success of treatment, and their relationship to the predictor variables. Section four will include the hypotheses used to examine subjects who rate satisfaction with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment, and their relationship to the predictor variables.

Success of Treatment

1) There are no significant differences between successful and unsuccessful subjects on the DSI variables regarding previous medical and dental experiences.

2) There is no relationship between subjects' levels of success with treatment and the DSI variables regarding expectations from treatment.

3) There are no significant differences between successful and unsuccessful subjects on the interpersonal style variables on the DSI.

4) There are no significant differences in the mean scores of the clinical scales on the MMPI-168 between subjects who rate treatment successful and subjects who rate treatment unsuccessful.

5) None of the independent variables (clinical scale scores on the MMPI-168) are significant predictors of success of treatment, the dependent variable. The multiple correlation coefficient formed between the dependent variable and the independent variables is equal to zero.

6) There are no significant differences on variables that characterize subjects who rate treatment successful and those that characterize subjects who rate treatment unsuccessful, as measured by the clinical scale scores on the MMPI-168.

Satisfaction with Treatment

7) There are no significant differences between satisfied and dissatisfied subjects on the DSI variables regarding previous medical and dental experiences.

8) There is no relationship between subjects' levels of satisfaction with treatment and the DSI variables regarding expectations from treatment.

9) There are no significant differences between satisfied and dissatisfied subjects on the interpersonal style variables on the DSI.

10) There are no significant differences in the mean scores of the clinical scales on the MMPI-168 between subjects who are satisfied with

treatment and subjects who are dissatisfied with treatment.

11) None of the independent variables (clinical scale scores on the MMPI-168) are significant predictors of satisfaction with treatment, the dependent variable. The multiple correlation coefficient formed between the dependent variable and the independent variables is equal to zero.

12) There are no significant differences on variables that characterize subjects who are satisfied with treatment and those that characterize subjects who are dissatisfied with treatment, as measured by the clinical scale scores on the MMPI-168.

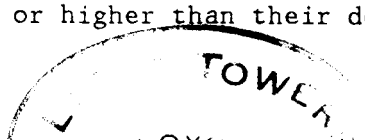
Drs' and Subjects' Evaluations of the Success of Treatment

13) There are no significant differences on the DSI variables regarding previous medical and dental experiences between subjects who rate success of treatment less than their doctor and subjects who rate success of treatment equal to or higher than their doctor.

14) There are no significant differences on the DSI variables regarding expectations from treatment between subjects who rate success of treatment less than their doctor and subjects who rate success of treatment equal to or higher than their doctor.

15) There are no significant differences on the interpersonal style variables on the DSI between subjects who rate success of treatment less than their doctor and subjects who rate success of treatment equal to or higher than their doctor.

16) There are no significant differences in the mean scores of the clinical scales on the MMPI-168 between subjects who rate success of treatment less than their doctors and subjects who rate success of treatment equal to or higher than their doctors.



Success of Treatment and Satisfaction with Treatment

17) There are no significant differences on the DSI variables regarding previous medical and dental experiences between subjects who rate saisfaction with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment.

18) There are no significant differences on the DSI variables regarding expectations from treatment between subjects who rate satisfaction with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment.

19) There are no significant differences on the interpersonal style variables on the DSI between subjects who rate satisfaction with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment.

20) There are no significant differences in the mean scores of the clinical scales on the MMPI-168 between subjects who rate satisfaction with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment.

Table 1 provides an overview of the hypotheses tested and the statistical procedures used to test them. To supplement these analyses, correlation coefficients were computed to determine the linear relationship between the various variables measured by the MMPI-168, the DSI, the Patient Evaluation Form, and the Doctor Evaluation Form.

Any other statistical analyses deemed important were run. These will be reported as they bear on the hypotheses.

TABLE 1

Hypotheses and Statistical Procedures

Hypothesis	*Statistical Procedure*
1	Kruskal-Wallis
2	Pearson Correlation Eta Correlation
3	Kruskal-Wallis
4	One-way Analysis of Variance
5	Multiple Regression
6	Discriminant Analysis
7	Kruskal-Wallis
8	Pearson Correlation Eta Correlation
9	Kruskal-Wallis
10	One-way Analysis of Variance
11	Multiple Regression
12	Discriminant Analysis
13	Kruskal-Wallis
14	Kruskal-Wallis
15	Kruskal-Wallis
16	One-way Analysis of Variance
17	Kruskal-Wallis
18	Kruskal-Wallis
19	Kruskal-Wallis
20	One-way Analysis of Variance

CHAPTER IV

RESULTS

Overview

The results will be discussed in the following manner: first, the statistical findings regarding each hypothesis of the study will be discussed and then the validity of the subjects' MMPI-168 test profiles will be discussed. Only results that were significant at the .05 level will be reported.

Hypotheses

A Kruskal-Wallis one-way analysis of variance was used to test the first hypothesis that there are no differences between successful and unsuccessful subjects on the DSI variables regarding previous medical and dental experiences. The analysis revealed significantly different mean ranks for the DSI variable regarding previous medical treatment for pain other than dental pain for successful and unsuccessful subjects. The mean rank for successful subjects was 23.14 (n = 22) and the mean rank for unsuccessful subjects was 15.94 (n = 17). Subjects who were successful with treatment had, on the average, more previous medical treatment for pain other than dental pain than subjects who were unsuccessful with treatment. This finding is contrary to previous research that indicated that subjects who were unsuccessful with treatment had more previous unsuccessful medical treatments for facial and other pains than subjects who were successful with treatment. A chi-square value

(corrected for ties) of 5.37, $p < .05$, was found to be significant.

Pearson and eta correlation coefficients were computed to test the second hypothesis that there is no relationship between subjects' levels of success with treatment and the DSI variables regarding expectations from treatment. A linear relationship was found between subjects' expectations from treatment regarding their abilities to close their mouths and treatment success ($r = .28$, $p < .05$, one-tailed). A linear relationship was also found between subjects' expectations regarding whether or not treatment would affect how irritable they were and treatment success ($r = .29$, $p < .05$, one-tailed). No curvilinear relationships were found between subjects' expectations from treatment and treatment success.

To test the third hypothesis that there are no differences between successful and unsuccessful subjects on the interpersonal style variables on the DSI, a Kruskal-Wallis one-way analysis of variance was used. This procedure revealed significantly different mean ranks for successful and unsuccessful subjects for the interpersonal style variable on the DSI regarding subjects' ratings of how often they closely followed directions. Successful subjects had a mean rank of 23.87 (n =23) and unsuccessful subjects had a mean rank of 15.94 (n =17). Subjects who were successful with treatment, on the average, reported that they more often closely followed directions than the unsuccessful subjects did. A chi-square value (corrected for ties) of 6.23, $p < .05$, was found to be significant. This finding suggests that subjects who closely follow directions may be more likely to comply with their doctors' suggestions and therefore more likely to be successful with treatment than subjects who do not closely follow directions and do not com-

ply with their doctors' suggestions.

The statistical procedures used to test the fourth hypothesis, that there are no differences in the mean scores of the clinical scales on the MMPI-168 between successful and unsuccessful subjects, revealed no significant findings. These results are contrary to the results cited in previous research indicating that the MMPI is a good predictor of TMJ treatment response and will differentiate successful and unsuccessful subjects.

The statistical procedures used to test the fifth hypothesis, that none of the clinical scale scores on the MMPI-168 are significant predictors of success of treatment, also revealed no significant findings.

A discriminant analysis was completed to test the sixth hypothesis that there are no differences on variables that characterize subjects who rate treatment successful and those that characterize subjects who rate treatment unsuccessful, as measured by the clinical scale scores on the MMPI-168. Four variables entered into the function: the Psychopathic Deviation scale, the Paranoia scale, the Psychasthenia scale, and the Schizophrenia scale. An eigenvalue of .19 and a chi-square value (4, N =39) of 5.99, p = .2001, was obtained, clearly indicating a non-significant function. This discriminant function correctly classified 56.41% of the subjects regarding their actual successes with treatment.

Results of the statistical procedures used to test hypotheses 7, 8, 9, 10, 11, and 12, the hypotheses regarding the possible relationship among predictor variables and satisfaction with treatment, were considered invalid due to the small sample of dissatisfied subjects (n = 5).

The statistical procedures used to test hypotheses 13, 14, 15, and 16, the hypotheses used to examine possible differences on the DSI vari-

ables and on the clinical scale scores on the MMPI-168 between subjects who rate success of treatment less than their doctors and subjects who rate success of treatment equal to or higher than their doctors, revealed no significant findings. In addition to these procedures, a Pearson's r correlation coefficient was computed to see if there was a linear relationship between patients' ratings of success and doctors' ratings of success (r =.53, p < .01).

A Kruskal-Wallis one-way analysis of variance was used to test hypothesis 17, that there are no differences on the DSI variables regarding previous medical and dental experiences between subjects who rate satisfaciton with treatment higher than success of treatment and subjects who rate satisfaction with treatment equal to or lower than success of treatment. This test revealed significantly different mean ranks for subjects who rated satisfaction with treatment equal to or lower than success of treatment (mean rank = 22.07, n = 21) and subjects who rated satisfaction with treatment higher than success of treatment (mean rank = 14.97, n = 10) for the DSI variable regarding patients' previous medical treatments for pain other than dental pain. The subjects who were equally as satisfied or less satisfied with treatment than they were successful with treatment had, on the average, more previous medical treatment for pain other than dental pain than subjects who were more satisfied than successful with treatment. A chi-square value (corrected for ties) of 5.40, p < .05, was found to be significant.

The Kruskal-Wallis test also indicated significantly different mean ranks for the DSI variable regarding patients' previous bad experiences with dentists for subjects who rated satisfaction with treatment

equal to or lower than success of treatment (mean rank = 22.14, n = 21) and subjects who rated satisfaction with treatment higher than success of treatment (mean rank = 16.24, n =17). The subjects who were equally as satisfied or less satisfied with treatment than they were successful with treatment had, on the average, more bad experiences with dentists than subjects who were more satisfied than successful with treatment. A chi-square value (corrected for ties) of 4.30, $p < .05$, was found to be significant. In addition, to see if there was a linear relationship between patients' ratings of satisfaction with treatment and patients' ratings of success of treatment, a Pearson's r correlation coefficient was calculated ($r = .36$, $p < .05$). This calculation revealed a moderate correlation between the two ratings.

The statistical procedures used to test hypotheses 18, 19, and 20, the hypotheses used to examine the possible differences in clinical scale scores on the MMPI-168 regarding expectations from treatment and interpersonal styles, between subjects who rated satisfaction with treatment higher than success of treatment and subjects who rated satisfaction with treatment equal to or lower than success of treatment, revealed no significant findings.

Profile Validity

The F-K index is used to identify unreliable MMPI test profiles. This index is calculated by subtracting a subject's score on the K scale from his or her score on the F scale. Several authors have suggested a cutoff score of +11 to reveal "fake bad" profiles and a cutoff score of -11 to reveal "fake good" profiles. The cutoff score of -11 has been quite effective in helping discern profiles of subjects who are conceal-

ing maladjustments, but it has tended to pick up a high proportion of honest profiles as well. It seems that more research is needed before a cutoff score to detect "fake good" profiles can be practically serviceable (Gough, 1956; Graham, 1977).

In this study, 12 out of the 39 subjects who completed the MMPI-168 had F-K index scores below the -11 "fake good" cutoff score. Additional statistical analyses were undertaken to see if these subjects differed in any way from the rest of the subject population. A one-way analysis of variance was conducted to see if the subjects who had valid MMPI-168 test profiles (according to the +11 and -11 cutoff scores) had significantly different means on their MMPI-168 clinical scale scores than subjects who had invalid test profiles. The analysis of variance indicated that these two samples significantly differed on their mean scores on the Depression scale, F (1, 39) = 7.22, $p < .05$. Subjects with valid test profiles had a mean score of 61.37 and subjects with invalid test profiles had a mean score of 51.42. These two groups also significantly differed on the Mania scale, F (1, 39) = 7.02, $p < .05$. Subjects with valid test profiles had a mean score of 62.78 and subjects with invalid test profiles had a mean score of 53.08. These results indicated that 31% of the subjects in this study may have "faked good" on the MMPI-168, especially on the Depression and the Mania scales. This finding suggests that these subjects may also have completed the other questionnaires used in this study dishonestly, casting doubt on the validity of the data collected.

In addition to the statistical procedures described above, a one-way analysis of variance was conducted to see if the subjects who had valid MMPI-168 test profiles had significantly different mean levels of

success than subjects who had invalid test profiles. This procedure revealed no significant findings.

CHAPTER V

DISCUSSION

Results

The results of this study indicate several variables that differentiate successful and unsuccessful subjects. The first variable that differentiates these two groups is the amount of medical treatment that patients had for pain other than dental pain. Subjects in this study who were successful with treatment had, on the average, more previous medical treatment for pain other than dental pain than subjects who were unsuccessful with treatment. This finding is somewhat surprising because the literature indicated that unsuccessful subjects often have had many previous unsuccessful medical treatments for facial and other pains (Feinman et al., 1984; Lipton & Marbach, 1984). One explanation for this is that although these subjects had many previous treatments for pain, their treatments were generally successful rather than unsuccessful. If these subjects had many successful experiences dealing with pain they may have learned skills of pain management that helped them to succeed with their present treatment for TMJ pain and dysfunction. Also, these subjects may have entered treatment expecting that it would help them based on their previous medical experiences. Their positive outlooks on treatment may have contributed to their successes with it.

Another possible explanation for the successful responses of the subjects in this study who have had a large number of medical treatments for pain is that these particular patients may have developed a somatiz-

ing style of coping with the stress in their lives. These subjects may consistently seek medical treatment for what were originally psychological needs. Because psychological factors play a role in the remission of TMJ symptoms, the medical treatment these subjects received for their TMJ pain may have been successful due to the placebo effect (Greene et al., 1982).

The results of this study indicate that these subjects also are not as satisfied with treatment as they are successful with it. One possible explanation for this is that because these subjects seem to have established a pattern of seeking medical help for their emotional needs, they may continue to seek treatment for new pains in other parts of their bodies soon after they successfully complete one medical treatment. Each treatment these patients receive may relieve them of their present physical pain and thus be successful, but the patients' psychological needs which contributed to their developing the pains and which motivated them to seek treatment are not completely satisfied. So, these subjects might be clinically successful with the different treatments, but they are often not as satisfied with them. The results of this study indicate that although these subjects were equally as satisfied or less satisfied with TMJ treatment than they were successful with it, there was not a large difference between the two ratings.

Another variable that differentiated successful and unsuccessful subjects in this study was subjects' expectations from treatment. The literature suggests that patients with unrealistically high expectations from treatment are not successful with treatment. The findings of this study indicate that in regards to two variables concerning expectations from treatment, the greater subjects' expectations the more successful

they are with treatment. The findings indicate that the more subjects expect that treatment will take away their difficulties in closing their mouths and the more they expect that treatment will enable them to be less irritable, the more successful they will be with treatment. This finding does not contradict the findings cited in previous studies because although these subjects have high expectations from treatment, their expectations do not seem unrealistic. It seems realistic for these subjects to expect that treatment will take away all of their difficulties in closing their mouths. Subjects' expectations that treatment will help them with their difficulties in being irritable can also be realistic as these difficulties can be directly related to their TMJ problems as well. It seems likely that a person with TMJ problems who is physically uncomfortable or who has difficulty eating would be irritable. In this way, it is realistic for a TMJ patient to expect that his or her difficulties in being irritable will be helped by treatment. It is also possible that the more subjects think that treatment will help them the more that it will; subjects' attitudes can contribute to the success of treatment. This may be particularly true with subjects' expectations of how treatment will affect them emotionally, for example, if they think it will help them be more tolerable.

Another variable that differentiates subjects who are successful with treatment and subjects who are unsuccessful with treatment is subjects' self-ratings of how often they closely follow directions. Subjects who are successful with treatment, on the average, report they more often closely follow directions than subjects who are unsuccessful with treatment. This finding seems to indicate that subjects who are more likely to comply with their doctors' suggestions are more likely to

be successful with treatment. There are several factors that can contribute to subjects' degrees of compliance with treatment: their attitudes towards an authority figure such as a dentist, past experiences when they complied to doctors' suggestions, and their attitudes towards the doctors offering treatment, for example, whether or not they like and trust the doctors. Because dentists are trained to treat patients and relieve them of their suffering, it seems to make sense that patients who are successful with treatment are patients who comply with their doctors' recommendations.

One goal of this study was to determine if the MMPI-168 could differentiate successful and unsuccessful TMJ subjects and if it could predict subjects who would be unsuccessful with treatment. In a previous study Schwartz et al. (1979) stated that the neurotic triad scale scores on the MMPI are good predictors of TMJ treatment response. The results of the present study indicated that no one scale on the MMPI-168 could predict treatment response, nor could the combined score of the first three scales which comprise the neurotic triad. One possible explanation for these different results is the number of possibly invalid MMPI-168 profiles collected from the subjects in this study. As mentioned earlier, 31% of the subjects in this study gave possible invalid profiles. The large percentage of subjects who "faked good" on the MMPI-168, who consciously or unconsciously tried to appear as if they had no emotional difficulties, seems to support Moulton's (1955) observation that TMJ patients often emphasize their psychological strengths and deny weakness of any kind. The subjects who gave invalid profiles in this study may have particularly "faked good" on the Depression and the Mania scales, masking any depressive or manic symptoms they had.

Because these subjects seemed to "fake good" on the Mania and Depression scales, if they had been more honest in completing the MMPI-168, it is possible that they would have scores highest on these two scales. Dahlstrom, Welsh, and Dahlstrom (1972) noted that in both normal and psychiatric populations, subjects frequently score highest on these two scales, though the scales seem to be contradictory. These authors stated that the manic features of these subjects are the most prominent features and they serve to hide subjects' depressive states from not only other people, but also from the subjects themselves. Guthrie's study (cited in Dahlstrom et al., 1972) indicated that medical patients who scored highest on these two clinical scales looked tense and anxious but they did not look depressed. The tenseness was sometimes related to upper gastrointestinal compaints or to fatigue. The depression and anxiety that co-exists in these patients seem similar to the traits that characterize atypical depression. As mentioned earlier, atypical depression is the most common psychiatric diagnosis for TMJ patients. One might speculate that if these subjects were more honest in completing the MMPI-168, their Depression and Mania scales may have been significantly elevated and may have differentiated successful and unsuccessful subjects. The fact that these subjects consciously or unconsciously tried to look good on these scales may indicate that they are truly maladjusted in these areas. However, the results of this study indicate that the MMPI-168 is not a good predictor of subjects' success with treatment. The large percentage of possible invalid profiles in this study suggests that there is some doubt about the claims of other studies that the MMPI is a useful predictor of treatment outcome for TMJ patients. More research is needed pertaining to the valid-

ity of TMJ subjects' MMPI test scores.

One interesting finding of this study that supports Greene and Laskin's (1983) results is that most of the subjects in the study were satisfied with treatment, even though 17 of the 38 subjects who rated treatment said they felt treatment was unsuccessful. One might expect that more of these unsuccessful subjects would say they were dissatisfied with treatment. There are several possible explanations for this finding. One explanation is that these patients tried to relieve the cognitive dissonance they experienced due to the amount of time, energy, and money they devoted to what they believed was unsuccessful treatment by saying they were satisfied with the services provided. Another reason these patients may have said they were satisfied is that they felt dependent on their dentists and did not want to risk being rejected by them by saying they were not happy with the treatment these dentists provided. This explanation may support Moulton's (1955) observation that many TMJ patients are excessively dependent, pleading, and ingratiating. They may be less likely to express dissatisfaction with treatment because they do not want to bring themselves into the disfavor of others, especially the dentists who are providing treatment. Because only one general item on the Patient Evaluation Form was used to measure subjects' levels of satisfaction with treatment, it is possible that more subjects were dissatisfied than the results indicated. If patients were asked more specific questions about what they were and were not satisfied with regarding the treatment provided at the center, more patients may have expressed dissatisfaction with treatment.

The results of this study indicate that there are no significant differences between subjects who rate the success of treatment less than

their dentists and subjects who rate the success of treatment equal to or higher than their dentists. It was anticipated that the patients who thought treatment was less successful than their dentists did would have high expectations from treatment that included relief from psychological as well as physical pain and that they would have very different goals for treatment than their dentists. It was also anticipated that these patients would have adopted a somatizing lifestyle and therefore would have had many previous treatments for pain. None of the predictor variables in this study differentiated between the two groups of subjects described above. In addition, the statistical analysis revealed a linear relationship between subjects' ratings of success of treatment and doctors' ratings of success of treatment. Patients' and doctors' ratings may have been similar because the individuals in both groups had the same goals for treatment and perceived the progress of treatment in similar manners. If this is true, then most of the subjects in this study were probably not somatizers as anticipated. However, it is also possible that the subjects' and the doctors' ratings of the success of treatment correlated because the doctors' evaluations of treatment were largely based on the reports they received from patients regarding whether or not treatment was helping them get rid of their pain and dysfunction.

Another goal of this study was to see if there were any variables that differentiated subjects who rated satisfaction with treatment higher than success of treatment and subjects who rated satisfaction with treatment equal to or lower than success of treatment. It is possible that subjects who were not as satisfied as they were successful with treatment would have entered treatment for psychological as well as

physical needs, so medical treatment might satisfy their physical needs and thus be clinically successful, but it would not meet their psychological needs so they would not say that they were satisfied with it. As explained earlier in this chapter, this would explain the large amount of previous treatments these subjects had for pain other than dental pain. It is also possible that these subjects were not as satisfied as they were successful with treatment because they did not feel the services provided by the TMJ center were as good as the many other medical services they had been exposed to previously. These patients may have believed that treatment was successful but that the efficiency of the clinic and the quality of care it provided were not as good as some of the other medical services they had used.

The results of this study also indicate that subjects who are less than or equally as satisfied with treatment as they are successful with it have had more bad experiences with dentists than subjects who are more satisfied than successful with treatment. The less satisfied patients may have acquired a fear of dentists or dental anxiety based on their negative experiences with dentists. They may have learned that dental experiences are not pleasant so even if dental treatment relieves them of their pain, they still view it as a negative experience and express dissatisfaction with it.

Although the statistical analysis revealed two variables that differentiated subjects who were less than or equally as satisfied with treatment as they were successful with treatment and subjects who were more satisfied than successful with treatment, it is important to note that there was a linear relationship between subjects' ratings of success of treatment and subjects' ratings of their satisfaction with

treatment; there was not a large discrepancy between these two ratings.

Clinical Implications

There are many steps that dentists or health care professionals can take to make TMJ treatment more effective based on the findings of this study. It is important that these professionals understand the influence of the psychological characteristics of the TMJ patient population on treatment outcome. Some TMJ patients have pain with an organic basis and others do not, but in either case it seems possible that some patients who enter TMJ treatment will be somatizers who seek medical treatment because they use their bodies, probably unconsciously, for personal or psychological gain. It is crucial for dentists to realize that TMJ patients seek treatment for a variety of reasons. Some seek treatment for relief of physical pain and dysfunction and others seek treatment mainly for emotional support. Because of this, dentists will not be able to provide effective treatment for many of their patients if they only concentrate on trying to relieve patients of their dental pain through medical treatment based on scientific principles. The psycholgical needs of many TMJ patients and the fact that treatment is attempting to take away pain, a subjective experience, make it very important that dentists not only provide medical treatment based on scientific principles, but also that they be aware of patients' psychological states and the significant role they have in treatment outcome. These dentists may need to tailor treatment to the specific physical and emotional needs of each patient if they want to provide effective treatment.

One way that dentists can help patients be more successful with

treatment is by talking to them about any past experiences they have had in successfully dealing with pain of any kind. The dentists can ask the patients if they learned any skills or methods of pain management that might be of use to them now in coping with their TMJ pain. In asking the patients this question, the dentists will be reminding them that they have resources that can help them to manage their present pain. This technique also reminds patients that they successfully dealt with pain in the past and they have the ability to deal with it again.

Since dental anxiety can interfere with the success of TMJ treatment and patients' satisfaction with treatment, dentists need to know how to deal with it. It seems likely that patients will be less frightened of dentists and the dental procedures if they trust their dentists and have good relationships with them. However, a positive doctor-patient relationship may take time to develop and there are at least a few things that dentists can do in the beginning of treatment to relieve some of the anxiety their patients may feel. Richardson (1936) suggested that dentists try to take patients' minds off of the dental procedures by talking to them about anything other than dentistry and by decorating their offices in a pleasant and interesting manner. He suggested that dentists not talk to patients about dental anxiety or fear unless patients bring it up; this only invites patients to focus on their anxieties. If a patient speaks about being nervous or uncomfortable with the dental procedures the dentist should listen to the patient and try to be as understanding and reassuring as possible.

The importance of the doctor-patient relationship on treatment success has been pointed our several times throughout this paper. It is important that dentists try to support their patients emotionally and

encourage their patients to trust them. If a dentist chooses to speak to a patient about the patient's style of coping with stress, a factor that may influence TMJ pain, he or she needs to be very careful not to patronize the patient but to gently explain that people have different ways of reacting to and coping with stress, and that he or she may have unconsciously adopted a way that creates dental pain, like, for example, jaw clenching or grinding the teeth. It is important that dentists try to form a good relationship with each patient mainly because of the success of placebo treatments with TMJ patients; response to placebos is greatly influenced by the doctor-patient relationship. Also, if patients like and trust their dentists they will be more likely to follow the treatment plans the dentists give them, which will affect the outcome of treatment. Some TMJ patients may have difficulties in interpersonal relationships and may find it difficult to communicate to their dentists. They may have a hard time telling the dentists exactly what their symptoms are and what they want from treatment. When this occurs, the dentists can ask the patients specific questions to help them communicate their problems and needs to the dentists. This may also help the patients feel that the dentists care enough to want to know more about them. The importance of the doctor-patient relationship in TMJ treatment cannot be stressed enough. Dentists also need to pay close attention to any strong feelings they have about particular patients. For example, a dentist may get frustrated or angry at a patient whose symptoms have increased during treatment or who blames the dentist for his or her dental problems. Dentists need to be aware of the possible psychological problems of their patients so the chances of them reacting to their patients in an unprofessional or less than understanding manner

will be reduced.

To increase the chances for successful treatment dentists also need to ask their patients how they think that treatment will help them. This will help the dentists become aware of any unrealistic expectations patients may have so the dentists can help the patients form more realistic goals for treatment. The results of this study indicate that it is helpful in some instances for patients to have realistic and high expectations from treatment. If dentists become aware that patients have extremely low expectations from treatment they can tell the patients how treatment may be able to help them and raise their goals for treatment. This will encourage patients to have a more positive outlook on treatment and it may help them gain trust in the dentists.

Previous studies indicated that many TMJ patients suffer from depression and anxiety. Although this was not verified in this study, the experimental findings suggest that some TMJ patients consciously or unconsciously mask their depression and anxiety. As these emotional difficulties may get in the way of treatment and may have motivated these patients to seek treatment in the first place, it is important that dentists who treat TMJ patients be knowledgeable about depression and anxiety and be aware of any symptoms these patients may exhibit regarding them. If possible, dentists should take the time to listen to anything patients want to talk about, especially in the beginning of treatment, so they can learn more about patients' attitudes toward their TMJ pain and more about their lifestyles in general. It may be helpful diagnostically for dentists to ask patients if they experience a good deal of stress in their lives and how they feel about their lives in general. If dentists choose to do this, they need to ask these ques-

tions in a gentle and non-intrusive way. It seems that dentists would be able to provide more effective treatment that would meet the specific needs of each patient once they got to know each patient better. If dentists suspect that patients have emotional difficulties that are related to their TMJ pain and that can be treated by a mental health professional, the dentists may want to refer the patients to a qualified psychotherapist. Often, this referral will be made in conjunction with the offer to continue the medical treatment. Dentists need to be extremely careful about who they refer patients to and how they actually make the referral to the patients. This needs to be done in a gentle, reassuring, and non-intrusive manner. The dentists must realize that many of these TMJ patients will probably not accept the referral for psychological help because TMJ patients often try to maintain self-concepts of normalcy and psychological strength; going to a psychotherapist would be an admission of emotional problems.

In order for TMJ treatment to be successful the dentists who provide treatment must be aware of the kinds of patients with whom they are working. They need to know that most of their patients will probably say they are satisfied with treatment if asked, even though some of them are probably not satisfied. They also need to know that TMJ patients seek treatment for a variety of reasons. At least a small sample of them are probably seeking medical attention for psychological difficulties. The dentists should expect that these patients may be difficult to treat and that they may sometimes react to the dentists in a highly emotional manner that reflects the patients' own psychodynamics. The dentists must realize that these patients will require more patience, time, and attention than other TMJ patients and that they can succeed

with treatment if given proper medical and/or psychological care.

Limitations of the Present Study

There are several possible limitations of this study. These limitations may have made it difficult for the study to test the hypotheses it was designed to and they may have influenced the experimental findings in a way that makes them questionable.

One limitation of the study is that it was conducted using 40 subjects. This small sample size limited the kinds of statistical procedures that could be used to analyze the data. It also may have influenced the statistical procedures that were used in this study and affected whether or not the results of these procedures were significant. Because the results of this study were based on a relatively small number of subjects, it is difficult to make any kind of generalizations about TMJ patients using them.

Another limitation of this study is the high number of possible invalid MMPI-168 profiles. Since a large percentage of TMJ subjects in this study may have "faked good" on their MMPI-168 profiles, it is also possible that they completed the other questionnaires used in this study dishonestly. It is possible that these patients also "faked good" and tried to conceal any emotional difficulties they had on the DSI and the Patient Evaluation Form as well. For example, these patients may have been less likely to report any problems they had in relating to other people as measured by the interpersonal style variables on the DSI. Because these subjects may not have completed the MMPI-168 honestly, it is possible that they did not honestly complete the DSI and the Patient Evaluation Form either. The results of this study revealed a linear

relationship between subjects' ratings of the success of treatment and doctors' ratings of the success of treatment. This may indicate that patients were honest in their evaluations of treatment because their evaluations were similar to the dentists' objective evaluations. However, this may not be the case because, as mentioned earlier, the dentists' ratings might be based on what the patients tell them regarding the success of treatment. Although the results of this study suggested that 31% of the subjects had invalid MMPI-168 profiles, Gough (1956) and Graham (1977) stated that more research is needed before a cutoff score to detect "fake good" profiles can accurately be used. Perhaps a projective test such as the Rorschach or a semi-structured psychiatric interview would be better at assessing TMJ patients' personalities than the MMPI-168.

This study was the first study to use the DSI, the Patient Evaluation Form, and the Doctor Evaluation Form. One limitation of this study is that many of the predictor variables in the study and the dependent variables in the study (i.e., success of treatment and satisfaction with treatment) were measured using these new protocols whose validity and reliability had not yet been investigated.

Another possible limitation of this study is that patients' expectations of treatment were measured after treatment had already begun. All subjects in this study had been in treatment at the TMJ and Facial Pain Center for at least 6 months because the dentists at the center felt that this was the minimum amount of time that patients needed to be in treatment in order for them to evaluate the success of treatment. Since patients evaluated the success of treatment and their expectations from treatment at the same time, patients' expectations of treatment

were measured after they had been in treatment for at least 6 months. Patients may have reported what they remembered they expected from treatment when they first began or they may have reported what they still expected from treatment after being in treatment for 6 months since all of them continued treatment after participating in this study. In either case, these ratings may have been different than the ratings patients would have given at the beginning of treatment.

Another limitation of this study is that only one item on the Patient Evaluation Form was used to measure subjects' success with treatment and one item on the Patient Evaluation Form was used to measure subjects' satisfaction with treatment. Success and satisfaction with treatment probably could have been measured more accurately if subjects were asked about them in a few different ways. It is possible that subjects could have interpreted the two items used to measure success and satisfaction in a different way than they were intended. Also, a more accurate account of subjects' evaluations of treatment may have been collected if subjects were asked to evaluate treatment using an open-ended question instead of a 5-point Likert scale.

These limitations must be taken into account when analyzing the experimental findings of this study.

Directions for Future Research

The results of this study indicate that more research is needed on the validity of TMJ subjects' MMPI test profiles. Perhaps a larger sample of TMJ subjects can be administered this test to see if the large percentage of invalid profiles in this study was a coincidence or whether it was indicative of the inappropriate use of the MMPI-168 with

TMJ patients. If there continues to be a large number of invalid profiles, future studies should use alternative personality assessment techniques to examine the relationship between depression, anxiety, and success or satisfaction with treatment.

Since a number of items on the DSI differentiated successful and unsuccessful subjects and described the relationship between success of treatment and satisfaction with treatment, future studies can use a modified version of the DSI to try to predict patients' success and satisfaction with treatment. Only the items on this questionnaire that produced significant results in the present study should be retained. Also, additional questions should be added to the DSI regarding the details of patients' previous medical and dental experiences. This modified version of the DSI should be redistributed to a new sample of TMJ subjects when they begin treatment to see if the items used in the original DSI can predict success of treatment and if the new items can differentiate successful and unsuccessful subjects.

Future studies concerning the outcome of TMJ treatment need to assess patients' success of treatment and patients' satisfaction with treatment in a more detailed manner. This will require subjects to do more than rate two items on a 5-point Likert scale. Perhaps subjects can also complete a checklist of the possible things they are satisfied or dissatisfied with concerning treatment and the ways in which they think treatment is successful or unsuccessful. Patients can also be asked to write a short paragraph telling the researcher why they feel treatment is successful or unsuccessful and what specifically they are satisfied and dissatisfied with concerning the treatment they reveive. Future research on the outcome of TMJ treatment should be based on

detailed evaluations so that more can be learned about the factors that influence patients' success of treatment and patients' satisfaction with treatment.

Summary

There appears to be several variables that can be evaluated by the DSI that may be able to predict TMJ patients who will be successful with treatment and TMJ patients who will be unsuccessful with treatment. These variables are the amount of medical treatment that patients have had for pain other than dental pain, patients' expectations from treatment regarding their difficulties in closing their mouths and their levels of irritability, and patients' self-reports of how often they closely follow directions. Although most of the subjects in this study were satisfied with treatment, there are a few variables that may also be able to predict those subjects who will not be as satisfied with treatment as they are successful with treatment. These variables are the amount of medical treatment that patients have had for pain other than dental pain and the amount of bad experiences that patients have had with dentists. Special care and attention may be needed when planning treatment strategies for the patients who these variables predict will be unsuccessful or dissatisfied with treatment. Additional studies with a new sample of subjects are needed to verify the predictive value of the variables isolated in this study. Finally, this study indicates that the MMPI-168 is not a good predictor of treatment success. Future research needs to focus on the validity of TMJ subjects' MMPI test profiles.

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APPENDIX A

Dental Screening Inventory

Richard Rogers, Ph.D.

Please complete this Dental Screening Inventory which will provide your doctors and myself with useful information about patients in treatment for Temporomandibular Joint Dysfunction (TMJ). This information is being gathered on every patient in treatment for TMJ to increase our understanding of the problems which often occur. This information will have no bearing on your treatment whatsoever. It will, in fact, not be reviewed until after treatment is completed. Please answer as honestly and completely as possible.

Background Information

Name _____ Age _____ Sex _____ Race _____

Marital Status _____ Years of Education _____

Telephone Number _____

Best Time You Can Be Reached _____

Home Address _____

Medical-Dental Synopsis

1. Previous medical treatment for major illness or accident:
   No ____ Yes ____ If yes, what was done?

   _____

2. Were there any complications?
   No ____ Minor complications ____ Major complications ____

3. Previous dental treatment other than routine check-ups:
   No ____ Yes ____ If yes, what was done?

   _____

4. Were there any complications?
   No ____ Minor complications ____ Major complications ____

5. Previous medical treatment for pain other than dental pain:
   No ____ Yes ____ If yes, what was done and where was the pain located in your body?

   _____

6. Have you received any treatment for your TMJ symptoms prior to coming to this clinic?
No ____ Yes ____ If yes, what was done?

_____

7. Have you ever had any "bad experiences" with dentists in the past?
No ____ Yes ____ If yes, what happened?

_____

8. How would you describe your feelings toward dentists in general?
Circle one:

1	2	3	4	5
very positive	positive	neutral	negative	very negative

9. Please describe your current dental problems.

_____

_____

_____

To What Extent Does This Describe You?

Please rate the difficulties that you experience now (including the last several months) and what you expect to experience after completing treatment.

Use the following ratings:

0 No problem or difficulty
1 Slight problem or difficulty
2 Moderate problem or difficulty
3 Major problem or difficulty

Problems with Pain

	Now	After	
F1.	____	____	Headaches
F2.	____	____	Earaches
F3.	____	____	Jaw Pain
F4.	____	____	Unnecessary jaw noises (clicking)
F5.	____	____	Dizziness

Problems with Eating

	Now	After	
F6.	____	____	Biting
F7.	____	____	Chewing
F8.	____	____	Swallowing
F9.	____	____	Lack of neatness while eating
F10.	____	____	Must avoid certain foods

Problems with Speaking

	Now	After	
F11.	____	____	Speaking clearly
F12.	____	____	Trouble breathing while talking
F13.	____	____	Voice sounds different

Use the following ratings:

0 No problem or difficulty
1 Slight problem or difficulty
2 Moderate problem or difficulty
3 Major problem or difficulty

Problems with Facial Expressions

	Now	After	
F14.	____	____	Trouble smiling
F15.	____	____	Difficulty closing mouth
F16.	____	____	Trouble exressing anger
F17.	____	____	Unnecessary jaw and lip movements
F18.	____	____	"Frozen" or unchanging expression
F19.	____	____	Look unintelligent

Social Problems: To what extent do your dental problems...

	Now	After	
S1.	____	____	Hurt your attractiveness
S2.	____	____	Detract from your facial appearance
S3.	____	____	Detract from your sexual attractiveness
S4.	____	____	Make you more noticeable to others
S5.	____	____	Make you feel different from others
S6.	____	____	Make you self-conscious
S7.	____	____	Make you easily embarrassed
S8.	____	____	Make you afraid of new people
S9.	____	____	Make you tend to hide face or mouth
S10.	____	____	Make you fearful of being ignored
S11.	____	____	Make others be more cautious around you
S12.	____	____	Make you fearful of being snubbed

Use the following ratings:

0 No problem or difficulty
1 Slight problem or difficulty
2 Moderate problem or difficulty
3 Major problem or difficulty

Personal Issues: To what extent are you...

	Now	After	
P1.	____	____	Self-critical
P2.	____	____	Possessing very high self-standards
P3.	____	____	Accepting of one's fate
P4.	____	____	Worried in general
P5.	____	____	Worried about health
P6.	____	____	Worried about appearance
P7.	____	____	Discouraged about your future
P8.	____	____	Moody
P9.	____	____	Irritable (have a chip on your shoulder)
P10.	____	____	Lonely
P11.	____	____	Stubborn
P12.	____	____	Caught up in routines
P13.	____	____	Often feeling confused
P14.	____	____	Putting problems off
P15.	____	____	Having strange or unusual thoughts
P16.	____	____	Using recreational drugs
P17.	____	____	Having your thoughts race
P18.	____	____	Having mood swings
P19.	____	____	Having thoughts about death
P20.	____	____	Having visions
P21.	____	____	Feeling restless
P22.	____	____	Getting little satisfaction from life

Please rate yourself on the following items.
Use the following ratings:

0 Never
1 Seldom
2 Sometimes
3 Frequently

Interpersonal Style: To what extent do you...

I1. ____ Follow the lead of others

I2. ____ Dislike authority

I3. ____ Like arguments

I4. ____ Listen to professionals

I5. ____ Enjoy a good argument

I6. ____ Threaten legal action in a conflict

I7. ____ Become competitive with others

I8. ____ Form your own opinion

I9. ____ Like to be in charge

I10. ____ Closely follow directions

I11. ____ Attempt to please others

I12. ____ Use excuses to avoid conflict

I13. ____ Suspect other's motives

I14. ____ Expect too much from others

I15. ____ Look for guidance from others

I16. ____ Backoff from disagreements

I17. ____ Give lip service to others

I18. ____ Feel intolerant of incompetence

I19. ____ Like to be in control

I20. ____ Have a sense of humor

I21. ____ Pay attention to details

I22. ____ Dislike surprises

I23. ____ Often have strong opinions

I24. ____ Find fault

P23. ____ ____ Competitive

P24. ____ ____ Having "crazy" ideas

P25. ____ ____ Feeling unreal

APPENDIX B

Your Name _____

Today's Date _____

Please fill out this evaluation and return it to the secretary along with the other forms given to you. If for any reason any of these categories does not fit for you, please leave the category blank and indicate why this is the case on the space provided under each category for comments.

A. At the present time please rate your comfort level in terms of TMJ symptoms.

circle one

5 extremely comfortable

4 somewhat comfortable

3 neutral

2 somewhat uncomfortable

1 extremely uncomfortable

comments:_____

B. Since beginning treatment has your ability to function in light of your TMJ symptoms:

circle one

5 improved considerably

4 somewhat improved

3 not changed at all

2 somewhat declined

1 declined considerably

comments:_____

C. Please rate your overall level of satisfaction with the treatment given at the clinic.

circle one

5 extremely satisfied

4 somewhat satisfied

3 no opinion at all

2 somewhat dissatisfied

1 extremely dissatisfied

comments:_____

Thank you very much for your help. Your cooperation and assistance in this research project is greatly appreciated.

APPENDIX C

Patient's Name _____

Today's Date _____

Doctor or Resident:

Please fill out this evaluation after today's appointment with the patient. When it is completed, return the form to the secretary. If for some reason any one of these categories does not fit your perception of this particular patient, please leave the category blank and indicate why this is the case on the space provided under each category for comments.

A. At this point in treatment, the patient's ability to function in light of his or her TMJ symptoms has:

circle one

5 improved considerably
4 somewhat improved
3 not changed at all
2 somewhat declined
1 declined considerably

comments:_____

B. At this point in treatment, the patient's range of motion in terms of his or her TMJ symptoms has:

circle one

5 improved considerably
4 somewhat improved
3 not changed at all
2 somewhat declined
1 declined considerably

comments:_____

C. At this point, the patient's presenting symptom(s) have:

circle one

5 disappeared completely
4 decreased somewhat in intensity
3 remained the same
2 increased somewhat in intensity
1 significantly increased in intensity

comments:_____

Thank you very much for your help. Your cooperation and assistance in this research project is greatly appreciated.

APPENDIX D

University of Illinois at the Medical Center
Institutional Review Committee, Graduate College

ADULT'S CONSENT FOR PARTICIPATION IN AN EXPERIMENTAL PROJECT

(Please complete the following statements in the first person and in lay language)

1. I _____ state that I am _____ years of age and I wish to
(Type or print subject's name)
participate in a program of medical research being conducted
by: Ronni Barnes
(Physician/investigator)

2. The purpose of the research is: to increase the understanding of psychological factors as they relate to the effective treatment of TMJ symptoms.

3. The experimental procedures are: completion of two paper-and-pencil protocols, the Dental Screening Inventory and the MMPI-168, and completion of a brief form questioning me about the success of treatment and my overall satisfaction. I also give permission to review my patient file for diagnostic and treatment information.

4. The personal risks involved are (if none, so state):

There are no negative consequences anticipated as a function of my participation in this study.

5. I understand that I will receive standard medical care, if required, even if I do not participate in this study. Alternative procedures and therapy which might benefit me personally are:

Since this study is completely optional and in no way affects my treatment, I will receive available dental services regardless of my participation.

6. I understand and accept the following research related costs (this refers to costs which are beyond those required for my normal diagnostic and treatment purposes). If no additional research costs are to be paid by the patient/subject state NONE.

NONE

7. COMPENSATION STATEMENT (Check appropriate statement).

__X__ a. I understand that in the event of physical injury resulting from this research there is no compensation and/or payment for medical treatment from the University of Illinois at the Medical Center for such injury except as may be required of the University by law.

_____ b. I understand that in the event of physical injury resulting from this research, compensation and/or medical treatment may be available from _____ Corporation (who is sponsoring this research). I understand that if I believe that I am eligible for compensation or medical treatment, I may contact:

_____ Name

_____ Address

_____ Phone of sponsoring company

However, there is no compensation and/or payment for medical treatment from the University of Illinois at the Medical Center for such injury except as may be required of the University by law.

8. ADULTS CONSENT (a. will apply unless b. is checked).

__X__ a. I acknowledge that I have been informed that this procedure is not involved in my treatment and is not intended to benefit my personal health.

_____ b. I acknowledge that I have been informed that this procedure is also designed to assist in maintaining or improving my personal health and will benefit me personally in the following way:

I acknowledge that Ronni Barnes (Physician/investigator) has explained to me the risks involved and the need for the research; has informed me that I may withdraw from participation at any time and has offered to answer any inquiries which I may make concerning the procedures to be followed. I freely and voluntarily consent to my participation in this project.

I understand that I may keep a copy of this consent form for my own information.

X _____ _____
Volunteer (Sign & Date) (Type Name)

X _____ _____
Physician/investigator (Sign & Date) (Type Name)

X _____ _____
Witness of Explanation to Volunteer by PI (Sign & Date) (Type Name)

APPROVAL SHEET

The thesis submitted by Ronni M. Barnes has been read and approved by the following Committee:

Dr. Kevin J. Hartigan, Director
Assistant Professor, Counseling Psychology and Higher Education, Loyola University of Chicago

Dr. Steven D. Brown
Associate Professor, Counseling Psychology and Higher Education, Loyola University of Chicago

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

February 6, 1986
Date

Kevin J. Hartigan
Director's Signature