Physical Therapists' Perceptions Concerning the Determination of Fibromyalgia Interventions: A Qualitative Study

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PHYSICAL THERAPISTS' PERCEPTIONS CONCERNING THE DETERMINATION OF FIBROMYALGIA INTERVENTIONS: A QUALITATIVE STUDY

By

Elizabeth Jayne Levengood

THESIS

Submitted to the Physical Therapy program
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2001
ABSTRACT

PHYSICAL THERAPISTS' PERCEPTIONS CONCERNING THE DETERMINATION OF FIBROMYALGIA INTERVENTIONS: A QUALITATIVE STUDY

By

Elizabeth Jayne Levengood

This qualitative explored some of the concepts under which physical therapists in the Grand Rapids, Michigan area operate when treating patients with fibromyalgia syndrome. Four physical therapists with at least two years' experience working in local pain clinics were interviewed. The data were transcribed, coded, and analyzed into themes. Seven categories of physical therapists' perceptions concerning the determination of interventions were developed: (a) Factors affecting decision-making, (b) physical therapeutic interventions, (c) decision-making in the absence of intervention guidelines, (d) judgments of effectiveness according to clinical findings, (e) judgments of effectiveness through consultation, (f) perceptions of intervention decisions, and (g) perceptions of provision of care. Two factors affected physical therapists' decision-making and perceptions of their decision-making effectiveness: (a) Beliefs about fibromyalgia syndrome and (b) professional and personal experience. Physical therapists' believed fibromyalgia syndrome to be a poorly diagnosed, complex disease involving psychological factors, physical factors, and specific patient personality traits.
DEFINITION OF TERMS

1. Fibromyalgia syndrome (FMS): a chronic, non-articular rheumatologic disorder that is characterized by systemic, non-inflammatory pain, muscular tender points, and fatigue.

2. Tender point: a localized spot within an area of muscle, ligament, or periosteal tissue that elicits pain in response to sustained, digital pressure (Travel & Simons, 1983).

3. Multidisciplinary treatment approach: the involvement of several professionals from differing disciplines that provide separate and unique treatment according to the needs of the patient (Linder, 1990).

4. Systems view of patient: concerned with the interaction of physical, emotional, and spiritual internal factors of the patient and the interactions of those factors with each other and the environment (Neuman, 1989).
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CHAPTER 1
INTRODUCTION

Background to Problem

Fibromyalgia syndrome is a common, often disabling disorder. Recent epidemiologic studies conducted in the United States have revealed that FMS is the third most commonly diagnosed rheumatologic disorder (Krnsich-Shriwise, 1997). Approximately 15% to 20% of all people seeking rheumatology referrals have FMS (Fan & Blanton, 1992). It has been further estimated that 3 to 6 million Americans (80% to 90% of them women) fulfill the American College of Rheumatology (ACR) criteria for FMS, that is approximately 1 American in 50 is affected (Wolfe et al., 1995). People with FMS usually present with symptoms between the ages of 20 and 50 with 60% of cases being diagnosed between the ages of 30 and 49 (Boissevian & McCain, 1991). Therefore, the majority of patients with FMS are of working age. This fact is reflected in the over 700 million work days lost annually due to pain caused by FMS. Furthermore, $9 billion is spent annually in the United States to diagnose and treat this syndrome (Russell, 1997).

Fibromyalgia Syndrome (FMS) is a chronic, non-articular rheumatologic disorder that is characterized by systemic, non-inflammatory pain, muscular tender points, and fatigue. Symptoms that are often associated with FMS include sleep disturbances, headaches, irritable bowel, paresthesia, and depression. FMS also may occur in the presence of trauma, infection, autoimmune diseases, or hormonal abnormalities (Adams & Sim, 1998). Conditions that are known to aggravate the symptoms of FMS include
poor sleep patterns, anxiety, prolonged inactivity, excess weight, poor posture, repetitive activities, poor nutrition, and weather changes (Krsnich-Shriwise, 1997; Waylonis, Ronan, & Gordon, 1994).

In 1990, specific criteria for the classification of FMS were published by the ACR (Wolfe et al., 1990). These criteria are based on the cardinal signs of FMS that include 1) widespread pain lasting longer than 3 months and 2) the presence of 11 of 18 tender points. The most distinguishing clinical features referred to in the ACR criteria are the tender points. According to Travell and Simons (1983), a tender point is a localized spot within an area of muscle, ligament, tendon, or periosteal tissue that elicits pain in response to sustained, digital pressure. The specific ACR criteria and location of tender points are detailed in table 1.

Individuals with FMS experience pain that is characterized as allodynia and hyperalgesia (Russell, 1998). This means, according to the International Association for the Study of Pain, that patients with FMS experience pain from stimuli that normally would not be expected to cause pain and that these individuals have an increased response to noxious stimuli (Bonica, 1990). Because of these two conditions, many experts believe that patients with FMS have lower than normal nociceptive thresholds (Mountz, Bradley, & Alarcon, 1998; Russell, 1998; Simms, 1998). This would explain the seemingly exaggerated localized tenderness of the muscles and soft tissues.

The pain experienced by patients with FMS is also chronic. This means that the pain lasts longer than three months and is significantly influenced by the interaction of physiologic, psychological, and social processes (Wolfe et al., 1990). Those with FMS often describe their pain as a diffuse or widespread achiness that fluctuates through a
### Table 1
Criteria for classification of FMS (Wolfe et al. 1990)

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<th>Criteria</th>
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| History of widespread pain for at least three months | Pain is considered when all of the following are present:  
- Pain in both sides body.  
- Pain above and below waist.  
- Axial skeleton pain (cervical spine or anterior chest or thoracic spine or low back).  
Shoulder and buttock pain are considered as pain for each involved side. Low back pain is considered lower segment pain. |
| Pain in at least 11 of 18 tender point sites on digital palpation with force of 4 kg/cm^2 | - Occiput: Bilateral, at suboccipital muscle insertions.  
- Lower cervical: Bilateral, at anterior aspects of the intertransverse spaces at C5-C7.  
- Trapezius: Bilateral, at midpoint of upper border.  
- Supraspinatus: Bilateral, at origins above scapular spine near medial border.  
- Second rib: Bilateral, at second costochondral junctions, just lateral to junction on upper surfaces.  
- Lateral epicondyle: Bilateral, 2 cm distal to epicondyles.  
- Gluteal: Bilateral, in upper outer quadrants of buttocks in anterior fold of muscle.  
- Greater trochanter: Bilateral, posterior to trochanteric prominence.  
- Knees: Bilateral, at medial fat pad to joint line. |
wide range of pain sensations, tending to be more proximal than distal. According to researchers, individuals with a chronic pain syndrome such as FMS often present with inconsistent patterns of radiating and referred pain that do not follow a dermatomal pattern and show no abnormal neurologic signs on nerve conduction velocity and electromyographic studies (Roth, Harowitz, & Bachman, 1998). These multifactorial features of FMS can amplify patients' frustrations and anxiety concerning the diagnosis, nature, and prognosis of FMS. Consequently, the chronic pain of FMS may have a disruptive affect on daily function especially when coupled with exogenous factors such as fear of pain and anxiety about potentially pain provoking activities (Schaefer, 1997).

In spite of the apparent impact of FMS on daily life reflected above and the creation of specific classification criteria, the pathoetiology of FMS is unknown. Central and peripheral neurotransmitter deficiencies (Mountz, Bradley, & Alarcon, 1998; Russell, 1998; Sims, 1998), muscle pathology (Olsen & Park, 1998), sleep deprivation (Bennett, 1993; Moldofsky, 1995), and psychological disturbances (Adams & Sim, 1998; Krsnich-Shriwise, 1997) have been identified as possible causes of the syndrome. However, research on these theories is contradictory and the pathophysiologic mechanisms by which these theories operate remain poorly understood.

**Problem Statement**

Because of the complexity and chronicity of the manifestations of FMS and lack of pathoetiologic explanation for the cause of FMS, individuals with FMS often seek treatment beyond conventional medicine. In their 1997 study exploring the frequency with which individuals with FMS seek non-pharmacological interventions, Fitzcharles and Esdaile found that physical therapy was the primary non-pharmacological
intervention in FMS management. Other studies have found that patients with FMS are high consumers of non-pharmacological interventions including symptom control, psychosocial interventions, and physical therapy (Barbour, 2000; Dimmoch, Troughton, and Bird, 1996).

Because patients with FMS frequently seek physical therapeutic intervention, reliable and effective physical therapeutic treatment protocols are needed. However, the establishment of a physical therapeutic management protocol for FMS remains a challenge. This in part may be due to the complex nature of the syndrome, lack of consistent research, and absence of generic treatment guidelines for FMS. For example, patients with chronic pain such as FMS often present with a sense of hopelessness regarding recovery, take analgesic and/or narcotic and/or psychotropic medications, have family problems, are socially isolated, and have failed to respond to “normal” modes of medical treatment in addition to experiencing physical symptoms that are medically perplexing (Sternbach, 1974). Designing a comprehensive physical therapeutic treatment program that effectively assists the patient with FMS in returning to function is further complicated due to an absence of published formal treatment guidelines and limited definitive research on FMS interventions. For example, several researchers (McCain, Bell, Mai, & Halliday, 1988) argue that high intensity (80%-90% of maximum heart rate) aerobic exercise is most beneficial for use in FMS rehabilitation, while others (Lemley & Meyer, 2000; Mannerkorpi, Nyberg, Ahlmen, & Ekudden, 2000; Martin et al., 1996; Ramsay et al., 2000) state that moderate intensity (60%-70% of maximum heart rate) aerobic exercise is most optimal. Furthermore, several different modes of aerobic exercise including aquatic exercise, bicycle ergometer, treadmill walking, and dance have
each been recommended as the ideal mode of aerobic exercise in FMS rehabilitation. Consequently, exercise prescription for patients with FMS is difficult and confounding. Additionally, there is a lack of studies researching the effectiveness of physical interventions in FMS and those that have been shown to work have been only partially successful in controlling symptoms with little encouragement regarding long-term success (Adams & Sim, 1998). This is evident in the fact that although physical therapy is frequently used in the management of FMS, fewer than 50% of patients experience adequate relief of symptoms with physical therapy treatment (Goldenberg, 1989). Moreover, many of the studies conducted on non-pharmacological management of FMS lack reliability. Given this inconsistency for evidence-based treatment of FMS, lack of formal treatment guidelines for FMS, and the multifaceted, complex nature of FMS, better understanding of FMS physical therapeutic management is needed to effectively treat patients with FMS.

**Purpose**

The purpose of this study is to explore some of the concepts under which physical therapists in the Grand Rapids, Michigan area operate when treating patients with FMS. The goal of this research based on the purpose is to provide clearer insight into FMS physical therapeutic management.

**Significance of the Problem**

It is apparent that little consensus exists as to optimal physical therapeutic management of FMS. This is evident in the fact that no formal physical therapeutic treatment guidelines for FMS have been published. With the future advent of direct access in physical therapy, there may be increasing pressure for greater recognition of
non-pharmacological interventions for FMS, especially with regard to compensation. For this reason, physical therapists must develop treatment guidelines for FMS that are consistently effective. Better understanding of FMS physical therapeutic management will assist therapists in facilitating further development of basic theoretical constructs for physical therapeutic approach to FMS management, providing a foundation for the development of formal physical therapeutic FMS guidelines. Additionally, better understanding of FMS management will assist educators in providing a clearer explanation of the challenges to the development of FMS physical therapeutic treatment guidelines to students in allied health programs, possibly inspiring additional research that will aid in the development of formal FMS physical therapeutic treatment guidelines. This study is designed to explore some of the concepts under which physical therapists operate when treating patients with FMS. It is hoped that this study will provide physical therapists with a starting point for better understanding the physical therapeutic management of FMS, thereby facilitating movement toward the development of formal physical therapeutic guidelines for FMS.

**Research Questions**

To achieve the purpose, the following questions were explored in this qualitative study: (a) How do Grand Rapids, Michigan area physical therapists determine FMS interventions in the absence of treatment guidelines?, (b) How do physical therapists in the Grand Rapids, Michigan area judge the effectiveness of their FMS intervention decisions in the absence of FMS treatment guidelines?, and (c) How do physical therapists in the Grand Rapids, Michigan area perceive their personal ability to manage patients with FMS?
CHAPTER 2
LITERATURE REVIEW

The most accepted rehabilitative therapeutic treatments for FMS are aimed at increasing functional activity levels, aerobic conditioning, and education (Adams & Sim, 1998). However, other treatments such as transcutaneous electrical neuro-stimulation, strength training, postural education, massage, aquatic therapy, energy conservation, and biofeedback and relaxation are often being used to treat FMS (Adams & Sim, 1998; Scudds, Charron, Santilli, Li, & Scudds, 1996). Although there is a wide array of rehabilitative interventions in practice as documented above, this review of the literature found evidence only for the use of education, aerobic training, functional training, aquatic therapy, EMG biofeedback, and cognitive-behavioral therapy in FMS treatment.

Aerobic Exercise Research Review

Although the cause remains unknown, FMS has long been considered a muscle disorder (Simms, 1998). Poorly conditioned muscles do not use energy sources efficiently which can lead to fatigue and decreased levels of physical activity, contributing to a deconditioned state. Some researchers believe that the existence of this deconditioned state over time causes morphologic and biochemical abnormalities within the muscle, leading to the pain and stiffness associated with FMS (McCain, 1986; Olsen & Park, 1998; Tammler & Meerschart, 1996). Bennett et al., (1989) found that 80% of patients with FMS were below the average level of aerobic fitness according to the standards of the American Heart Association, supporting the existence of a deconditioned
state in those with FMS. They also found that exercising muscle blood flow was significantly reduced in patients with FMS, suggesting a local detraining effect on muscles in patients with FMS (Bennett et al. 1989). Other research has shown that patients with FMS have significant decreases in muscle strength and endurance when compared with healthy counterparts (Jacobsen & Danneskiold-Samsoe, 1992; Mengshoel, Farre, & Komnaew, 1990; Rantappa-Dahlquist et al. 1992). Further research investigating the relation between muscle abnormalities and FMS has shown that patients with FMS display an inability to relax muscles between contractions, exercise induced myofibrillar necrosis of muscle tissue, and muscular z-band abnormalities with unaccustomed eccentric contractions (Olsen & Park, 1998).

Based on the hypothesis that the pain and stiffness associated with FMS is related to morphologic and biochemical abnormalities within the muscle tissue that are linked to a state of decondition, research on non-pharmocological interventions for FMS has focused primarily on the effects of aerobic exercise on FMS. Several researchers have suggested that aerobic exercise has beneficial effects on FMS (McCain, 1986; Nichols & Glenn, 1994; Lemley & Meyer, 2000; Mannerkorpi, Nyberg, Ahlmen, & Ekdahl, 2000; Martin et al., 1996; Ramsay et al. 2000). These beneficial effects include improvement in physical dysfunction; reduction in the number of tender points and amount of tenderness at tender points; increased feelings of well-being and self-efficacy; and decreased feelings of helplessness, depression, and anxiety (Lemley & Meyer, 2000; McCain, 1986; Nichols & Glenn, 1994). More specifically, researchers hypothesize that aerobic exercise may improve FMS symptomology by increasing muscle resistance to microtrauma,
improving circulation within a muscle, and improving an individual’s sense of being in control of his/her body (Bengtsson & Henriksson, 1989; Bennett, 1989).

High Intensity Aerobic Exercise

The hallmark studies on the role of physical fitness training in FMS were performed in 1986 by McCain and again in 1988 by McCain, Bell, Mai, and Halliday, a group of physicians specializing in rheumatic diseases. In these controlled, double-blinded studies, patients with FMS were assigned randomly into two groups receiving 20 weeks of high-intensity aerobic exercise (80%-90% of age-predicted heart rate for 60 minutes on bicycle ergometer, 3 times a week) or 20 weeks of flexibility training. In both studies, patients assigned to the high-intensity group had significant improvement in cardiovascular fitness, decreased tender point pain, improvement in psychological well-being, and markedly improved patient/physician-rated global assessment scores when compared with those patients assigned to the flexibility training group. McCain concluded that a large number of patients with FMS are capable of sustained, strenuous aerobic fitness training to a degree that enhances cardiovascular fitness. He also concluded that high intensity aerobic exercise training improves objective pain measurements in patients with FMS.

Several limitations exist in the McCain studies that may influence therapists’ abilities to design effective treatment guidelines for patients with FMS. McCain found that during the first 12 weeks of the study many patients in the high intensity aerobic exercise group showed physical deterioration from postexertional pain and stiffness. Consequently, compliance became an issue throughout the study, making it necessary for McCain to obtain several additional trained fitness instructors to supervise patients. The
cost of several trained personnel may limit the application of this program to clinical settings. Another limiting factor on the application of this program to clinical settings is the fact that a bicycle ergometer was used as the mode of exercise. Patients with FMS who have gluteal tender points may find this mode of exercise difficult. Furthermore, the subjects in these studies had difficulty with long-term maintenance of their exercise programs. At a 19-month follow-up, only 6 of 18 participants assigned to the aerobic exercise group were still exercising (McCain et al., 1988). McCain suggested that the intensity of training may have resulted in the lack of long-term compliance. Consequently, although the McCain studies suggested that patients with FMS are capable of sustaining high intensity aerobic exercise to such a degree that a training affect is achieved, the intensity and mode of exercise used in these studies may make it difficult for physical therapists to realistically apply this program in clinics, contributing to the challenge of designing effective formal treatment guidelines for FMS.

Additionally, differences in the subject characteristics in both groups of the McCain studies may have impacted the results of the study. Participants in the high intensity aerobic exercise group were an average of 11 years younger than those in the flexibility training group. Participants in the high intensity aerobic exercise group also had pain scores that were an average of 15.8 mm higher than those in the flexibility training group. Furthermore, there were no men in the flexibility training group. These limitations make it difficult to draw strong conclusions about the outcomes of these studies. Consequently, physical therapists may have some reservations regarding the prescription of high intensity aerobic exercise to patients with FMS.
Moderate Intensity Aerobic Exercise

Several more recent studies from the disciplines of physical therapy, and physical medicine and rehabilitation have been conducted researching the effect of moderate intensity aerobic exercise on patients with FMS (Martin et al., 1996; Buckelew et al., 1998; Gowans, deHuek, Voss, & Richardson, 1999; Lemley & Meyer, 2000; Mannerkorpi, Nyberg, Ahlmen, & Ekdahl, 2000; Ramsay et al. 2000). Researchers conducting these studies have suggested that moderate intensity aerobic exercise may more realistically address the unfit, deconditioned state of patients with FMS. The general conclusions of these studies are that patients with FMS are capable of moderate intensity aerobic exercise from a range of 60% to 80% of their maximum heart rate for 20 minutes 2 to 3 times a week to such an extent that a training effect can be achieved for up to three months. Furthermore, scientists found that those with FMS who participated in these studies showed an overall increase in physical activity and function, and improved well-being as a result of moderate intensity aerobic exercise. Lastly, the results of these studies indicate that subjects with FMS who receive education, relaxation training, and biofeedback training in combination with moderate intensity aerobic exercise training experience more positive outcomes than those who receive moderate intensity aerobic exercise training only.

Nevertheless, the research on the effects of moderate intensity aerobic exercise on FMS has been limited by several factors. First, multiples modes of exercise have been utilized, including treadmill ambulation (Martin et al., 1996), heated pool (Gowans, deHuek, Voss, & Richardson, 1999; Mannerkorpi, Nyberg, Ahlmen, & Ekdahl, 2000), home exercise aerobic training (Buckelew et al., 1998), and circuit aerobic training.
(Ramsay et al. 2000). From these differing modes, it is difficult to clearly ascertain an optimal mode of treatment for FMS. Second, different levels of exercise intensity and inconsistent methods of determining exercise intensity, including age-predicted heart rate (Buckelew et al., 1998; Martin et al., 1995), and rate of perceived exertion (Gowans, deHueck, Voss, & Richardson, 1999; Mannerkorpi, Nyberg, Ahlmen, & Ekdahl, 2000) may have provided confusion as to optimal exercise prescription for FMS. Additionally, other researchers have failed to specify the intensity utilized (Ramsay et al., 2000), contributing to the challenge of physical therapists to definitively identify optimal exercise prescription for patients with FMS. Lastly, there is an absence of longitudinal studies on the effects of moderate aerobic exercise on FMS. From this literature search it is unclear as to the abilities of patients with FMS to sustain a moderate intensity aerobic exercise program beyond 3 months. Because researchers have suggested that there is an exacerbation of symptoms upon initiating an aerobic exercise program that may gradually reverse as aerobic exercise is continued, longitudinal studies in this area are needed (Wigers, Stiles, & Vogel, 1996; Mengshoel, Komnaes, & Forre, 1992). Given these inconsistencies in the research on moderate intensity aerobic exercise on FMS, physical therapeutic exercise prescription for FMS has remained difficult and confounding.

In their 1999 randomized, controlled pilot study, Lemley and Meyer, from the field of human kinetics, attempted to remedy the shortcomings of previous research. They did this by attempting to examine the effects of a 24 week walking program at high intensity (starting at 40% heart rate reserve and reaching a maximum of 85% heart rate reserve at week 10) and low intensity (starting with 25% of heart rate reserve and reaching a maximum of 60% heart rate reserve at week 10) on the physical and
psychological manifestations of FMS. The duration of the exercise in both groups started at 12 minutes, 3 times a week and was gradually increased to 30 minutes, 3 times a week. Lemley and Meyer found that patients with FMS are capable of exercising at levels sufficient to result in an aerobic training effect. However, Lemley and Meyer found that pain ratings showed a trend toward higher scores in the high intensity group at week 24 than in the low intensity group. Additional calculations revealed that exercise intensity approached statistically significant impact on the degree of disability experienced by patients with FMS (high intensity group, Fibromyalgia Impact Questionnaire (FIQ) score $w^2=0.59$ and low intensity group, FIQ score $w^2=0.96$). Furthermore, no improvement was found in the psychological components tested or in pain levels. Based on these results, Lemley and Meyer concluded that high intensity aerobic exercise may increase the impact of FMS and result in greater disability than low intensity aerobic exercise.

Barco and Peters (2001), from the field of physical therapy, also attempted to design a therapeutic intervention program for FMS that is more applicable to the typical out-patient physical therapy clinic setting. Using a single case study, these researchers implemented an eight week protocol that consisted of gentle stretching and strengthening exercises, and education and progressive moderate aerobic exercise (65% of age-predicted maximum heart rate) in the form of treadmill ambulation. The exercise program was administered in two phases. The first phase occurred during the first four weeks and consisted of education, strengthening, and stretching exercises. The second phase, which was implemented during the second four weeks, consisted of a continuation of the exercises in phase one and the addition of the aerobic exercise protocol that began with treadmill ambulation at 65% of age-predicted maximum heart rate for 10 minutes 2 times
a week and gradually increased to 20 minutes 2 times a week by the eighth week. According to Barco and Peters, this form of exercise is cost-effective and easily adaptable to the clinic setting and to the needs of the patient. The results indicated that a decrease occurred in pain along with improvements in function.

Although these studies conducted by Lemley and Meyer (1999) and Barco and Peters (2001) shed some light on the effects of aerobic exercise on FMS, some limitations do exist within these studies that may impact the results. In the Lemley and Meyer study, only 8 of the subjects completed the study. A total of 13 subjects discontinued their participation for various reasons. As a result of the small sample size, no significant differences between the groups were found, rendering Lemley’s and Meyer’s conclusions less convincing as to optimal exercise prescription for patients with FMS. Additionally, Barco and Peters cautioned against generalizing the results of their single case to other patients with FMS, recognizing the need for further research on their particular exercise program using a larger sample. Although the results of both studies are promising, replication of each study with larger samples is needed to clarify the responses of individuals with FMS to these particular aerobic exercise regimens.

**Aerobic Exercise and Pain, Disability, and Psychological Issues**

Other studies have focused on the effects of aerobic exercise on pain, disability, and psychological issues related to FMS. Wigers, Stiles, and Vogel (1996) conducted a randomized controlled study that researched the effects of aerobic exercise and stress management on patients with FMS as compared to control patients with FMS who received “usual treatment”. Wigers et al. found that subjects who received aerobic exercise experienced positive short-term benefit in terms of pain distribution, pain
intensity, energy and work capacity as compared to a group who received stress management training and the control group. As with the other studies mentioned previously, at a four year follow-up Wigers et al. found no apparent differences between the treatment groups and the controls in severity of symptoms due to a lack of compliance among participants.

In spite of the positive results of the study conducted above, the majority of the research reviewed that has been conducted on the effects of aerobic exercise on pain, disability, and psychological measures has been less certain. The results of other studies in this area either indicate conflicting results on pain, disability, and psychological measures (Ramsay et al., 2000), or they indicate that patients with FMS experience no significant improvement in pain and psychological measures as a result of aerobic exercise (Mengshoel & Forre, 1993; Nichols & Glenn, 1994). Additionally, the studies reviewed used various modes of aerobic exercise including ambulation (Nichols & Glenn, 1994), aerobic dance (Mengshoel & Forre, 1993), and aerobic fitness classes (Ramsay et al., 2000), providing further confusion as to the optimal aerobic exercise intervention for FMS.

From this literature review of the effects of aerobic exercise on FMS, it seems that the lack of definitive information on the effects of aerobic exercise on pain, disability, and psychological factors and the lack of clearly defined specific parameters of aerobic exercise regimens have created uncertainty as to optimal physical therapeutic FMS management. Nevertheless, because of new research involving single photon emission computed tomography (SPECT) technology (Mountz, Bradley, & Alarcon, 1998; Russell, 1998), magnetic resonance spectroscopy (MRS) technology (Simms, 1998; Russell,
and more sensitive measuring of cerebral spinal fluid (Mountz, Bradley, & Alarcon, 1998; Russell, 1998), focus is shifting away from morphologic and biochemical muscle abnormalities as the primary theoretical pathoetiology of FMS. Over the last few years scientists have found evidence contradicting the previously accepted pathoetiology of muscle abnormalities. For instance, using more sensitive equipment and better controlled methods, scientists have shown that the morphology of muscles belonging to patients with FMS are normal or are nonspecific to FMS (Simms, 1998). Furthermore, the use of new technology has assisted scientists in providing evidence that the biochemical processes of muscles at the tender points of patients with FMS are not different than those in sedentary controls (Simms, 1998). Given this new evidence, scientists are now focusing their efforts on the study of afferent nocioception and adaptive functions of the central nervous system. For instance, researchers have found evidence of low serotonin and elevated substance P (substances consistently linked to pain amplification syndromes) in patients with FMS (Mountz, Bradley, Alarcon, 1998; Russell, 1998). Because patients with FMS experience various multifaceted symptoms, it is logical to consider the complex interactions of the peripheral and central nervous systems with patients’ genetic factors, psychosocial conditions, and emotional well-being as possible pathoetioligic contributors. Therefore, multidisciplinary approaches to the treatment of FMS are being researched, which may provide a more thorough foundation for the development of formal physical therapeutic treatment guidelines for FMS.

Multidisciplinary Intervention Research Review

According to Linder (1990), a multidisciplinary approach is characterized by the involvement of several professionals from differing disciplines that provide separate and
unique treatment according to the needs of the patient. A systems approach is concerned with the interaction of physical, emotional, and spiritual internal factors of the patient and the interactions of those factors with each other and the environment, society, and world at large (Neuman, 1989).

Researchers have postulated that the abnormalities manifested in FMS are influenced by both external and internal factors such as stress, trauma, genetic predisposition, infection, physical conditioning, and mental and social health (Adams & Sim, 1998; Yunus, 1992; Zimmerman, 1991). When asked about the importance of using a systems approach with a variety of treatment in chronic pain management, more than 50% of experienced physical therapists agreed that a systems approach was highly effective, allowing flexibility and creativity in patient treatment (Askew et al., 1998). To understand this concept, Yunus (1992) developed a comprehensive systems model that explains the theory of complex interactions involved in FMS. This model is displayed in diagram 1.

Studies within the discipline of behavioral medicine using multimodal forms of treatment with a systems approach to management have seen positive results in both FMS pain and function. Nielsen, Walker, and McCain (1992) studied the effects of a multimodal program that included cognitive-behavioral techniques, physical therapy, and pain medication reduction on patients with FMS. The results showed significant improvement on a number of pain scales. After evaluating patients with FMS that had undergone a multidisciplinary treatment program, Bennett (1993) found a 60% improvement in the total myalgic score and a 50% improvement in the amount of pain at tender points and number of tender points.
Figure 1. Comprehensive systems model of FMS interactions. (Yunus et al. Diagram 1994).
Mason, Goolkasian, and McCain (1998) measured both objective and subjective pain reactions in patients with FMS undergoing multidisciplinary treatment in their quasi-experimental study evaluating a multimodal treatment program for patients with FMS. Patients with FMS participated 6 days a week for 1 month in a treatment program that included physical therapy and exercise, daily monitoring of medication, and patient education in cognitive-behavioral techniques. Mason et al. revealed that when compared with control subjects who did not receive treatment, patients undergoing the intervention experienced a 54% improvement on psychological measures. Additionally, self-report pain measures were significantly reduced with a 100% improvement in patients' sense of control over their pain. Nevertheless, Mason et al. did not find an improvement on objective, laboratory pain measures of patients participating in this program. Because of these results, Mason et al. suggested that improvement in FMS may depend more on factors such as increased endurance and more effective coping skills rather than upon changes in tender points and generalized pain sensitivity.

In contrast to the Nielson and Bennett studies, Mason et al. did not find an improvement in objective pain measures accompanying the improvements they found in the subjective measurements. This may be because of methodological differences in the studies. The researchers in the Nielson and Bennett studies used palpation with a 3-point rating scale to objectively measure pain in their studies, emphasizing subjects’ tolerance to pressure pain. Mason et al. on the other hand, measured subjects’ ability to endure cold induced pain. Consequently, the scientists were measuring differing types of pain, which may account for the contradictory results. This then raises the question of how physical therapists judge the effectiveness of their interventions. In order to develop formal
treatment guidelines for the physical therapeutic treatment of FMS, physical therapists must not only establish prescriptions for treatment interventions that are consistent, their treatment interventions must also be effective. However, to date no objective test exists that reliably measures tender points, contributing to the already uncertain environment surrounding FMS physical therapeutic treatment in which physical therapists must make decisions.

Impact of Physical Therapist in Multidisciplinary Treatment of FMS

If this multidisciplinary, systems approach to FMS management is applied, a critical area in the treatment of FMS that must be considered is the impact of the physical therapist. In a recent study exploring orthopaedic physical therapists’ knowledge and attitudes toward patients with benign chronic pain, Wolff, Michel, Krebs, and Watts (1991) found that 72% of physical therapists believed that their formal education in pain management and theory was inadequate to deal with an orthopaedic patient population with chronic pain. Additionally all therapists scored low on pain knowledge questions and questions about attitudes towards patients with benign chronic pain. Wolff et al. found overall that the therapists in this study showed an overwhelming preference for treating patients with acute conditions over those with chronic pain. The researchers suggested that the apparent deficiencies in knowledge and negative attitudes towards patients with chronic pain could have a direct effect on patient-therapist relationships, the treatment patients with chronic pain such as FMS receive, and the outcomes of those treatments.

Several studies in the nursing field have indicated that clinician knowledge and field experience (Jennings & Muhlenkamp, 1981), diagnosis (Hardin & Hailey, 1993),
attitudes (Hauk, 1986), and socio-economic status and culture (Mozhan & Northcott, 1989) are related to healthcare professionals’ behavior and beliefs about chronic pain management. However, only one study to date has researched physical therapists’ perceptions of chronic pain and its effect on patient treatment (Askew et al., 1998). 

Askew et al. interviewed 46 physical therapists with at least two years experience practicing in pain management clinics, outpatient clinics, or sports medicine clinics. Askew et al. found that one of the most important factors that affected physical therapists’ perceptions of patients with chronic pain was therapists’ personal and professional experience with chronic pain. The amount of experience therapists had was directly related to their ability to effectively evaluate and treat patients with chronic pain. Additionally, Askew et al. found that therapists who were practicing in pain clinics approached patients with chronic pain with a more holistic and multidisciplinary model and were more likely to explore the psychosocial aspects of the patients than therapists practicing in outpatient or sports medicine clinics. Conversely, physical therapists practicing in these latter clinics were more likely to treat patients’ physical symptoms only and demonstrated a greater degree of frustration when positive outcomes were not achieved.

Summary and Implications for the Study

Overall, the information provided in the studies discussed in this literature review present a confounding picture. Although it seems that patients with FMS are capable of sustaining aerobic exercise to the extent that a training effect occurs, a large amount of uncertainty as to optimal mode and intensity exists. Furthermore, lack of compliance seems to be a significant issue in the FMS population. It seems that although patients
with FMS are able to undergo aerobic exercise, question remains as to their ability to sustain aerobic exercise for longer than 3 months. Some researchers have suggested that this lack of long-term compliance may be due to the intensity of the exercise (McCain et al., 1988). Others have suggested that the psychosocial factors of FMS may negatively influence the ability of patients’ with FMS to participate in a long term, traditional aerobic exercise program (Lemley & Meyer, 1999). Barco and Peters (2001) further postulate that exercise mode, intensity, and duration should vary on a daily basis in order to remain interesting and motivating to the patient with FMS. Still others (Mason, Goolkasian, & McCain, 1998) have postulated that those with FMS would benefit most by participating in group aerobic exercise. Several researchers (Nielson, Walker, & McCain, 1992; Bennett, 1993) have found that when patients with FMS participated in group behavioral therapy, increased feelings of well-being and greater self-confidence was reported. However, it is not known the extent to which these factors influence a patients’ ability to sustain aerobic exercise for longer than three months. Additionally, it seems according to this literature review, that researchers have produced variable results as to the effects of aerobic exercise on pain and tender points experienced by patients with FMS. Furthermore, there is little clear evidence as to the extent that aerobic exercise influences function, disability, and psychosocial factors in the FMS population.

From this literature review, the most positive results seem to have been produced from studies in which a multi-disciplinary approach using physical therapy combined with cognitive-behavioral training, medication control, education, and coping-skills training was applied. The researchers that used multi-disciplinary approaches produced favorable results with regard to function, disability, and psychosocial aspects of patients
with FMS. However, the studies conducted using this multi-disciplinary approach are few in number and contain methodological flaws. Consequently, strong conclusions about these results cannot be made.

It is obvious, based upon the results of this literature review that much uncertainty exists with regard to FMS management. This uncertainty can complicate therapists’ abilities to design effective comprehensive physical therapeutic treatment interventions that are needed in order to develop formal physical therapeutic treatment guidelines for FMS. This study seeks to provide physical therapists with clearer insight into FMS physical therapeutic management, thereby facilitating movement toward the development of formal physical therapeutic guidelines for FMS. This goal will be met by exploring some of the concepts under which physical therapists operate when treating patients with FMS. This study will further add to the existing body of knowledge concerning FMS physical therapeutic management by providing information regarding physical therapists’ perceptions about the effectiveness of their intervention decisions and physical therapists’ personal abilities to manage patients with FMS from the qualitative perspective.
CHAPTER 3
METHODOLOGY

Study Design

Qualitative Paradigm

In order to fulfill the purpose, this study was designed using qualitative methods. According to Denzin and Lincoln (1994), qualitative research is characterized by the study of “…things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (p.2). Qualitative methods involve the collection of experiential and observed information to describe routine and problematic moments and meanings in individuals’ lives (Denzin & Lincoln, 1994).

Researchers in this field submit to specific assumptions about the world. One such assumption is that a reality, which can be studied, captured, and understood, exists. Another assumption is the belief that research findings are embedded within the social constructs of the world and as such, rich descriptions of social interactions obtained through detailed interviewing and observation are necessary for understanding complex human interactions. Lastly, those prescribing to the qualitative paradigm assume that the researcher is a part of the study and an intimate relationship exists between the researcher and the subject/s being studied. Because of this belief, researcher bias and subjectivity are seen as an integral part of qualitative research.

Although patients with FMS meet the ACR criteria for classification of FMS, they are not a homogenous group. Patients with FMS have differing functional abilities, and a variety of psychosocial and behavioral characteristics. Additionally, physical therapists
treating patients with FMS may have a wide degree of personal and professional experience managing those with FMS. I believe that a reality exists in which there is uncertainty regarding FMS physical therapeutic intervention. Consequently, I believe that physical therapists draw upon a unique collection of experiential events formed from the complex interactions that take place between patients with FMS and physical therapists in order to construct a framework for management of FMS. Therefore, a qualitative paradigm that used interviews to explore how Grand Rapids, Michigan area physical therapists make decisions in FMS management and their perceptions of the effectiveness of those decisions was used in this study.

Lastly, conforming with the qualitative paradigm, this study contained a bias in which the subjective views of the researcher were included. Given the fact that the symptoms of FMS often persist long after receiving treatment, I believe that physical therapeutic interventions aimed at symptom relief, pain management, and physical conditioning are not adequate to provide successful recovery in the patient with FMS. I believe that FMS lends itself well to a multidisciplinary, systems approach because of its chronicity, degree of pain, and complexity of the physical and psychosocial aspects. I further believe, based upon the results of the literature review and personal experience, that physical therapy combined with cognitive-behavioral treatment, education, and coping skills, with considerable patient involvement, helps patients with FMS gain control over pain contingency behavior, manage stress, decrease depression and anxiety, decrease disability, and return to physical, occupational, and social functioning. Moreover, based on information found in the literature (Askew et al., 1998; Wolff et al.,
I believe that the practice setting in which FMS may be most successfully managed with a multidisciplinary, systems approach is within pain clinics.

Because the goal of this study was to provide clearer insight into how decisions are made with regard to FMS treatment, a multidisciplinary, systems approach bias was contained within this study to ensure that an exploration of comprehensive intervention took place. However, the existence of other approaches that participants believed to be successful in the management of FMS were not disregarded. Rather, the bias contained within this study was used as a starting point for understanding and interpreting the data.

Qualitative Method

In addition to adhering to the assumptions of the qualitative paradigm, the specific qualitative methodology used in this study was constructed from a combination of grounded theory (Denzin & Lincoln, 1994; Feldman, 1995) and the collective case study (Denzin & Lincoln, 1994). According to Denzin and Lincoln (1994), grounded theory uses the technique of comparison to generate conceptual theories from data that already exists and/or is newly collected. Researchers who apply this theory attempt to discover patterns of action or interaction between and among the data (Feldman, 1995). From these interactions, a systematic statement or theory may be generated about plausible relationships. Therefore, inductive theory building that is “grounded” within the data takes place (Denzin & Lincoln, 1994). In this study, interviews were used to provide data that contained vivid descriptions of FMS interventions, and physical therapists’ perceptions and justifications of efficacy with regard to FMS interventions. Relationships and patterns within the data were then analyzed in order to determine a general
conceptual basis or theory under which physical therapists operate when treating patients with FMS.

The specific qualitative method used in this study was also constructed from the collective case study. In qualitative case studies strong naturalistic, holistic, cultural, and phenomenological interests dominate. According to Denzin and Lincoln (1994, p.236), case studies “...draw attention to the question of what specifically can be learned”, from the case. In the collective case study researchers inquire into the phenomenon, population, or general condition of several cases with an expectation that better understanding or better theorizing will result. Denzin and Lincoln further believe that the inclusion of cases within a qualitative study can add a dimension of uniqueness and diversity to the study, providing opportunities for richer interpretation of data. In this qualitative study, interviews were also used to explore physical therapists' individual experiences with specific patients with FMS. These personal experiences were analyzed and isolated into themes, issues, and recurring motifs from which a better understanding of FMS management was constructed.

Study Site and Subjects

The sample used in this study consisted of four physical therapists who were employed at Grand Rapids, Michigan area pain clinics. Following a review of the literature (Askew et al., 1998; Wolff et al., 1991), pain clinics were determined to be sites best suited to the multidisciplinary nature of the study. As such, a key informant who was experienced in multidisciplinary, systems practice and had knowledge of the nature of the inclusion criteria for this study was used to identify potential sample sites. In addition, other potential sample sites were chosen from a local telephone directory. The subjects
had at least three years' professional experience in the field and two years' professional experience working in area pain clinics. Additional criteria for inclusion in the study were 1) experience treating at least 25 or more patients a year with at least a secondary diagnosis of FMS (for the purposes of this study, a secondary diagnosis of FMS is defined as the presence of medically diagnosed FMS in conjunction with another impairment for which a patient is receiving treatment, 2) self-identified use of a multidisciplinary approach (as defined in chapter 2) in the management of FMS, and 3) a self-identified systems view (as defined in chapter 2) of patient interaction in FMS management. The physical therapists were selected from area pain clinics (N=4) using either a key informant or a Grand Rapids, Michigan telephone directory. The sample included 2 women and 2 men (see Table 2). The subjects' ages ranged from 29 to 48 years. Years of practice in the field of physical therapy ranged from 4 to 25 years. The number of years the subjects worked within a Grand Rapids, Michigan area pain clinic ranged from 2 to 15 years. Three of the subjects had bachelors' degrees in physical therapy and one had a masters' degree in physical therapy. All of the subjects had previous experience working in the area of in-patient rehabilitation, and half of the subjects had previous experience working at long-term care facilities. Other areas of physical therapy practice in which subjects had previous professional experience include out-patient orthopedic clinics, pediatric care within educational systems, and occupational rehabilitation. The interviews took place at a time and location according to subject preference. Three of the interviews took place at the facilities in which the subjects were employed. One interview was conducted in the private residence of the subject.
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<td>In-patient acute rehab, long term rehab, occupational care</td>
<td>Pediatric rehab, long term rehab, long term paediatric rehab, in-patient care</td>
<td>In-patient acute rehab, long term rehab, occupational care</td>
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To ensure that the study was safe and ethical, the proposed research was reviewed and approved by the Grand Valley State University Human Subjects Review Committee. All facilities from which the sample was obtained were not identified in the study to protect the confidentiality of the facilities. To further ensure the protection of confidentiality, subjects names and personal identifying characteristics were not used during the interview. Additionally, each participant signed a Human Subjects Consent Form (Appendix A) in which a detailed explanation of the study and confidentiality was fully disclosed.

Instrumentation

A semi-structured interview consisting of 7 open-ended questions was used to explore therapists’ treatment intervention decisions, and perceptions and judgments of the effectiveness of those intervention decisions with regard to FMS (Appendix B). Research committee members knowledgeable in the use of qualitative methods reviewed the research questions and the interview questions for content and clarity to ensure that the questions addressed the purpose of the study.

Because a semi-structured interview was used, subjects’ responses guided the direction of the interview. This means that semi-structured questions were used only as a framework for the interview with a variety of prompts to explore ideas presented by the subjects. The subjects were also encouraged to share particular experiences with patients with FMS. Additional semi-structured questions were added to the interviews following interview one in order to more fully develop concepts expressed by the therapists (Appendix B). Each interview was audiotaped and conducted by one individual.
researcher to ensure consistent question sequencing, tone, and non-verbal cueing in order to enhance consistency of the interview questions and process.

**Trustworthiness**

In qualitative research the traditional ideas of internal and external validity are replaced by the term trustworthiness (Denzin & Lincoln, 1994). Trustworthiness in qualitative study is represented by a set of criteria that reflects the general assumptions made of the field. The first criterion is that trustworthiness involves the “credibility of portrayals of constructed realities” (Denzin & Lincoln, 1994, p. 151). This means that the relationships described in the data are accurate. In this study, the process by which relationships in the data were formed was reviewed by research committee members to ensure that accuracy occurred across the data.

The second criterion for trustworthiness according to Denzin and Lincoln (1994) is anticipatory accommodation. This means that researchers in qualitative studies strive to obtain a greater understanding of the world and how it is shaped according to a specific group of individuals by collecting data from a variety of comparable contexts, events, and experiences within a specific group. Physical therapists in this study worked in similar facilities and used a multi-disciplinary approach to FMS management. Additionally, each therapist had varying degrees of experience and differing backgrounds that influenced FMS management. As such, the participants' unique perceptions and beliefs about how they determined interventions and judged the effectiveness of their decisions in FMS management were compared to fully explore FMS management within this particular group of physical therapists. Thick descriptions of these therapists' perceptions and
beliefs were used in reporting the results in order to provide a deeper understanding of FMS management for similar populations of physical therapists.

The third criterion, truth, involves meaning given to the relationships from the data (Denzin & Lincoln, 1994). In this study, corresponding interpretations of data were reviewed by research committee members experienced in qualitative data analysis to ensure that correct distinguishing representations were made according to their meaning.

Additionally, the three criterion for trustworthiness, accuracy, anticipatory accommodation, and truth, were further augmented by the maintenance of an audit trail throughout the data collection and analysis (Appendix D). An audit trail is a record displaying the process used for data analysis. This record allows other researchers and committee members to review the data analysis process for accuracy, anticipatory accommodation, and truth. Furthermore, an audit trail enhances trustworthiness by providing the process through which the raw data is linked to the research questions.

Procedure

Initial sites were chosen using referrals from a key informant who was experienced in multidisciplinary, systems practice and had knowledge of the nature of the inclusion criteria for this study. In addition, other potential sample sites were chosen from a local telephone directory. Initial contact was made via telephone with facility supervisors. The purpose of the research project and the fact that no identifying references would be made to the facility during the research was explained to each facility supervisor. After this explanation of facility confidentiality was given, permission from each facility supervisor to speak with possible participants was obtained via telephone. After receiving verbal permission from each facility supervisor, possible
participants were contacted directly via telephone at which time the purpose and goals of the study were explained. The inclusion criteria were also discussed. Definitions of the inclusion criteria including multidisciplinary treatment, systems view of patient interaction, and diagnosis of secondary FMS were verbally explained so that possible participants clearly understood the inclusion criteria. Upon participants' verbal recognition that they met the inclusion criteria, participation within the study was discussed and the procedure of the study explained. After this portion of the telephone recruitment was completed, permission to interview those therapists that met the criteria for inclusion in the study was obtained verbally from each therapist via telephone. After receiving verbal permission from participants via telephone, interviews were scheduled according to the convenience of the participant.

Immediately prior to the start of the interview, each participant was asked to sign a Human Subjects Consent Form in which the purpose and goals of the study were clearly delineated and an explanation of subject confidentiality provided (Appendix A). At the start of each interview, the participants' age, credentials, number of years of professional experience in the field, and number of years of professional experience in the pain clinics were obtained for the purpose of describing the sample on a written demographics sheet (Appendix C).

Semi-structured interviews lasting approximately 1 hour in length and at a time and place convenient for each subject, were then conducted by the researcher. Each interview was audiotaped. Audiotapes of each interview were then transcribed for analysis. Results of a within-interview comparison of data were then used to form additional questions that were included in the structured framework of proceeding
interviews in order to more fully explore and compare concepts revealed within the data (Appendix B).

Confidentiality

To maintain confidentiality, individual identities of subjects were not revealed on any written documents. Furthermore, in order to protect the information given by subjects contained on audiotapes and within transcriptions, at no time were personal identifying characteristics used during the interview. Additionally, the individual facilities at which subjects are employed were not identified in the study. Although subjects were asked to provide narrative experiences with regard to FMS management, identifying references to the facility were not made during the interviews. The principal researcher and three research committee members were the only people allowed access to the data collected in this study. Audiotapes and transcriptions of data were stored in a secure location and kept for the duration of the study, and then destroyed upon completion of the study to protect confidentiality. Lastly, participants were informed that although quotes from the interviews may be used in the final research report, personal identities would not be disclosed in any publications resulting from this research project.
CHAPTER 4
RESULTS/DATA ANALYSIS

Techniques of data analysis

This qualitative data analysis was designed to determine a general conceptual basis or theory under which Grand Rapids, Michigan physical therapists operate when treating patients with FMS. The data analysis enabled the researcher to construct a framework of physical therapists’ beliefs and perceptions regarding decision-making in FMS management. Through analysis of participants’ narrative experiences, a better understanding of physical therapists’ perceptions about how they judge the effectiveness of their FMS intervention decisions, and how they perceive their ability to manage FMS was obtained.

An on-going thematic analysis with attention to metaphorical language, conceptual information, narrative experiences, and therapists’ perceptions was conducted throughout the data collection of this study. The processes used for data analysis in this study were based upon Feldman’s (1995) suggestions for fieldwork clustering. A total of four semi-structured interviews were conducted in order to gather data for this study. A within-interview analysis using a computer was performed on the data collected for each interview in order to form additional questions included in the structured framework of each subsequent interview. Following each interview, a computer was used to sort material within the transcriptions into color coded groups that contained similar concepts (See Appendix D for complete audit trail of data). These groups were then analyzed for interpretive meaning. This process, according to Feldman, serves to help link pieces of
data into a pattern that increases the significance of the data. Once the patterns of these color coded groups of similar concepts were established, they were placed into categories and labeled according to their overall theme. For example, data related to sleep deprivation as a possible pathoetiology for FMS was placed into a concept group and color coded red. Other data related to differing theories of pathoetiology were put into groups and also color coded red. All groups color coded red were then reviewed in order to examine the various relationships within the data of the groups, establishing patterns. All groups color coded red and having similar relationships were placed into the category of “pathoetiology”. Those groups that had opposing relationships were placed into a different category entitled “opposing beliefs on pathoetiology”. After the data were placed into categories according to emerging patterns, the data were reviewed again and questions related to emergent patterns were formed and included in subsequent interviews (see Appendix B).

Additionally, a cross-interview analysis using techniques performed in the within-interview analysis was conducted throughout the data collection process. This allowed the research to compare information given in different interviews and compile a richer field of data. Cross-interview analyses using a computer to sort, color code, and label data were conducted following (a) the second interview that analyzed data collected from interviews one and two; (b) the third interview that analyzed data collected from interviews one, two, and three; and (c) the fourth interview that analyzed the data collected from interviews one, two, three, and four. Concepts that appeared across the transcripts of differing interviews were sorted according to similar concept groups and color coded. The resultant groups were then analyzed for interpretive meaning and
emergent patterns across the interviews identified. After the patterns were linked, similar concept groups were placed into an already existing category or a new category with a new color. Following the completion of all the interviews, relationships between the data appearing across all of the categories of all the transcribed interviews were explored and constructed. Finally, the constructed relationships were summarized resulting in the combining of several categories of data. These summarized groups were then linked to the research question and placed into final categories directly related to each research question. For example, the categories “pathoetiology,” “opposing beliefs of pathoetiology,” and “differences between patients with chronic pain and FMS” were combined to form the summarized group of “physical therapists’ beliefs of FMS.” This summarized group was then placed along with four other summarized groups into the final category of “factors affecting decision-making” which related directly to the first research question of the study. Each step of both the within-interview data analysis and the cross-interview data analysis was reviewed by committee member experienced in qualitative data collection to enhance trustworthiness.

Justification of Data Analysis Methods

The within-interview and the cross-interview analyses were chosen as data analysis methods in this study for several reasons. A within-interview analysis allowed the researcher and committee members to explore concepts expressed by each therapist within the interview. These concepts were then given meaning that formed a preliminary framework on which a theory under which physical therapists operate when treating patients with FMS was formed. The cross interview analyses allowed emergent patterns within the data to be compared throughout the interview process. This comparison of
emergent patterns is important because it allowed the researcher and committee members to explore patterns as they evolved throughout data collection. From this comparison, the existing theoretical framework was refined. The comparison also allowed new concepts that may have influenced the theoretical framework being formed to be investigated from one interview to the next. Lastly, conducting both within-interview and cross-interview analyses ensured that concepts expressed by the subjects interviewed were fully explored, adding to the richness and depth of the qualitative data.

Results

The data collected were separated into seven categories relating to the three research questions in this study which are: (a) How do Grand Rapids, Michigan area physical therapists determine FMS interventions in the absence of treatment guidelines?, (b) How do physical therapists in the Grand Rapids, Michigan area judge the effectiveness of their FMS intervention decisions in the absence of FMS treatment guidelines?, and (c) How do physical therapists in the Grand Rapids, Michigan area perceive their personal ability to manage patients with FMS? The results from each category are summarized and presented as quotations from interviews. Direct quotations are considered low-inference data according to Goetz and LeCompte (1984). Low-inference data is information that respondents actually state as opposed to what the researcher might infer was meant from the interview. Low-inference data supports the credibility of the categories established when conducting a qualitative study. The seven categories of data are broken into sections that are associated with each research question.
Determination of FMS Interventions

Factors Affecting FMS Decision-Making

Several factors were found to affect the FMS intervention decisions made by physical therapists in the Grand Rapids, Michigan area, including physical therapists’ beliefs about FMS, physical therapists’ FMS treatment principles, personally identified influencers of their decision-making processes, and physical therapists’ process of decision-making in FMS intervention.

Physical therapists’ beliefs concerning FMS were widely divergent. The data collected revealed that while the physical therapists interviewed supported sleep deprivation, stress, muscle pathology, genetic factors, and negative/stressful life events as having possible links to FMS, little consensus existed as to the nature of these links. For example, physical therapists disagreed as to whether those with FMS contain a genetic factor related to their personality type that predisposes them to FMS.

I believe that certain people may be predisposed to fibromyalgia and that maybe it may have a genetic factor involved as well, because everyone that I have seen has that same Type A personality where they feel they must be in control of every aspect of their lives, most of them do not display typical pain behaviors, and most are the directors of their families or in their work situations. So I think there is a predisposition there that may be linked to some kind of possible genetic factor along with the sleep and depression factors.

I don’t know so much that their personality is the direct cause of fibromyalgia, like I don’t think that these people are a ticking time bomb waiting for a personal tragedy that will trigger this disease.

Many of the therapists interviewed expressed a lack of belief in the deconditioned state theory as a possible pathoetiology for FMS.

Well there are some who believe that fibro is purely a condition of being out of shape so to speak. The theory as I understand it is that a sedentary person may do something they normally do not do like working in the garden for 6 hours or walking all day at the fair or something and then
they get really sore afterward and so they don’t move because it hurts and then the pain gets worse because they are not moving and so they cut down their activities even more to where they eventually are on the couch all day long. Anyway, I don’t really put much stock in this theory, because if this were true then just getting these people back into shape would cure their pain and with fibromyalgia this does not happen.

However, two of these same therapists that expressed disbelief in the deconditioned state theory gave descriptions a FMS disease process that are similar to that described in the deconditioned state theory.

These people can’t cope with their lives. They all have work problems, family problems, emotional problems, and so on. So the least little thing causes them stress. And how do they deal with it? They tighten up. This makes your muscles sore because they are constantly contracting. So you hurt and you are in pain. Then you quit doing things because you’re in pain all the time and you don’t sleep well because you’re in pain. So, because you aren’t moving and aren’t sleeping, circulation decreases and you don’t get any oxygen to the muscle and the by-products of metabolism build up and cause tender point.

Physical therapists also disagreed about the relationship of stress to FMS pathoetiology. One physical therapist believed that stress was related to the sleep deprivation experienced by patients with FMS while other physical therapists believed that stress was related to muscle pathology.

One of the [patients] I saw that had been diagnosed with fibromyalgia was actually raised in a home with a fairly abusive father. More mental abusive then physical abusive, to the point at the age of 8 [the patient] remembers going for a sleep study because literally if [the patient] didn’t fall asleep before he came home form work, he worked second shift, [the patient] would be awake all night. [The patient] had quite severe myofascial irritation and stress [his/her] whole life, hence the sleep deprivation.

So, I guess what I’m really trying to say is that something happens to these patients to make them stressed out. And they end up in the long run not being able to cope with anything. So, their stress ends up with somatic presentations like really tight muscles.
In addition to holding differing beliefs about the pathoetiology of FMS, the physical therapists in this study had specific perceptions of the personality characteristics of patients with FMS. All physical therapists interviewed believed that patients with FMS have a certain personality type that is universally displayed in FMS and is different from patients who have other types of chronic pain.

They are definitely type A personality. They are control freaks and worry worts and they definitely don’t know how to let others help them do tasks. I think that’s why they always are trying to do everything themselves. I think it may stem form their emotional and psychological issues. And I also think these people look at it like if they control their lives and the things in their lives then they can control their stress. Obviously this isn’t true or I wouldn’t be seeing them.

Patients with other types of chronic pain are more helpless and they tend to not to fight it as much. You know they’re not in denial. Patients with fibromyalgia think if they just try harder they will be cured. They are constantly looking for cures. Other patients with chronic pain accept their pain much more easily.

Another belief that physical therapists had with regard to FMS involved the diagnosis of FMS. All physical therapists perceived the diagnosis of FMS as including a broad category of patients with symptoms of vague chronic pain, referring to the use of the FMS diagnosis as a ‘garbage pail diagnosis’.

So, I see a lot of patients that have chronic pain that is vague and undefinable being diagnosed with fibromyalgia. I think the diagnosis is used a lot as a garbage can diagnosis.

Physical Therapists’ FMS Treatment Principles

The second factor that affected physical therapists’ FMS intervention decisions was physical therapists’ FMS treatment principles. In this area, two key principles emerged in which all physical therapists seemed to believe: a multidisciplinary approach and education.
I think the best way to manage fibromyalgia is with a multidisciplinary, behavioral approach. There’s so much more involved with patients with fibromyalgia than just the physical. It’s important that they see a dietician to help them develop healthy eating habits and to clean their system of toxic chemicals. They need to see a psychologist to learn healthy ways to cope with the issues in their lives. They need to have their medications monitored and in most cases I believe the amount and types of medications they are on need to be decreased. They need to see an O.T. so that they can learn how to do specific tasks correctly, and they need to see a P.T. so that they can physically become stronger.

Education and being treated by all of these people on the team including myself really makes sure that patients are given the best and most tools possible to cope with fibromyalgia.

I focus a lot on education so that patients understand where I am coming from and why I do the things I do.

Other treatment principles reported by the physical therapists in this study were contradictory in nature. These treatment principles included the physical therapists’ approaches to FMS treatment, responsibility for patient outcomes, and the goals of physical therapy in FMS management. Most therapists interviewed believed in a functional approach to patient treatment. The data on this area seems to indicate that these therapists believe that a treatment program that is based on improving physical function without increasing pain will improve both the physical and psychological wellness of patients with FMS. Another therapist interviewed believed that patients with FMS do not need functional training, believing that the deficits presented in FMS are a result of pain. Consequently, a program of symptom management is warranted. Still, other therapists interviewed in this study believed that a program that focuses on giving the patient tools that will allow patients to actively treat themselves is the most optimal approach.

I also believe in emphasizing function. It’s been my experience that the programs out there that just try to decrease their pain and focus on reducing painful symptoms are by and large unsuccessful at improving fibromyalgia. So, I focus on improving the patient’s function.
After a while I found that most patients really didn’t need the endurance and strength training. The ability to function was there. It was just inhibited by pain from a tight fascial system.

And of course, the patient is the pinnacle of the rehab process. They must be an active part of their rehab. They must commit to helping themselves get better.

Physical therapists interviewed in this study also reported differing opinions on the principle of the responsibility for patient outcomes. Most of the therapists believed the patient is responsible for the outcome of therapy, while one therapist held the view that the responsibility for the outcome of therapy in FMS management is that of the multidisciplinary team.

Plus, when you make the patient responsible for their own health and their own recovery, you disavow responsibility for their outcome. It ultimately comes down to how much the patient is willing to commit and your willingness as a therapist to help them.

The other thing is that when you are a part of a team not all of the burden of the success of the patient falls on your shoulders. Everyone becomes responsible for the welfare of the patient. It’s nice that way because you share the burden and if the outcome is not exactly what you hoped for then the whole team analyzes the situation for what could be done better next time.

The data collected regarding physical therapists’ treatment principles revealed differences in the goals of therapy for patients with FMS. Half of the therapists interviewed reported the main goal of a physical therapeutic program for patients with FMS should be return to function and independence in a home exercise program. On the other hand, half of the therapists interviewed believed that the goal of therapy with regard to FMS should be obtaining the equilibrium of the body systems.

My goal is to get my patients with fibromyalgia independent with a home exercise program and independent with an aquatic program at a site closer to home.
And so our goal is to improve their function. And generally when fibro patients conclude our program they feel their function has improved.

I think as a team we try to help patients with fibromyalgia realize that their emotional and psychological state is connected to the physical state of their body. By doing what I do I try to teach patients the importance of having the whole body in balance and how this will help patients to deal with their negative experiences in more healthy ways than just burying them inside. So the techniques I use are important to bring the physical system into equilibrium with the emotions so that pain goes away and the quality of life is increased.

Included in the data concerning FMS treatment principles was the subject of the therapists' approach to pain management in FMS. All therapists interviewed in this study reported that when dealing with pain in patients with FMS, their interventions do not focus on pain.

Generally, I try not to use the word pain. I’ll ask questions about discomfort. For example, ‘Are you in any discomfort today?’ And if the patients says they are worse than they were yesterday I ask them what do they think might have caused it. And most of the time it is because they were feeling really good after therapy and decided to go home and clean the entire bathroom. And we talk about this. We talk about how those were different movement patterns and how that was real aggressive and maybe they should have just cleaned the sink and waited to see how they felt before continuing on with the rest.

Additionally, therapists reported that they believed in teaching their patients with FMS healthy ways to deal with the discomfort they experience as a result of FMS. However, the data in this area indicated two major groups of thought that are somewhat different. Some therapists believed that patients should be taught to use the discomfort they experience as positive feedback while others believed that patients with FMS should be taught how to respond to stressful events in their lives more positively.

At this facility we teach people to love their pain. In essence that’s true because we try to let the individual know that pain is a feedback and if you’re doing something that hurts maybe you should stop and try it a different way or take a break and come back to it later. So we are getting
them in tune to their bodies. A lot of these people have shut off that mind-body connection and are in tune to task orienting behavior. So we teach them to listen to their body and to use it’s feedback as checkpoints along the way.

I believe that physical therapists are a part of that behavioral approach, because when I treat a patient with chronic pain I am trying to change how they respond to certain events in their lives. For example, let’s say a patient with fibromyalgia is driving down the road and gets cut off. It’s a stressful event. The heart rate increases, their adrenaline increases, they sweat, they may shake. They could grip the steering wheel, push their head forward and grit their teeth, internalizing the event, but that would change their body mechanics and they would have bad posture which would surely increase their pain. So that’s probably not a very good choice. They could come into work and tell their co-workers about the incident which would only make them relive the event and cause them more stress. So that’s not a very good choice. On the other hand, they could take a couple of deep breaths, do shoulder shrugs or rolls, do some chin tucks, put on their favorite music in the care and realize that this stressful event will not ruin their day if they cope with it in healthy ways.

Influencers of Decision-Making

The third factor found to affect the FMS intervention decisions made by physical therapists in the Grand Rapids, Michigan area was personally identified influencers of their decision-making processes. These influencers included physical therapists’ professional experience with FMS, their personal experience with FMS, the needs of patients with FMS, and consultation with other physical therapists and multidisciplinary team members. From the data, two key factors emerged that physical therapists reported as influencing their decision-making in FMS management. These key factors are professional experience through treatment of patients with FMS and continuing education courses and their own personal experiences with FMS.

My experiences with my patients has really influenced the way that I think about fibromyalgia. After so many years of dealing with patients, you know that their pain is real and that they have real physical disabilities as a result of it.
Then, about 10 years ago I went to this seminar on myofascial release. And I really got turned onto the techniques. I talked with other therapists there who had used it to treat chronic pain with a lot of success. I started adding myofascial release in addition to the other things I was using when I treated patients with fibromyalgia and I noticed a change right away.

Well, one of the big things that influenced me was I have a family member who has fibromyalgia. Over the years, she has been to several different physical therapists, but they all seemed to have a passive approach. They treated her pain only. None of the therapy programs she went through focused on function or treated her actively and she never has improved.

Other factors that influenced physical therapists’ decision-making in FMS management include the needs of the patient, and consultation with other physical therapists and the multidisciplinary team.

Well, I think I just look at the patient before me and make decisions based on the needs of the patient. It’s more like when I see the diagnosis of fibromyalgia I already have in my mind what I know tends to work with these patients based on my experiences. So I just change it a little bit according to the tolerance of the patient and their own needs.

I think working in a pain clinic and working with a team have really given me great experience to know what to do with these patients. You know the team is a resource and it helps to go to the team when I am thinking of changing the program for the patient.

They give me their perspectives of the situation from the point of view of their own professions and it helps to know how my decisions may or may not affect the rehab of one patient in other areas. It is kind of like a checks and balances system and it really helps us to make sure that our decisions are appropriate.

Process of Decision-Making

The fourth factor found to affect the FMS intervention decisions made by physical therapists in the Grand Rapids, Michigan area was the process of decision-making. None of the physical therapists interviewed in this study could identify a specific process by which they made decisions in FMS management. However, most of the therapists
reported that in general they use the patient interview combined with past patient experiences and prior knowledge of FMS management in their decision-making.

In the beginning I talked with other therapists to figure out what worked and didn’t work. As my own experiences with patients increased then I began to draw from that and from my own opinions as to what is the best treatment.

You get clues in the interview about their function, past experiences, how they handle stress, stuff like that. The information guides you and gives you an idea of what things they can handle and how you are going to talk to them.

FMS Interventions

Although all therapists believe that multidisciplinary intervention is necessary in FMS management, differing beliefs are evident as to the role of exercise and modalities in FMS interventions, the role of the physical therapist in FMS interventions, and interventions that are less optimal than others.

Role of Exercise and Modalities

With regard to the role of exercise and modalities in FMS interventions, most therapists reported that they emphasize a program that focuses on functional movement and aerobic exercise, using modalities only when necessary as an adjunct to their interventions. However, one therapist reported using a program that emphasizes pain relief through modalities with limited application of functional movement and aerobic exercise.

I tend not to focus a lot on hands on stuff like massage, ultra sound, strain-counterstrain, myofascial release. You can go down the line with that stuff. I use it, but only when I need to because I think using those types of modalities really hurts the patient. I don’t mean physically hurts them, well I guess it can if you consider using those types of passive treatments enables the patient to remain inactive in the whole rehab process.

You notice that my program is void of any hard exercise. Unless I have a patient that has an endurance problem that is not helped with what I do, I
normally don’t use the traditional cardiovascular training. The patients that I see with fibromyalgia are motivated and driven people. They have no problem jumping right back into their busy schedules once they are no longer inhibited by physical and emotional pain.

Those that reported using interventions that emphasized functional movement and aerobic exercise prescribe a moderate intensity aerobic exercise program that ranges from 60%-70% of the age-predicted maximum heart rates of their patients with FMS, although one therapist supported the use of a self-paced aerobic activity program. The reported frequency of exercise is between 3 to 4 times a week. Additionally, most therapists supported ambulation as the optimal mode of exercise as it is inexpensive, no equipment is needed, and can be performed in any environment. The use of an aquatic program that focuses on self-paced aerobic activity within a heated pool was also reported by one therapist. The physical therapists interviewed in this study also reported emphasizing proper body mechanics, diaphragmatic breathing, and biomechanically correct work stations during their interventions. With regard to strength training, most therapists reported that they focus on functional strength training with low weight (5 to 10 pounds) and low repetitions (3 to 10 repetitions) to avoid triggering exacerbations.

Physical therapists also varied in their beliefs regarding their role in FMS intervention. Most of the therapists interviewed in this study believe their role is to assist the patient with FMS in self-managing their syndrome. On the other hand, one therapist believes that the role of the therapist is to heal patients with FMS.

At the beginning of therapy I was very clear with this patient about the fact that we both needed to work together and that my job was not to cure her or even take away her pain. My job is to help her help herself learn how to live and function again.

Then, my job as a physical therapist is to restore the fascial system of the patient to help release the tension and the force of that tension on the body that causes pain.
Lastly, variation was found in data collected on the beliefs held by physical therapists about interventions that are less than optimal. Most physical therapists reported that they believe that a passive approach to treatment is less than optimal for patients with fibromyalgia. However, one physical therapist believed that focusing on functional gains and de-emphasizing symptom management are not beneficial to patients with FMS.

I think a passive approach where a P.T. just goes in and gives them a massage, hot pack, and ultra sound and sends them home with a home exercise program is inadequate to help these people.

...and most of the time my patients with fibromyalgia don’t need to be trained on how to physically function. What I try to treat is the underlying factors that have led to the pain that has caused their inability to function.

Additionally, all of the therapists interviewed reported that they believe a treatment program that lacks a multidisciplinary approach is least beneficial for patients with FMS.

I’ve known a lot of P.T.’s that think fibromyalgia can be treated with physical therapy alone. Physical therapy only treats one aspect of the disease.

So I really believe that chronic pain programs that use a multidisciplinary, behavioral approach and that are equipped to deal with these patients long term are best...

Decision-Making in the Absence of Guidelines

The first research question also addresses the absence of physical therapeutic treatment guidelines in FMS intervention. All of the physical therapists interviewed during this study reported that they felt they were able to make intervention decisions in FMS management without formal guidelines.

I have my formal education in P.T., my knowledge of chronic pain, and my skills and experiences treating chronic pain. So, I feel I am able to make good decisions without the protocols. I think P.T. is an art. You
can't standardize treatment or make up protocols when every patient is different, especially with chronic pain.

Development of Protocols

Furthermore, all of the therapists interviewed believed certain changes need to be made in the field of physical therapy before formal treatment guidelines can be constructed. These changes include a better understanding of FMS, more research on FMS, and improved knowledge in chronic pain interventions.

I don’t really buy into that whole protocol thing for fibromyalgia. I think it’s too complex and there’s too little really known about the cause of it. I mean, there’s not really any hard evidence that tells us if P.T. works, ...I think right now we know so little really about fibromyalgia. I mean that’s why every therapist uses a different management program for fibromyalgia. So, I think until more is know about fibromyalgia, protocols would not be helpful.

The other thing would have to happen is that physical therapists would have to get a lot more education about how to deal with patients with chronic pain. I really don’t think we are given that much training on dealing with chronic conditions in general and that’s why treating fibromyalgia is such a challenge for so many therapists. I think once therapists have more training in chronic pain they will be able to agree more on what things work for these patients so that guidelines can be made for other therapists.

Judgments of Effectiveness of FMS Interventions

The second research question in this study deals with how physical therapists in the Grand Rapids, Michigan area judge the effectiveness of their FMS intervention decisions in the absence of FMS treatment guidelines. The data collected that was linked to this research question revealed two main factors. Physical therapists reported that they judged the effectiveness of their FMS intervention decisions according to either their clinical findings or through consultation with other physical therapists and the multidisciplinary team.
Judge Effectiveness According to Clinical Findings

Within the theme of clinical findings, therapists reported judging the effectiveness of their FMS intervention decisions according to patient function, reassessment of the patient, and their record of progress notes.

I think the biggest thing I use is function. In fibromyalgia there are no tests or numbers you can use to measure outcome. So I use function. I keep track of what things the patient would like to do that they can’t. As their function increases they should be able to do more activities or be able to do them for longer periods of time, or be able to do them with less soreness.

And of course there is also my reassessment of the tender points and other tests that I found to be positive upon my initial assessment, but typically with fibromyalgia patients there are not a lot of objective things to reassess because normally they have good range of motion and normal neurologic tests and so on, so I look at their daily function.

And so on, but it’s your notes that really tell you if you are consistently making good decisions when it comes to patients, especially because patients with fibromyalgia tend to want to please you and may not tell you the whole truth. So, every once in a while you go over the notes of the last few patients you have treated and review their courses of treatment to see if the decisions you made were effective and made in a timely manner.

Judge Effectiveness Through Consultation with Others

Physical therapists interviewed in this study also reported that they judge the effectiveness of their FMS interventions according to consultation with other physical therapists and the multidisciplinary team.

I use other therapists kind of like a sounding board to make sure the decisions I make follow what we know about fibromyalgia. Talking with other therapists helps me to hear my plans of care and by saying my rationale out loud for my treatments it really helps me to form a concrete reason for using a particular set of treatments. And if the patients show progress and I am able to verbalize my reasons for choosing my plans of care, then I feel I am being pretty effective.

You know the team is a great resource and it helps to go to the team when I am thinking of changing the program for the patient. It is kind of like a
checks and balances system and it really helps to make sure that our decisions are appropriate.

Physical Therapists’ Self-Assessments

The third and final research question asked in this study concerns how physical therapists perceive their personal ability to manage patients with FMS. Two major themes revealed in the data dealing with physical therapists’ personal ability to manage patients with FMS were physical therapists’ perceptions of their intervention decisions and physical therapists’ perceptions of the provision of care they provide their patients with FMS.

Perceptions of Intervention Decisions

Overall, most of the physical therapists interviewed believed they make effective intervention decisions in the management of FMS. Although, one physical therapist seemed to convey some reservation.

So I guess my answer is that I don’t feel 100% confident in the decisions I make, but until there is more consensus in P.T. about treatment and new research tells me otherwise, I will continue to treat my patients according to what I know has worked with my other patients. And it is hard to make decisions because there are so many different approaches that you can take to fibromyalgia treatment, but I think you have to go off of the available research, talk and listen to others and compare their experiences and knowledge to your own, and then make your decisions taking everything into consideration knowing your own beliefs and values. That’s the best you can do.

Perceptions of Provision of Care

Additionally, all of the physical therapists interviewed in this study reported that they felt they provided good standards of care to their patients with FMS.

I think I have pretty good abilities to manage fibromyalgia because I work together with a team. I don’t think I would ever want to try to manage a patient with fibromyalgia with only physical therapy. Physical therapy is an important part of the overall treatment, but it is not the one and only
answer. I think I do a good job helping patients become aware of the physical manifestations of their emotional conflict and if nothing else happens that still puts them in a better situation than not knowing. I think because I am able to work with the team and time my interventions to match the breakthroughs that happen with the patient I am able to manage my part well.
CHAPTER 5
DISCUSSION AND IMPLICATIONS

Discussion of Findings

The purpose of this study was to explore some of the concepts under which physical therapists in the Grand Rapids, Michigan area operate when treating patients with FMS. The goal of this research based on the purpose was to provide clearer insight into FMS physical therapeutic management. To achieve the purpose, the following questions were explored in this qualitative study: (a) How do Grand Rapids, Michigan area physical therapists determine FMS interventions in the absence of treatment guidelines?, (b) How do physical therapists in the Grand Rapids, Michigan area judge the effectiveness of their FMS intervention decisions in the absence of FMS treatment guidelines?, and (c) How do physical therapists in the Grand Rapids, Michigan area perceive their personal ability to manage patients with FMS?

Determination of FMS Interventions

The data collected from the interviews of the physical therapists participating in this study were placed into seven categories relating to the three research questions (see Figure 2 for diagram of research results). The categories relating to the first research question that dealt with how physical therapists determine FMS interventions in the absence of treatment guidelines were factors affecting decision-making, specific FMS interventions, and decision-making in the absence of guidelines.
Figure 2. Diagram of research results
Factors Affecting FMS Decision-Making

In this study several factors were found to affect the decision-making of the physical therapists interviewed including physical therapists' beliefs about FMS, physical therapists’ FMS treatment principles, personally identified influencers of their decision-making processes, and physical therapists’ process of decision-making in FMS intervention.

Physical Therapists' Beliefs about FMS

Within the theme of physical therapists’ beliefs about FMS, although much variation exists about the relationship of sleep deprivation, stress, genetic factors, and negative/stressful life events to FMS and its development, the results revealed that all of the physical therapists interviewed believe that these factors are linked to FMS. Additionally, although therapists differed on the deconditioned state theory of pathoetiology, all of the therapists interviewed believe that the muscle stiffness and pain associated with FMS may be linked to factors such as stress and sleep deprivation.

According to studies conducted by Ahles, Yunus, Riley, Bradley, and Masi (1984) and Uveges et al. (1990), both the development and exacerbation of FMS are associated with the occurrence of major life stressors. These researchers also found that patients with FMS reported more frequent and more severe daily agitations than other patients with differing types of rheumatic diseases. Another study researching the relationship between FMS and psychological factors found that 70% of patients with FMS describe themselves as “unduly anxious” and 68% reported their symptoms were made worse by anxiety and mental stress (Yunus e. al., 1981). Additional studies have found that patients with FMS report more psychological distress than patients with rheumatoid arthritis (Ahles et al.,
1984; Wolfe et al., 1997; Payne et al., 1982), other patients with rheumatic diseases (Uveges et al., 1990; Payne et al., 1982), or healthy controls (Ahles et al., 1984). Overall, these therapists' beliefs reflect a trend in the literature that FMS is influenced by both external and internal factors such as stress, trauma, genetic predisposition, infection, physical conditioning, and mental and social health (Adams & Sim, 1998; Yunus, 1992; Zimmerman, 1991).

In addition to these perceptions of FMS pathoetiology, the therapists interviewed in this study believe that patients with FMS have a specific personality type that is universally displayed in FMS and is different from other patients with chronic pain. Furthermore, physical therapists interviewed in this study believe that FMS is often used as a 'garbage pail diagnosis' for patients with symptoms of vague chronic pain. Although there is a lack of research in the area of patient personality characteristics and FMS, evidence that FMS is a difficult syndrome to diagnose does exist. According to Potts and Silverman (1989), it may take patients several years between the onset of FMS symptoms and the verification of the diagnosis, requiring patients to consult several physicians who may have dismissed their concerns, supplied an incorrect diagnosis, or labeled them as hysterical, hypochondrial, or malingering.

Physical Therapists' FMS Treatment Principles

Given these physical therapists' perceptions that FMS is a poorly diagnosed, complex disease involving psychological factors, physical factors, and specific personality traits, it is not surprising that the results revealed strong support for a multidisciplinary approach as a principle of treatment in FMS. Studies have shown that after receiving multidisciplinary treatment, patients with FMS had a decrease in
perceived pain (Nielson, Walker, & McCain, 1992), decrease or no change in the number of tender points (Bennett, 1993; Mason, Goolkasian, & McCain, 1998), improved psychological measures (Mason et al., 1998), and increased sense of control over FMS (Mason et al., 1998). This evidence supports the fact that the therapists interviewed in this study believe a multidisciplinary approach to be the most beneficial approach to FMS management.

In spite of this support for a multidisciplinary approach as a treatment principle for FMS, the results of the interviews conducted during this study indicated several inconsistencies between other reported principles and the perceptions physical therapists have about FMS. One of the largest themes in this category of treatment principles is the belief that patients with FMS must be active participants in the rehabilitation process, taking responsibility for the ultimate outcome of therapy. Therapists reported that rehabilitation takes place within an environment in which patients are given tools to learn to help themselves cope with FMS. Furthermore, most of the therapists interviewed in this study believe their role as physical therapists is to assist the patient with FMS in self-managing their syndrome. However, if patients with FMS have a controlling, over-achieving personality, it seems that the idea that patients with FMS must learn how to take responsibility for their own rehabilitation process reinforces behaviors that may have hindered their ability to deal with stress and anxiety.

Additionally, there is no consensus among the physical therapists interviewed that a functional approach or a symptom-management approach to FMS management is most optimal. Physical therapists are also divided on thoughts regarding the goals of therapy. Half of the therapists believed that the goal of therapy should be return to function while
the other half believed the goal should be equilibrium of the body systems. These conflicting views correspond with research that has provided numerous opposing recommendations for the physical therapeutic rehabilitation of patients with FMS. One researcher recommends symptomatic treatment over moderate physical activity (Buckelew, 1989), while others recommend restoration of function, rather than pain relief as the primary goal of FMS physical therapeutic management (Scudds & Li, 1997). Still, another researcher recommends a combination of both pain management and functional capacity improvement as the most optimal (Krsnich-Shriwise, 1997). According to the results of this study, the balance between achieving improvement in functional activity and addressing symptom management in FMS physical therapeutic management is unknown.

In spite of these opposing beliefs, all therapists interviewed indicated that they do not focus on pain when dealing with patients with FMS. Therapists conveyed that they tend not to use the word “pain” in their interactions with patients, preferring to use the words “discomfort”, “irritation”, or “sore” instead. Although physical therapists in this study believed that therapy should not be pain-centered, they differed on the techniques that should be used to achieve this goal. Half of the therapists said that they encourage patients to use their pain as feedback to guide their participation in activities. On the other hand, half of the therapists believed patients should be taught how to make stress-relieving choices in response to aggravating events. It seems according to the information provided by the therapists interviewed in this study and from available research (Nielson et al, 1992; Masi, 1994) that some form of psychotherapeutic approach to rehabilitation that focuses on increasing functional activity, and symptom management through a
combination of modification of life stresses and body awareness may provide the most comprehensive approach to FMS management.

Influencers of Decision-Making

The third factor found to affect the FMS intervention decisions made by physical therapists interviewed was personally identified influencers of decision-making. All of the therapists identified both their professional experience and their personal experience as the key factors that influence how they make decisions in FMS management. One study conducted by Williams (1989) found a positive correlation between the ability to recognize illness behavior and the amount of physical therapy experience. Askew et al. (1998) found that the longer physical therapists are in practice the more proficient they become at obtaining quality information during an initial evaluation. In the same study, 89% of therapists interviewed felt that their own experiences with pain affected their perceptions of their patients’ pain. Furthermore, Askew et al. found that both professional and personal experience have a direct effect on therapists’ perception and management of patients with chronic pain. The physical therapists interviewed in this study ranged in physical therapy professional experience from 4 years to 25 years, which may explain the variations in perceptions of FMS and differing FMS treatment principles. Nevertheless, it is evident that the experiences of the therapists interviewed in this study are related to their perceptions of FMS, and their FMS treatment principles, influencing the decisions that are made in their management of patients with FMS.

Process of Decision-Making

An interesting factor found in this study is that none of the physical therapists interviewed indicated a specific process by which they make decisions in FMS
management. This, again, may be due to the experience of the physical therapists interviewed in this study. According to Linder (1990), as physical therapists gain experience, they make decisions more on 'instinct', which is a combination of past experience, keen observation, and self-reflection rather than any formalized path of decision-making. Additionally, all of the physical therapists interviewed reported that they felt they were able to make intervention decisions in FMS management without formal guidelines, citing reliance upon their professional experiences and their knowledge, skills, and education. According to Linder (1990), the high degree of comfort that the therapists in this study displayed with regard to decision-making in the absence of treatment guidelines is characteristic of professionally mature clinicians.

Specific FMS Interventions

The FMS interventions described by the physical therapists interviewed in this study are reflective of their own perceptions of FMS and their personal and professional experiences with FMS. All of the therapists interviewed supported treatment using a multidisciplinary team. Furthermore, the majority of therapists believe that interventions emphasizing functional movement and moderate intensity aerobic exercise should be used in the rehabilitation plan of care. The physical therapists in this study recommended moderate intensity aerobic exercise in the form of ambulation ranging from 60%-70% of the age-predicted maximum heart rates of their patients with FMS with a frequency of exercise between 3 to 4 times a week. This exercise prescription corresponds with recent studies in the area of moderate aerobic exercise in FMS treatment that indicated patients with FMS are capable of moderate intensity aerobic exercise from a range of 60% to 80% of their maximum heart rate for 20 minutes 2 to 3 times a week, with a training effect.
achieved for up to three months (Martin et al., 1996; Buckelew et al., 1998; Gowans, deHuek, Voss, & Richardson, 1999; Lemley & Meyer, 2000; Mannerkorpi, Nyberg, Ahlmen, & Ekdahl, 2000; Ramsay et al. 2000). Ambulation was referred to as the optimal mode of exercise for patients with FMS most often by the therapists interviewed in this study. Ambulation, according to Barco and Peters (2001) is inexpensive, requires no equipment, and can be performed in any environment, providing a realistic mode of treatment that can be continued at home after therapy has ended.

Judgments of Effectiveness of FMS Interventions

Physical therapists' judgments of the effectiveness of their decision-making directly related to the second research question in this study. Physical therapists reported that they judged the effectiveness of their FMS intervention decisions according to either their clinical findings or through consultation with other physical therapists and the multidisciplinary team. In this category, the results indicated that those therapists with less experience in the field consult with other professionals concerning the effectiveness of their interventions, while those with more experience rely on their own clinical findings. This is consistent with research that has found a physical therapists' experience is directly related to the ability to effectively interpret evaluative findings (Williams, 1989; Askew et al., 1998).

Physical Therapists' Self-Assessments

Physical therapists' perceptions of their own decision-making and provision of care for patients with FMS were linked with the third research question of this study, which dealt with physical therapists' perceptions of their abilities to manage patients with FMS. All of the physical therapists interviewed in this study, with the exception of one,
believed they make effective intervention decisions in the management of FMS, and all of the physical therapists believe they provide good standards of care to their patients with FMS. This information contrasts with the findings of Wolff, Michel, Krebs, and Watts (1991) that 75% of therapists felt they were inadequate at managing patients with chronic pain. Additionally, Wolff et al. found that physical therapists believe that patients with chronic pain will remain disabled in spite of physical therapeutic intervention. The small sample size and the fact that all of the subjects in this study have had years of experience working in pain clinics may account for this difference.

Application to Practice

This study was designed to explore some of the concepts under which physical therapists operate when treating patients with FMS in order to provide a starting point for better understanding the physical therapeutic management of FMS. Based on the findings of this study, there are several recommendations that can be offered to physical therapists to improve their understanding of FMS management. The first is that FMS is a poorly diagnosed, complex syndrome that involves psychological factors, physical factors, and possible specific personality characteristics. As such, patients with FMS may be best treated from a multidisciplinary perspective to effectively manage the syndrome. Second, a psychotherapeutic intervention approach that includes improvement of functional activity and moderate intensity aerobic exercise balanced with symptom management through a combination of modification of life stressors and body awareness education should possibly be considered in the physical therapeutic management of patients with FMS. Lastly, physical therapists' professional and personal experiences were found to
have a direct effect on their decision-making and ultimate management of patients with FMS.

**Limitations**

Based upon the study design, procedure, and sample population some limitations were identified. One is the lack of direct observation of the physical therapists treating patients with FMS. Without this dimension of data, it was difficult to obtain the complete nature of therapists' perceptions, beliefs, and interventions used in FMS management. The lack of direct observation of physical therapists treating patients with FMS also prevented comparisons between information given in interviews and actions during patient treatment from being obtained. Additionally, due to time constraints, participants were not given the opportunity to review transcripts of their interviews and follow-up interviews were not conducted, subtracting from the trustworthiness of the study.

Because this study contained a bias, considering only therapists working in pain clinics that made use of multidisciplinary, systems approach to patient management, the data is skewed toward the theme of multidisciplinary treatment. Consequently, differing approaches to FMS physical therapeutic management using other frameworks of practice were not explored. This lack of negative case report data detracts from the depth and richness of data needed to provide dimension to the study. Nevertheless, subjects interviewed had varied backgrounds of practice and references were made to experiences with patients with FMS that occurred at facilities other than pain clinics. These contrasting backgrounds served to add some variation to the emergent patterns of data.

The process through which the sample was chosen for this study may also be a limitation. The inclusion criteria for this study included a self-identified use of a
multidisciplinary, systems approach to FMS management. The use of a key informant increased the likelihood that subjects obtained for the study used a multidisciplinary, systems approach in their everyday practice. Nevertheless, a telephone directory was also used to identify possible sampling sites from which subjects were ultimately obtained. Although they may have expressed the use of multidisciplinary, systems approach to FMS management, subjects obtained using a telephone directory may not have actually used a multidisciplinary, systems approach to FMS management as defined in this study. The use of a telephone directory to obtain subjects for the study may limit the strength of the conclusions in this study.

**Suggestions for Further Research/Modifications**

Future studies including larger samples with physical therapists from multiple practice settings in which patients with FMS are often seen such as orthopedic outpatient and sports medicine settings need to conducted in order to more fully explore the concepts under which physical therapists operate when managing FMS. Additionally, the inclusion of therapists from multiple practice settings would allow researchers to determine if practice setting is related to FMS intervention decision-making. A future study could also be conducted on patients’ perceptions of provisions of care. This would allow for comparison of both physical therapists’ perceptions of the effectiveness and quality of care they provide patients and the patients’ perspectives of that same care as a base for establishing effective clinical management strategies. Additionally, the physical therapists interviewed in this study seemed to express some hesitance as to the development and use of formal protocols for FMS intervention, seeming to place their confidence in their professional and personal experiences rather than evidence-based
material. Future research exploring the areas from which physical therapists receive their authority when making decisions may help to clarify this issue. Another suggestion for further research is in the area of intervention outcomes. Well-controlled and defined, long-term studies are needed on the outcomes of various physical therapeutic interventions to help clarify optimal exercise prescription, the role of modalities, and the role of functional training in FMS management.

**Conclusions/Summary**

Because patients with FMS frequently seek physical therapeutic intervention, reliable and effective physical therapeutic treatment protocols are needed. However, the establishment of a physical therapeutic management protocol for FMS remains a challenge. This in part may be due to the complex nature of the syndrome, lack of consistent research, and absence of generic treatment guidelines for FMS. This study was designed to explore some of the concepts under which physical therapists operate when treating patients with FMS in order to provide physical therapists with a starting point for better understanding the physical therapeutic management of FMS. This research revealed that in this sample physical therapists' perceptions of FMS and their professional and personal experiences affect FMS intervention decision-making and perceptions of the effectiveness of decision-making with regard to FMS management. In addition, this sample of therapists believe that a multidisciplinary team intervention including a physical therapy program that balances improvement of functional activity, moderate intensity aerobic exercise, and symptom management may be beneficial for patients with FMS. However, additional studies are needed to examine this area further.
and bring greater understanding of FMS to physical therapists that will ultimately facilitate the development of FMS physical therapeutic treatment guidelines.
References


HUMAN SUBJECTS CONSENT FORM

You are being asked to participate in a research study entitled “Physical Therapists’ Perceptions Concerning the Determination of Fibromyalgia Interventions: A Qualitative Study”. The purpose of this study is to 1) explore how physical therapists determine interventions for the treatment of Fibromyalgia Syndrome and to 2) explore how physical therapists judge the effectiveness of their intervention decisions 3) how physical therapists perceive their personal ability to manage FMS. This study is being conducted through the Grand Valley State University Physical Therapy program. Elizabeth Jayne Levengood is the principle investigator for this research.

In order to be included in this study:
• You must be a licensed physical therapist
• You must currently be working in a Grand Rapids, Michigan area pain clinic
• You must have at least 3 years’ professional experience in the field of physical therapy
• You must have at least 2 years’ experience working in a Grand Rapids, Michigan area pain clinic
• You must have experience treating at least 25 or more patients a year with at least a secondary diagnosis of fibromyalgia syndrome (a secondary diagnosis of fibromyalgia syndrome is defined as the presence of medically diagnosed fibromyalgia syndrome in conjunction with another impairment that a patient is receiving treatment for).
• You must be involved in a multidisciplinary approach to fibromyalgia syndrome management (multidisciplinary approach is defined as the involvement of several professionals from differing disciplines that provide separate and unique treatment according to the needs of the patient).
• You must have a systems view of patient interaction (systems view is defined as the interaction of physical, emotional, and spiritual internal factors of the patient and the interactions of those factors with each other and the environment, society, and world at large).

After signing the Human Subjects Consent Form, you will be interviewed by the principle investigator, Elizabeth Jayne Levengood. Immediately prior to the interview, information on your age, credentials, number of years of experience in the field of physical therapy, and number of years of professional experience working in Grand Rapids, Michigan area pain clinics will be recorded on a Participant Demographic Sheet. The information recorded on this sheet will be used to describe the research sample, however; at no time will your individual identities be revealed. The principle investigator will then conduct a semi-structured interview lasting approximately one-hour in length.

STATEMENT OF CONFIDENTIALITY
For the purposes of this research the interview will be audiotaped, and transcribed by a professional medical transcriptionist.
HOWEVER, in order to protect the information given, at no time will identifying characteristics of yourself or of the facility in which you work be used during the
interview, and all identifying characteristics will be removed from transcripts. Transcriptions of the interview will be sent to you for review of information to ensure accuracy. The members of the research team and you will be the only individuals reviewing the transcripts. Elizabeth Jayne Levengood and three research committee members will be the only people allowed access to the data collected in this study. Audiotapes and transcriptions of data will be stored in a secure file and kept for the duration of the study, and then destroyed to protect confidentiality. Although quotes from the interview may be used in the final research report, your identity will not be disclosed in any publications resulting from this research project.

- Interviews will take place at a time and place convenient to you, the subject being interviewed
- Participation in this study is voluntary and you may withdrawal at any time without any penalty of any kind.
- The results of the study will be made available to you upon request.
- A copy of the signed Human Subjects Consent Form will be given to you.

I acknowledge that:

The principle researcher has personally reviewed this Human Subjects Consent Form with me. The principle researcher has given me the opportunity to ask questions about this research study and those questions have been answered to my satisfaction. I also have been given the opportunity by the principle researcher to refuse to participate in this study and am aware of my rights to withdrawal from this study at any time without any penalty of any kind. I am aware that my personal identifying information will be kept confidential at all times during this research.

If you have any additional questions regarding this research project please contact
Research Committee Chairwoman, Karen Ozga, P.T. (616) 895-2679
Principle Researcher, Elizabeth Jayne Levengood, (616) 901-8125

If you have any questions about your rights as a research participant that have not been answered by the investigator, you may contact the Grand Valley State University Human Subjects Review Committee Chair, Paul Huizenga (616) 895-2472.

I hereby authorize the principle researcher to release information obtained in this study to scientific literature at Grand Valley State University. I have read and understand all information provided in this document. I agree to participate in this study.

Signature of Participant, Date,

Signature of Witness, Date,
ORIGINAL INTERVIEW QUESTIONS

A semi-structured interview lasting approximately one-hour will be conducted by the principle researcher. Participants will be allowed to guide the direction of the interview. A variety of prompts will be used to ensure that complete answers to the questions are captured. The following interview questions will form the framework of the first interview. Additional questions may be added to this framework as a result of within-interview data analysis.

Introduction to Interview

"Over the last few years, conflict has existed concerning what types of physical therapeutic interventions are most optimal in fibromyalgia syndrome management. This seems mainly to be due to the fact that there are no formal published guidelines for fibromyalgia treatment and unclear research as to what constitutes optimal fibromyalgia management. During this interview I would like to explore how you determine interventions in the management of fibromyalgia syndrome, how your judge the effectiveness of your intervention decisions in fibromyalgia, and how you perceive your ability to manage fibromyalgia in the absence of formal fibromyalgia treatment guidelines. I hope by conducting this study to provide clearer insight into fibromyalgia intervention and management."

Questions

1) What are your thoughts regarding the pathoetiology of fibromyalgia?

2) What are your thoughts regarding the management of fibromyalgia?
   **Prompt 1**: What is the best way in your opinion to manage patients with fibromyalgia?

2a) How have you come to these decisions?

2b) What has influenced how you make decisions about interventions in the management of patients with fibromyalgia?

3) How do you feel about making decisions about fibromyalgia interventions when there are no formal treatment guidelines?

4) How do you judge the effectiveness of your decisions in fibromyalgia interventions?

5) Describe an experience you had treating a patient with fibromyalgia that stands out to you.
Prompt 1: Describe your role in the management of this patient.

"Now I would like to ask you some questions related to the patient case you just shared."

5a) How did you decide on the interventions you used with this patient?

5b) How do you feel about the decisions you made during your care of this patient?

5c) How do you feel about your abilities to manage FMS?

6) Do you have anything else you would like to add with regard to the management of fibromyalgia?

7) Do you have any questions for me?
ADDITIONAL INTERVIEW QUESTIONS

Two questions formed from within interview analysis I and II. No questions formed from cross interview analysis I and II. One prompt formed from cross interview analysis I, II, III.

Question list after interviews I, II, III:

1) What are your thoughts regarding the pathoetiology of fibromyalgia?
   Prompt 1: Are there any theories of pathoetiology that you do not agree with? (From cross interview analysis I, II, II)

2) What are your thoughts regarding the management of fibromyalgia?
   Prompt 1: What is the best way in your opinion to manage patients with fibromyalgia?

2a) What process do you use to make decisions about the treatment of your patients with fibromyalgia? (Reworded to be more specific)

2b) What is it about the decisions you have made regarding your patients with FMS that has allowed your management program to be successful? (NEW from interview I)
   Prompt 1: Talk about how you make decisions in exercise prescription for pt's with fibromyalgia. (Formed from interview I and II to address uncertainty in literature about ex. prescription).

2c) What has influenced how you make decisions about interventions in the management of patients with fibromyalgia?

3) How do you feel about making decisions about fibromyalgia interventions when there are no formal treatment guidelines?

3a) What are your thoughts regarding the development of formal treatment guidelines for FMS? (From interview II to address lack of formal treatment guidelines)

4) How do you judge the effectiveness of your decisions in fibromyalgia interventions?

5) Describe an experience you had treating a patient with fibromyalgia that stands out to you.
   Prompt 1: Describe your role in the management of this patient.
“Now I would like to ask you some questions related to the patient case you just shared.”

5a) How did you decide on the interventions you used with this patient?

5b) How do you feel about the decisions you made during your care of this patient?

5c) How do you feel about your abilities to manage FMS?

6) Do you have anything else you would like to add with regard to the management of fibromyalgia?

7) Do you have any questions for me?
PARTICIPANT DEMOGRAPHIC SHEET

You are being invited to provide information to the following questions. The data collected from these questions will be used to describe the research sample in this study, but all individual identities will not be revealed.

Please answer the following questions to the best of your ability in the spaces provided.

1) How old are you?

2) What kind and level of college degree do you have?

3) What professional licenses or certification do you hold?

4) What are the total number of years you have been working as a licensed physical therapist?

5) How many years have you been working in a Grand Rapids, Michigan pain clinic?

6) What other areas of physical therapy have you worked in?
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#### SIMILAR CONCEPT GROUPS

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**Note:** Underlined headings in the “Emergent Patterns” column indicate all groupings of data included from the “Similar Concept Groups” headings in addition to new data added to each emergent pattern listed under the various emergent pattern headings.
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Note. Numbered headings in the "Summary of Emergent Patterns" column represent the final summary of data. Information under each final summary heading represents data from various emergent patterns.
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#### SUMMARY OF EMERGENT PATTERNS

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Note. Each of the seven final categories represents data that was summarized from the "Emergent Pattern Summary" and linked with the three research questions of this study. Final categories 1., 2., and 3. were linked to the first research question dealing with the determination of FMS interventions in the absence of guidelines. Final categories 4. and 5. were linked to the second research question dealing with judgments of effectiveness of FMS interventions. Final categories 6. and 7. were linked to the third research question dealing with P.T. self-assessments.