I, Arianne M. Davis

hereby submit this work as part of the requirements for the degree of:

Master of Education

in:

Health Promotion and Education

It is entitled:

DIFFERENCES AMONG EXERCISE SELF-EFFICACY, PREVIOUS EXERCISE EXPERIENCE AND EXERCISE BEHAVIOR AMONG FIBROMYALGIA SUPPORT GROUP MEMBERS

This work and its defense approved by:

Chair:   Amy L. Bernard, Ph.D., CHES

Liliana Rojas-Guyler, Ph.D., CHES
DIFFERENCES AMONG EXERCISE SELF-EFFICACY, PREVIOUS EXERCISE EXPERIENCE AND EXERCISE BEHAVIOR AMONG FIBROMYALGIA SUPPORT GROUP MEMBERS

A thesis submitted to the
Division of Graduate Studies and Research
of the University of Cincinnati

in partial fulfillment of the requirements for the degree of

MASTER OF EDUCATION

in the Division of Human Services
of the College of Education

2007

by

Arianne M. Davis

B.S., Wilmington College, 2002

Committee Chair: Dr. Amy L. Bernard, Ph.D., CHES
Abstract

AN ABSTRACT OF THE THESIS FOR THE MASTER OF EDUCATION DEGREE IN HEALTH PROMOTION AND EDUCATION, PRESENTED ON JANUARY 15, 2007 AT THE UNIVERSITY OF CINCINNATI, OHIO.

TITLE: DIFFERENCES AMONG EXERCISE SELF-EFFICACY, PREVIOUS EXERCISE EXPERIENCE AND EXERCISE BEHAVIOR AMONG FIBROMYALGIA SUPPORT GROUP MEMBERS

MASTERS COMMITTEE MEMBERS: Dr. Amy L. Bernard (Chair), Dr. Liliana Rojas-Guyler

The purpose of this study was to determine if there was a difference among exercise self-efficacy, previous exercise experience and exercise behavior among fibromyalgia support group members. It was hypothesized that exercise self-efficacy would be higher among FMS support group members who currently exercise compared to those who do not, and that there would be a positive relationship between exercise participation before and after fibromyalgia diagnosis.

There was a significant difference in exercise self-efficacy and exercise participation level (p<.001). Participants who exercised post-diagnosis reported better exercise self-efficacy scores than those who did not exercise.

The results regarding exercise behavior before and after diagnosis indicate that fewer individuals are exercising after their diagnosis with fibromyalgia. While the data was not significant, there was an obvious trend towards exercise attrition after diagnosis, reinforcing the need to address exercise with this population.
Acknowledgements

Thank you to Dr. Bernard and Dr. Rojas-Guyler for their support and understanding of my pursuing a career and completing this research synonymously.

Everyone at Lees-McRae College, Thank You:
My extended family, the entire Athletic Training Education Program.
Rita Smith, Dr. Blassingame, Dr. Wyatt, and Dr. Carson –
What is “child’s play” to one is a monumental endeavor to another.
Renee, thanks for being my sounding board.

My family, who are too numerous to name individually,
thank you for the ongoing encouragement and love.

To my husband, Jason, thank you for making our life together so amazing. You have made our marriage, pregnancy, and now the first few months of our son’s life indescribable. Your patience, endless hours of ‘single-parenting’ so that I could work on research, and support are unlike anything I have ever experienced.
I love you.
To my son, Ian, know that you can accomplish anything you so desire.
Mommy loves you!
# TABLE OF CONTENTS

Abstract.........................................................................................................................i

List of Tables...............................................................................................................vi

List of Figures..............................................................................................................vii

Chapter 1: The Problem..............................................................................................1
  Statement of the Problem.........................................................................................15
  Hypotheses..............................................................................................................16
  Delimitations..........................................................................................................16
  Limitations.............................................................................................................17

Chapter 2: Review of Literature..............................................................................18
  Introduction ............................................................................................................18
  Importance of Fibromyalgia..................................................................................18
  Related Topics.......................................................................................................20
  Treatments of Fibromyalgia..................................................................................24
  Importance of Exercise with Fibromyalgia..........................................................26
  Self Efficacy..........................................................................................................29
  Self Efficacy and Exercise.....................................................................................31
  Exercising with Fibromyalgia...............................................................................36

Chapter 3: Methods..................................................................................................42
  Sample Selection....................................................................................................43
  Survey....................................................................................................................45
  Data Analysis........................................................................................................46

Chapter 4: Results and Discussion.......................................................................48
  Response Rate.......................................................................................................48
  Demographics......................................................................................................48
  Research Questions...............................................................................................52
  Hypotheses............................................................................................................62
  Discussion.............................................................................................................65

Chapter 5: Conclusion and Recommendations...................................................67
  Conclusions............................................................................................................68
  Discussion.............................................................................................................69
  Recommendations for Practice..........................................................................74
  Limitations............................................................................................................75
  Recommendations for Future Studies.................................................................77
References..................................................................................................................78

Appendices..................................................................................................................83
  Appendix A: Survey Instrument.................................................................84
  Appendix B: IRB Approval Documents..........................................................88
  Appendix C: Support Group Administrator Scripts...................................91
  Appendix D: Information Sheets.....................................................................94
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Symptoms of Fibromyalgia</td>
<td>4</td>
</tr>
<tr>
<td>Table 4.1</td>
<td>Demographic Data</td>
<td>50</td>
</tr>
<tr>
<td>Table 4.2</td>
<td>Background Data</td>
<td>51</td>
</tr>
<tr>
<td>Table 4.3</td>
<td>Exercise Behaviors</td>
<td>54</td>
</tr>
<tr>
<td>Table 4.4</td>
<td>Reasons for Exercising</td>
<td>55</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Factors Impacting Exercise</td>
<td>58</td>
</tr>
<tr>
<td>Table 4.6</td>
<td>Exercise Self-efficacy Score</td>
<td>60</td>
</tr>
<tr>
<td>Table 4.7</td>
<td>Exercise Self-efficacy Question Score</td>
<td>61</td>
</tr>
<tr>
<td>Table 4.8</td>
<td>Exercise Self-efficacy and Exercise Behavior</td>
<td>63</td>
</tr>
<tr>
<td>Table 4.9</td>
<td>Exercise Behavior</td>
<td>64</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>I</td>
<td>Tender points for diagnosis of Fibromyalgia</td>
<td>5</td>
</tr>
</tbody>
</table>
Chapter One

The Problem

Definition

Fibromyalgia is a controversial condition with even more controversial treatment suggestions. Much of the controversy surrounding fibromyalgia originates from the fact that there is no known cause and that symptoms vary from patient to patient and throughout the course of the illness (Stonecypher, 1999). This has lead to difficulty defining this disease, and thus diagnosing it. A range of definitions has been published by a variety of researchers:

- “fibromyalgia syndrome (FS) is a noninflammatory disorder characterized by prominent symptoms of diffuse pain and specific tender points found on physical examination.” (Siegel, Janeway & Baum, 1998, p.377).
- “the diagnosis of fibromyalgia rests on a combination of unspecific symptoms and signs and is not an etiologically based entity” (Götze, Thid & Kyllerman, 1998, p.384).
- “fibromyalgia is a form of non-articular rheumatism characterized by long term (>3 months) and widespread musculoskeletal aching, stiffness, and pressure hyperalgesia at characteristic sites, called soft tissue tender points” (Van West & Maes, 2001, p.522).

The most recent definition from the National Fibromyalgia Association (NFA), and the one that will be used for this study, states that fibromyalgia is a “chronic pain illness which is characterized by widespread musculoskeletal aches, pain and stiffness, soft tissue tenderness, general fatigue and sleep disturbances. The most common sites of pain include the neck, back, shoulders, pelvic girdle and hands, but any body part can be
involved. Fibromyalgia patients experience a range of symptoms of varying intensities that wax and wane over time” (2005, p. 1).

Symptoms

According to the NFA, fibromyalgia “is characterized by the presence of multiple tender points and a constellation of symptoms” (2005, p.1). The three most predominant symptoms are pain, fatigue and sleep problems (NFA). Refer to table I.

Pain. The pain associated with fibromyalgia involves deep muscular aching and can also be characterized by throbbing, twitching, and stabbing or shooting sensations. Neurological complaints such as numbness, tingling and burning may accompany the pain in some patients (NFA, 2005). Meisler (2000) showed classic presentation of symptoms including pain in the chest or lower back, with radiation down the leg. Krsnich-Shriwise (1997) noted paresthesia, Raynaud’s phenomenon (30%), chest pains, swelling and numbness in the extremities may be reported. Siegel, and colleagues (1998) listed diffuse pain, stiffness (79%), subjective swelling (61%), paresthesia (36%), and in that particular study population found stiffness (77%), changes with weather (67%), and paresthesia (63%) consistent with other studies. Paresthesia may be, “any subjective sensation, experienced as numbness, tingling, or a ‘pins and needles’ feeling. Paresthesias often fluctuate according to such influences as posture, activity, rest, edema, congestion, or underlying disease” (Anderson, 1998, p.1209).

Fatigue. The fatigue associated with fibromyalgia is a complete exhaustion that interferes with daily living. Fatigue often compromises the patient’s ability to function mentally and physically (NFA, 2005). A study by Siegel et al. (1998) found that 91% of
fibromyalgia patients reported extreme fatigue, 81% in that particular study population. Excessive fatigue was also reported by Krsnich-Shriwise (1997) and Meisler (2000).

Sleep. The sleep problems of fibromyalgia patients prevent them from getting deep, restorative, stage 4 sleep. During sleep, individuals with FM are constantly interrupted by bursts of awake-like brain activity, limiting the amount of time they spend in deep sleep (NFA, 2005). Between sixty and ninety percent of fibromyalgia patients reported sleep disturbances (Meisler, 2000; Siegel et al., 1998; Krsnich-Shriwise, 1997). Siegel et al. (1998) found 75% had sleep disturbances, 67% had poor sleep, while 100% reported waking up feeling tired. Krsnich-Shriwise (1997) found 60-90% reported nonrestorative sleep with morning fatigue.

Other Symptoms. A variety of other symptoms are also common in fibromyalgia patients including “irritable bowel and bladder, headaches and migraines, restless legs syndrome (periodic limb movement disorder), impaired memory and concentration, skin sensitivities and rashes, dry eyes and mouth, anxiety, depression, ringing in the ears, dizziness, vision problems, raynaud's syndrome, neurological symptoms and impaired coordination” (NFA, 2005, p.1).

Other commonly reported complaints were headaches that may be associated with nausea, difficulty concentrating or sitting still, bowel irregularities (affecting 40% of patients), and frequent urination with discomfort (Meisler, 2000). Krsnich-Shriwise (1997) adds chronic tension and migraine headaches (28-58%), bowel and bladder irritability (34-53%), dysmenorrhea (painful menstruation), anxiety, and depression (20%). Siegel et al. (1998) finds consistent figures, including headaches (54%), and
irritable bowel syndrome (27%). Associated symptoms with prevalence in the study population were headaches (53%), anxiety (48%), and others (Siegel et al.) (see Table 1).

Table I

Symptoms of Fibromyalgia

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Krsnich-Shriwise N=not available</th>
<th>Siegel et al. N=45</th>
<th>Wolfe et al. N= 558</th>
<th>Yunus &amp; Masi N=35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>20%</td>
<td>22%</td>
<td>48%</td>
<td>-</td>
</tr>
<tr>
<td>Changes with Weather</td>
<td>-</td>
<td>36%</td>
<td>67%</td>
<td>-</td>
</tr>
<tr>
<td>Depression</td>
<td>20%</td>
<td>43%</td>
<td>32%</td>
<td>-</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>30%</td>
<td>36%</td>
<td>41%</td>
<td>-</td>
</tr>
<tr>
<td>Headaches</td>
<td>28-58%</td>
<td>71%</td>
<td>53%</td>
<td>54%</td>
</tr>
<tr>
<td>Pain</td>
<td>-</td>
<td>93%</td>
<td>98%</td>
<td>-</td>
</tr>
<tr>
<td>Paresthesias</td>
<td>30%</td>
<td>24%</td>
<td>63%</td>
<td>36%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>60-90%</td>
<td>62%</td>
<td>81%</td>
<td>91%</td>
</tr>
<tr>
<td>IBS</td>
<td>34-53%</td>
<td>38%</td>
<td>30%</td>
<td>27%</td>
</tr>
<tr>
<td>Raynaud’s</td>
<td>30%</td>
<td>13%</td>
<td>17%</td>
<td>-</td>
</tr>
<tr>
<td>Sleep Disturbances</td>
<td>-</td>
<td>96%</td>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td>Stiffness</td>
<td>-</td>
<td>53%</td>
<td>77%</td>
<td>79%</td>
</tr>
<tr>
<td>Swelling</td>
<td>-</td>
<td>40%</td>
<td>-</td>
<td>61%</td>
</tr>
<tr>
<td>Waking up feeling tired</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100%</td>
</tr>
</tbody>
</table>

Diagnosis

Because there are no laboratory tests associated with fibromyalgia, the outward expression of these signs and symptoms is the basis of diagnosis. Physicians must rely
on patient histories, symptom reporting, and a manual tender point physical examination. The manual tender point physical exam is based on criteria developed by the American College of Rheumatology (ACR). “To receive a diagnosis of FM, the patient must meet the following diagnostic criteria: 1) Widespread pain in all four quadrants of the body for a minimum duration of three months, and 2) Tenderness or pain in at least 11 of the 18 specified tender points when pressure is applied” (NFA, 2005, p.1) (See Figure 1).

Figure I. Tender points for diagnosis of Fibromyalgia (NFA, 2005)

Etiology

As stated previously, the cause of fibromyalgia is unknown. There have been numerous theories for the cause of fibromyalgia, but none have yet to be substantiated.
Onset of fibromyalgia is possibly the least understood factor of the condition. Stonecypher (1999) suggests that many patients are unable to identify the cause. Meisler (2000) and Stonecypher agreed that viral, flu-like, or severe febrile illness might be a source. Meisler, Stonecypher, and Staud and Domingo (2001) also suggest that physical trauma is suspect, with automobile accidents, sports related trauma, and unspecified trauma, as the leading sources.

VanWest and Maes (2001) list a variety of other hypotheses for the cause of fibromyalgia, which include: inflammatory disorder with neuroendocrine-immune system changes, dysfunction of the serotonergic system, psychiatric disorder related to major depression, muscle abnormalities, energy depletion in muscles, mechanical abnormalities of cervical or lumbar spine, or resulting from aberrant central pain mechanisms.

The psychological or neurotic cause has frequently been blamed. This theory however does not explain how a psychological disorder could cause the 18 identifiable tender points (Wootton, 2000). Along the physiologic path, Thurston (1999) suggests that, decreased tryptophan concentrations, serotonin depletion, increased Substance P levels, altered muscle tissue microcirculation, cell damage within muscles, and lack of voluntary muscle strength may contribute to development of fibromyalgia. Deprivation of stage 4 non-rapid eye movement (NREM) or delta wave sleep is a current area of focus (Thurston; Siegel et al., 1998). Important secretions occur during stage 4 sleep. Without sufficient time in this phase, lower levels of growth hormone and somatomedin C are released (Thurston; Siegel et al.). VanWest and Maes (2001) also note significant falls in cortisol levels with exercise.
VanWest and Maes (2001) state that the, “biophysics of fibromyalgia has remained elusive and the treatment remains mainly empirical” (p.522). Correct diagnosis and effective treatment are crucial. Cardol, DeJong, Van Den Bos, Beelen, De Groot and De Haan (2002) emphasize it best by reminding that the, “medical uncertainty, invisibility and questions surrounding the justification of the diagnosis ‘fibromyalgia’ can make it difficult for people to cope” (p.33). As a result of the lack of etiology for fibromyalgia, more recent research has moved its focus from an empirical basis to a neurophysiological basis (Forseth & Gran, 2002).

**Prevalence of Fibromyalgia and Demographic Characteristics of Fibromyalgia Patients**

Oliver and Cronan (2002), and Wootton (2000) report that 3 to 6 million Americans suffer from fibromyalgia. To put fibromyalgia pain into perspective, Mellegard, Grossi and Soares (2001) state that, “50% to 80% of the general population has experienced an episode of back pain during their lifetime. In 90% of the cases the pain resolves within 3 to 4 months, but 2% to 10% of the patients develop chronic conditions” (p.103-4). It is these chronic conditions that manifest widespread pain, a highly reported symptom of fibromyalgia. There are some common demographic characteristics of fibromyalgia patients.

**Age.** VanWest and Maes (2001) state that onset of symptoms occurs between 20 and 40 years of age. Meisler (2000) also suggested that prevalence increases with age, and that a greater percentage of 50-60 year olds may be affected.

**Socioeconomic Status, Nationality, and Ethnicity.** Macfarlane, McBeth and Silman (2001) suggest that widespread pain does not vary by social class and identified the prevalence in a one-month period to be 9-10%. Additionally, nationality does not
seem to impact widespread pain. Richards and Scott (2002) reported the, “medically unexplained chronic widespread musculoskeletal pain has a community prevalence of 11-13% in the United Kingdom” (p.185). The association between widespread pain, tender points and fibromyalgia has a community prevalence of 1% (Richards & Scott). “From epidemiology studies, we know that fibromyalgia occurs at similar levels around the world, indicating that this syndrome is not a disorder specific to developing countries, nor is it a racially selective disorder” (Meisler, 2000, p. 1055).

Gender. The final concern with fibromyalgia is the statistics among women. The general population in 1996 showed that 2.5% had fibromyalgia, which is approximately 3.5% of females and 1% of males (Meisler, 2000). Thurston (1999) found that it occurred “predominately in women (90%), it is estimated that 15-20% of patients seen in rheumatology clinics have (fibromyalgia), making it the 2nd most commonly diagnosed rheumatic disorder after rheumatoid arthritis” (¶2). Côté (1999) presented a female to male diagnosis ratio of 7 to 1. This makes the jobs of the females’ physician much more challenging. It is critical to distinguish among disorders and provide a correct diagnosis. In doing so, effective treatment may begin sooner, allowing a patient to recover as completely as possible. In addition to the difficulty in diagnosing fibromyalgia, symptoms overlap those of other conditions, and when combined, affect approximately 4 million females between 30 and 50 (Meisler).

Heredity. Another area to be addressed is the possibility of heredity as a source of the condition. Stonecypher (1999) noted that no pattern had been identified, but that there is support that relatives of those with fibromyalgia have higher prevalence than the general population.
Impact of Fibromyalgia

The fact remains, fibromyalgia is a growing condition with growing costs. A Canadian insurance company reported an increase in fibromyalgia related claims of over 200% during the mid 1990’s with almost 200 million dollars paid out each year by insurance companies (Côté, 1999). Some of these claims may be related to inability to work. Côté identified lower performance and productivity as well as frequent absences as consequences of fibromyalgia on work. This inability to work spurs many other complications in a patient’s life.

These include economic problems, as demonstrated by Staud and Domingo (2001) who found that annual expenses for outpatient and clinic visits, with an average of 10 visits per year, cost fibromyalgia patients over $2,200. Additionally, up to 25% of these patients are considered disabled, challenging their daily life and compromising social interaction, including family problems, and feeling isolated (Forseth & Gran, 2002; Staud & Domingo, 2001; Côté, 1999). Research suggests that disability for over six months to a year results in more challenges when attempting to return to work (Côté).

Health Concerns

Macfarlane et al. (2001) wrote that widespread pain symptoms were markers for poor health with other possible complications. Regardless of which theories regarding the cause of fibromyalgia are true, it is a condition with consequences. Macfarlane et al. noted that widespread pain alone could be associated with increased mortality, consistent with the non-disease death rates that were three to five times higher in participants with regional and widespread pain.
Mortality was lowest in those who originally reported no pain (10.1 per 1000 person years) and increased across regional pain (13.1/1000 person years) groups. The mortality in both the regional pain (mortality rate ratio 1.21, 95% confidence interval 1.01 to 1.44) and widespread pain groups (1.31, 1.05 to 1.65) remained significantly increased after adjustment for age group, sex, and study location (Macfarlane et al., p. 2).

Treatment

The early treatment of fibromyalgia was purely with medication. Cyclobenzaprine, nortriptyline, and amitriptyline are still the most commonly prescribed muscle relaxants and antidepressants (Siegel et al., 1998). Forseth and Gran (2002) agree with Richards and Scott (2002) who state that, “analgesics, non-steroidal anti-inflammatory drugs and antidepressants is relatively ineffective” (p.185). Today, educational programs and exercise are combined with medication for comprehensive treatment (VanWest & Maes, 2001). Bailey, Starr, Alderson and Moreland (1999) recommend education about smoking, support groups, and optimizing medication.

Learning to cope with the pain of fibromyalgia is another focus of treatment. Many patients actually have a fear of the pain and avoid physical activity which may precipitate pain (Mellegard et al., 2001). As time passes, the patient learns which specific activities cause pain, and find ways to modify or avoid only those with presumptive therapy (Siegel et al., 1998). One such method is to frequently move about. Côté (1999) and Offenbächer & Stucki (2000) state that avoiding static positioning decreases pain and increases the amount of time that activity may occur.
Once again, the psychological factor is also of concern. “Especially in people with long-term illness, emotional support perhaps should form a more regular part of rehabilitation interventions” (Cardol et al., 2002, p.33). Without psychological support, depression may worsen, a patient may become isolated, or they may exceed their limitations doing things which compromise their physical health (Meisler, 2000). One mentioned method is active versus passive coping. Mellegard et al. (2001) explained that active coping incorporated problem solving and attempts to relieve or control pain while passive coping focuses on praying and hoping, and avoiding activity. Additionally, passive coping results in lower self-efficacy scores. Bailey et al. (1999) said that, “self-efficacy has been linked to pain and impairment in fibromyalgia” (p.337).

Exercise as a treatment of fibromyalgia is proving to be very effective. Da Costa, Dobkin, Dritsa and Fitzcharles (2001) recommend that exercise improves depressed moods. Possibly the most frequently recommended treatment is obtaining the encouragement of others. “Encouragement and positive attitude were offered by 13 patients (e.g. “Have a positive outlook,” “Hang in there,” “Believe in yourself,” etc), followed in frequency by the advice to exercise (10 patients)” (Siegel et al., 1998, p.380). Treatments must include reassurances that any setbacks in progress can be overcome (Siegel et al.).

Multitudes of treatment combinations exist in the available research. Some include medication, moderate exercise, anti-inflammatory drugs, pain management, massage therapy, physical therapy, relaxation techniques, and various cognitive behavioral therapies such as depression programs, enhancing self-efficacy, support groups, and patient education (Siegel et al., 1998; Meisler, 2000; Forseth & Gran, 2002;
Oliver & Cronan, 2002). Thurston (1999) reminds people that, “the primary goal of the treatment program for (fibromyalgia) is to give the control of the patient’s life back to the patient” (¶18).

With the lack of scientific data to identify fibromyalgia as a disease, it is difficult to recommend treatments. Various treatment attempts have been made using drugs, physical therapy, psychological therapy, and modalities. Previous research supports the use of exercise as one of the most effective treatments of fibromyalgia. McCain, Bell, Mai, and Halliday (1988), Nichols and Glenn (1994), and Norregaard, Lykkegaard, Mehlsen, and Danneskiol-Samsoe (1997) studied the effects of cardiovascular fitness, while Burckhardt, Mannerkorpi, Hedenberg, and Bjelle’s 1994 study focused on patient education with exercise in women (Thurston, 1999).

Côté (1999) states that the World Health Organization (WHO) has recognized fibromyalgia since 1993. Wootton (2000) even reported that the National Institutes of Health have taken an interest in proving that fibromyalgia exists. But recognition is only part of the challenge. As fibromyalgia diagnoses are more efficiently made, effective treatments must be implemented. The need for further research and a consistent diagnostic tool is evident if the treatment of fibromyalgia is to be effective.

**Self-Efficacy**

Bandura’s (1997) Social Cognitive Theory and its fundamental concept of self-efficacy are strongly associated with initiation and adherence to exercise behavior. The, “…beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Self-efficacy, the confidence people have in their capability to attain a specific performance, plays an
influential role in determining what tasks people attempt, how much effort is expended on those tasks, and how long they persevere when they encounter difficulties (Bandura, 1986, 1997). Wise and Trunnell (2001) discovered that, “people with a strong sense of efficacy attempt new tasks, expend greater effort, and persevere longer than those who are not as efficacious” (p. 268).

**Exercise Self-Efficacy**

Some controversy exists regarding the impact of psychological theories on exercise behavior. Over the years, it has been shown that self-efficacy and exercise are strongly correlated (Katula & McAuley, 2001; Ostir, Cohen-Mansfield, Leville, Volpato & Guralnik, 2003; Duncan & McAuley, 1993, Sallis et al, 1989). Essentially, people with low exercise motivation or a negative attitude toward the benefits of exercise are more likely to have low levels of exercise self-efficacy. Those who exercise had improved perceptions of their aerobic fitness compared to non-exercisers in a study by Yin and Boyd (2000).

Resnick, Palmer, Jenkins & Spellbring (2000), and Prohaska and Glasser (1994), noted that older populations had lower self-efficacy. Additionally, females had lower self-efficacy and higher outcome expectations (Grembowski et al, 1993). Other impacting factors include mental and physical health. Impaired physical health and high levels of mood disturbances have negative affects on self-efficacy (Resnick et al.).

Self-efficacy is not only correlated to, but is predictive of exercise behavior (Sullum and Clark, 2000; Leveille, Cohen-Mansfield & Guralnik, 2003; Bandura, 1997). It is suggested that people choose tasks they perceive themselves capable of handling (Grembowski et al., 1993). Successful completion of tasks reinforces a person’s ability
Bandura’s (1997) suggestion that the social cognitive theory and self-efficacy expectations impact subjective states was demonstrated by Wise and Trunnell’s (2001) finding that women’s perceptions of efficacy were impacted by their performance and Resnick et al’s (2000) statement that females and older participants had lower self-efficacy and outcome expectation compared respectively to their counterparts. Rodgers, Hall, Blanchard, McAuley & Munroe (2002) also noted that the frequency of activity is able to be distinguished using self-efficacy. Treasure and Newberry (1998) noted that in sedentary individuals, “in-task feeling states predicted post-exercise self-efficacy…during a graded exercise test” (p. 9).

Some patients may handle a greater exercise load with little difficulty, thus enhancing exercise self-efficacy. This may also enhance program adherence since new medical problems, number of chronic diseases, and confidence in one’s ability to maintain regular exercise were all found as impacting factors (Tucker & Reicks, 2002; Resnick et al., 2000). Another important consideration is that relapse and attrition rates are approximately 50% within three to six months of exercise program initiation (Sullum & Clark, 2000).

Effects of Exercise

One of the chronic results of fibromyalgia is the tendency to gain weight and become deconditioned. Oliver and Cronan (2002) and Offenbächer and Stucki (2000) identified 80% of fibromyalgia patients reported as physically unfit. As a result, research focusing on the impact of exercise on fibromyalgia has become important. Oliver and
Cronan stated that, “patients participating in an exercise program featuring aerobic, flexibility, and strength training reduced their number of tender points and degree of tenderness and increased their aerobic fitness levels more than a control group” (p.383). One of the important considerations with exercise is a person’s confidence in performing those exercises. Self-efficacy and prior experience exercising appear to be predictors of continued exercise behaviors (Oliver & Cronan).

Another contributing factor is patient compliance. Richards and Scott (2002) state that the “…initial increases in pain and stiffness immediately after exercise and patients believing that exercise worsens the condition” (p. 187) attribute to the cessation of exercise programs. However, the benefits appear to outweigh the limited challenges. Lower depression scores, higher self-efficacy, and larger social support networks (Oliver & Cronan, 2002) contribute to continued exercise. Regardless of the method, effective treatment of this condition is imperative.

Statement of the problem

The purpose of this research is to determine if there is a difference in self-efficacy between exercisers and non-exercisers, and to examine how the exercise behavior of FMS support group members has changed since their diagnosis with FMS.

Research Questions

What factors impact exercise self-efficacy for fibromyalgia support group members?

Are physicians recommending exercise to FMS patients?

What factors limit exercise behavior before and after diagnosis with FMS?
How have the exercise behaviors of fibromyalgia support group members who exercised prior to diagnosis with fibromyalgia changed since their diagnosis with fibromyalgia?

*Hypothesis 1*

Research hypothesis 1: Exercise self-efficacy will be higher among FMS support group members who currently exercise compared to those who do not.

Null hypothesis 1: There will be no difference in exercise self-efficacy between FMS support group members who currently exercise and those who do not.

Alternative hypothesis 1: Exercise self-efficacy will be lower among FMS support group members who currently exercise compared to those who do not.

*Hypothesis 2*

Research hypothesis 2: There will be a positive relationship between exercise participation before diagnosis and exercise participation after diagnosis among participants diagnosed with fibromyalgia.

Null hypothesis 2: There will not be a relationship between exercise participation before diagnosis and exercise participation after diagnosis among participants diagnosed with fibromyalgia.

Alternative hypothesis 2: There will be a negative relationship between exercise participation before diagnosis and exercise participation after diagnosis among participants diagnosed with fibromyalgia.

*Delimitations*

The following are delimitations of this study:

1) Only fibromyalgia support groups listed on databases at:
• Arthritis Foundation:
  http://www.arthritis.org/communities/Chapters/SearchResultsEvents.asp?SortBy=
  Name&key=fibromyalgia&dis=

• National Fibromyalgia Association:
  http://www.fmaware.org/fame%20newsletter/famesupprt_direct.htm

were asked to participate in this study,

2) Only fibromyalgia support group members, 18 or older, whose group administrator
agreed to assist with the study had an opportunity to participate in the study, and

3) Only fibromyalgia support group members present at the support group meetings when
the consent forms were distributed by the support group administrator had an opportunity
to participate in the study.

Limitations

The limitations and assumptions of this study include:

1) The use of support groups as a convenience sample,

2) The honesty of the participants while answering survey questions,

3) Participant recall / memory regarding survey questions,

4) Participant understanding of questions and the terminology used throughout the survey
instrument,

5) Participant perceptions, including those of fibromyalgia, support groups, exercise
before and after diagnosis with fibromyalgia, and exercise self-efficacy, and finally,

6) The number of support group members who attend the meeting, as opposed to the
number of surveys the support group administrator requested.
Chapter Two

Review of Literature

Introduction

Fibromyalgia is a controversial condition with even more controversial treatment suggestions. The general population in 1996 showed that 2.5% had fibromyalgia, which is approximately 3.5% of females and 1% of males (Meisler, 2000). It is an important finding supported by Oliver and Cronan (2002) and Wootton (2000) who reported that 3 to 6 million Americans suffer from fibromyalgia. “The average (fibromyalgia) patient visits an outpatient clinic about 10 times per year at an annual cost of $2,274, and the financial burden of (fibromyalgia) is confounded by a high rate of disability among (fibromyalgia) patients of up to 25%” (Staud & Domingo, 2001, p.208).

Various treatment attempts have been made with drugs, physical and psychological therapies, and modalities. Previous research supports the use of exercise as one of the most effective treatments. Oliver and Cronan (2002) and Offenbächer and Stucki (2000) identified 80% of fibromyalgia patients reported as physically unfit. This demonstrates the tendency to gain weight and become de-conditioned as a result of fibromyalgia. Of great concern with exercise programs are the poor adherence and retention rates (Oliver & Cronan). When consideration of Da Costa, Dobkin, Dritsa and Fitzcharles’s (2001) findings that, women who no longer fulfilled diagnostic criteria were more likely to exercise, it is difficult to justify not participating.

Importance of Fibromyalgia

Staud and Domingo (2001) discovered that symptoms similar to those of fibromyalgia: “lighter pain…of imprecise location and character… and weather
sensitive,” were described by Hippocrates more than 1200 years ago (p.209). In more modern times, fibromyalgia has been distinguished from chronic fatigue syndrome by a patient not knowing anyone else who has similar symptoms since chronic fatigue syndrome occurs epidemically (Meisler, 2000). Effective diagnosis has proven to be very important to the management of fibromyalgia. Meisler wrote that, “in the early 1980s that the symptoms were present for an average of 9 years, and recently, we reassessed the duration and found that the timing had dropped to 1-3 years, indicating that diagnosis is occurring much sooner, which bodes well for treatment” (p.1056).

Thurston (1999) found similar data. Related to the importance of timely diagnosis is awareness of age of onset. Thurston stated that, “age of onset is typically between 29-37 years, however, typical age of medical presentation is 34-53 years” (¶ 1). Future research may identify a trend toward earlier onset and presentation as fibromyalgia is continuing to gain credibility and more concise diagnostic standards.

In addition to diagnosis, the concern of predominance in women is on the rise. Staud and Domingo (2001) recognized a 9:1 ratio between men and women with fibromyalgia when tender points were the lone determinant. When widespread pain was the determinant, the prevalence in women dropped to only 1.5 times that of men (Staud & Domingo). Perhaps some of this may be attributed to the fact that, “chronic generalized pain is up to 13 times more frequent after neck injuries than after lower extremity injuries” (Staud & Domingo, p.209). In women who initially were free from pain during a five-and-a-half year study by Forseth and Gran (2002), the incidence rate for developing pain was 0.58% per year. It is evident, as Siegel et al. (1998) observed, that
women are at greater risk of developing fibromyalgia, increasing the need for effective treatment.

Another area of importance is that of fibromyalgia in children. Siegel et al. (1998) stated that, “fibromyalgia syndrome ranked as the 12th most common new-patient diagnosis identified by pediatric rheumatologists, representing 2.1% of new diagnoses made among children and adolescents in a US pediatric rheumatology clinic disease registry” (p.377). The two differences between adult and child fibromyalgia diagnosis are a high level of sleep disturbance and fewer than 11 tender points (Siegel et al.). Included in this research is the continued search for biochemical abnormalities. Meisler (2000) noted that an abnormality in the central nervous system might be responsible for systemic pain production. With regards to most research, which has focused on treatment of adults, modified treatments may be necessary for younger populations, especially when considering the developmental changes their bodies are experiencing.

The focus should still be placed on the fact that conditions and diseases result in increased morbidity. Cardol et al. (2002) wrote that, “in terms of restrictions in participation, the impact of a disease with ‘mild’ physical disability, such as fibromyalgia, may be underestimated” (p.33). Potentially the most detrimental research is that the effects of fibromyalgia may be cumulative over time (Siegel et al., 1998). The psychological and physiological effects will eventually have an impact on the patient.

Related Topics

“Often misdiagnosed, (fibromyalgia) may be confused with myofascial pain syndrome, polymyalgia rheumatica, polymyositis, hypothyroidism, metastatic carcinoma, rheumatoid arthritis, chronic fatigue syndrome, or systemic lupus erythematosus”
The similarity of symptoms and chronic aspects of the aforementioned conditions offer continual challenges when identifying the correct condition, and even more difficulty when trying to effectively treat an unidentified condition. Another challenge is the multitude of attempts to diagnose the condition with technology. Thurston suggested that there are no anatomic abnormalities, and that laboratory findings, x-rays, electromyography and nerve studies are inconclusive. Low-grade inflammatory processes, muscle membrane abnormalities, paralytic attacks, myopathic disorders such as myofibrillar degeneration, tubular aggregates, myalgias and hyperkalemic periodic paralysis are all questioned sources (VanWest & Maes, 2001; Götze et al., 1998).

Understanding the most fundamental aspects of the condition is key to early diagnosis and effective treatment protocols. For example, Siegel et al. (1998) also found an association with hypermobility syndrome, which overlaps in pain, but not tender points. At the biological level, lymphocytes, serum serotonin, tryptophan, and norepinephrine are of focus (VanWest & Maes, 2001; Stonecypher, 1999). Decreased levels of lymphocytes lower the natural balance of killer activity (VanWest & Maes). Adrenocorticotropic hormone (ACTH), follicle-stimulating hormone (FSH), cortisol, growth factor 1, free liothyronine, and estrogen levels all appear at abnormal levels (Forseth & Gran, 2002). Alteration of chemical balances in a healthy individual would have an adverse effect, which is compounded and exacerbated in unhealthy individuals. Forseth and Gran conclude that most of the hormones are controlled by the hypothalamus, and a single chemical is not to blame. The chemical role in the
development of fibromyalgia needs further research and surely impacts the efficacy of the various treatment options.

Other commonly found conditions are excessive morning fatigue (Gowans et al., 1999) and psychiatric conditions such as poor coping skills (Staud & Domingo, 2001). VanWest and Maes (2001) stated that there was, “a strong co-morbidity between fibromyalgia and major depression, and increased incidence of depressive symptoms in patients with fibromyalgia” (p.522). In relation, the key roles of norepinephrine are, “enhancing awareness, focusing abilities, and putting the brain’s function systems into alert mode” (Stonecypher, 1999, ¶ 14). The link between physiological abnormalities becomes more apparent when evaluating hormone impact on the psyche of patients. Cardol et al. (2002) identified the social environment as an important association to be considered with treatment.

Meisler (2000) stated that depression and anxiety were higher in fibromyalgic women, but not sufficiently to be the source, rather, one of many complications. Support groups provide social interaction with people sharing similar characteristics: an affliction, addiction or condition. Individuals gather in settings perceived as non-threatening and socially supportive. For those with fibromyalgia, support groups may provide the opportunity to find the secure, empathetic, open discussion of experiences, and support they desire (Ahlberg & Nordner, 2006; Dadich, 2006; Grande, Myers, & Sutton, 2006). In a study by Grande et al., demographic analysis showed significance among gender, age, and support group participation. Support Group members are typically females, aged 30 to 62 (Ahlberg & Nordner; Dadich; Grande et al.).
Even more problems arise when the psychological and biological aspects are combined. VanWest and Maes (2001) suggest that depression activates the inflammatory response system. As a result, symptoms like hyperalgesia, anergy, sleep disorders, and increased depression may worsen. “Depression, which shows a high co-morbidity with fibromyalgia, is characterized by activation of the inflammatory response system” (VanWest & Maes, p.522). It is reassuring that exercise has been shown to reduce depression (Gowans et al., 1999).

Some of the distantly related conditions include stroke and rheumatoid arthritis. Cardol et al. (2002) found a common link among those with these conditions and fibromyalgia in relation to their exercise participation. In arthritis patients, pain is localized to the joints while fibromyalgia is diffuse, involves several different body parts, and changes intensity (Meisler, 2000). Fibromyalgia has been identified in 16% of chronic hepatitis C patients, 8% of Lyme disease patients, and was present in 11% of HIV-infected patients, while 41% possibly fulfilled the diagnostic criteria for the condition (Staud & Domingo, 2001). Further research is definitely necessary, but the association of smokers with widespread pain and increased mortality has also been made (Macfarlane et al., 2001).

Related problems with fibromyalgia in women include previous history of chronic peripheral or visceral pain, migraines, interstitial cystitis, noncardiac chest pain, and microvalve prolapse (Meisler, 2000). The greater concern is with the control of symptoms in these women. Pregnancy, menses, menopause, infection, trauma, weather changes, light and sound can cause exacerbations in pain and all other symptoms (Meisler).
Treatments of Fibromyalgia

Exercise. The treatment focus has recently shifted toward adult physical activity levels, specifically theory-driven interventions that may impact activity adoption (Pinto, Lynn, Marcus, DePue & Goldstein, 2001). Effective fibromyalgia treatments are limited, but have included exercise and leisure activities such as swimming or brisk walking as part of a comprehensive treatment (Gowans et al., 1999; Da Costa et al., 2001). The excuses given for lack of exercise include: pain, chronic disease, functional or physical limitations, poor subjective health, perceptions about health behavior, limited finances, and physical and social environments (Leville et al., 2003; Ostir et al., 2003; Tucker & Reicks, 2002). Being too old or overweight was not perceived to pose as great a barrier to activity (Tucker & Reicks). Sedentary lifestyles have been proven to negatively impact health including declines in mobility and higher incidence of chronic disease and disability.

This is supported by the 1996 US Surgeon General report that indicated coronary heart disease, cancers, all cause morbidity and mortality were associated with sedentary lifestyles as well as osteoporosis, diabetes, falls, sleep disorders, depression, decreased cognitive function, and depressed levels of self-efficacy (Hoeppner & Rimmer, 2000; McAuley, Blissmer, Katula & Duncan, 2000; Resnick et al., 2000; Treasure & Newbery, 1998). Regular physical activity may help to improve and maintain independent living, functional performance, and quality of life in older adults, including their eighth decade (Resnick et al; Tucker & Reicks, 2002; Ostir et al., 2003). Even though the benefits of exercise are publicized regularly in today’s society, the Department of Health and Human
Services (1996) found that more than 60% of American adults did not exercise, with 25% not participating in any form of physical activity.

The benefits of exercise extend to diverse populations including the elderly, as well as varying socioeconomic status and educational background (McAuley & Katula, 1998; Ostir et al., 2003; Resnick et al., 2000). “In a study of 1,944 older HMO enrollees, increasing age and less than a high school education were found to have direct effects on lowering exercise self-efficacy” (Ostir et al., p. 266). Mental health was linked indirectly as an influence on self-efficacy expectation (Resnick et al.). Ostir et al., Resnick et al., and McAuley et al. (2000) suggest that improved exercise interventions may occur as a result of an improved understanding of the factors affecting exercise self-efficacy and the ability to control individuals’ exposure in reinforcing and influential environments.

Treasure and Newberry (1998), Tucker and Reicks (2002), and Resnick et al. (2000) identified subjective states associated with exercise, such as the opportunity to socialize, functional ability, improvement in strength and balance, and health maintenance as having a major impact on individuals willingness to adopt more physically active lifestyles. Healthy behaviors are part of an inverse relationship; as confidence in one’s ability to perform behaviors increases, so does their success in changing health-threatening behaviors. “Pain is an obvious deterrent to physical activity, but little is known about its influence on motivational factors for exercise that are associated with readiness to participate in physical activity” (Leville et al., 2003, p.275-6).

Additionally, Macfarlane et al. (2001) wrote that widespread pain symptoms were markers for poor health with other possible complications and noted that widespread pain alone could be associated with increased mortality. Oliver and Cronan (2002) stated that,
“patients participating in an exercise program featuring aerobic, flexibility, and strength training reduced their number of tender points and degree of tenderness and increased their aerobic fitness levels more than a control group” (p.383). Ultimately, this results in lower levels of illness and death (Grembowski et al., 1993).

Importance of Exercise with Fibromyalgia

Thurston (1999) identified a study that compared patients with fibromyalgia to the average fitness level values of the American Heart Association that showed 64% of fibromyalgia patients to be below the average of other women their age, and also reported that they did not exercise at all. Similarly, Offenbächer and Stucki (2000) revealed results of 95 patients, of which, “83% were not engaging in regular exercise, 65% had below average aerobic fitness, 51% perceived themselves to be working at the expected intensity, 29% were unable to reach aerobic threshold but perceived themselves to be working at a higher than expected intensity” (p.78). McCain performed groundbreaking research in 1986 on the role of physical fitness in fibromyalgia. It is more than evident that exercise is important for a healthy life, but is critical when suffering from a morbid condition. Oliver and Cronan (2002) agree that, “exercise is important in the management of fibromyalgia syndrome”(p.383).

As previously discussed, there are many hypothetical causes of fibromyalgia; with each cause is another attempt at treatment. “Very few alternative approaches have been clinically studied, but it is clear that exercise is one of the best nonprescription remedies for improving symptoms” (Meisler, 2000, p.1059). Da Costa et al. (2001), Gowans et al. (1999), and Oliver and Cronan (2002) recognize the positive impacts of exercise on women, such as improved daily functioning and physical well-being, improved anxiety
and general psychological well being. These positive factors seem to outweigh any negative consequences of exercising with fibromyalgia.

One of the specific physical improvements is in the muscles of patients. Stonecypher (1999) stated that micro trauma in deconditioned muscles was a source of pain. Hence, exercising to recondition the muscles relieves some of the symptoms. A concern among patients is that they are already in pain, so exercising would only exacerbate that pain. With this belief, a negative feedback cycle develops. Those in pain avoid activities that may cause more pain, and allow their muscles to atrophy as a result. These muscles inefficiently use fuel, which uses excess energy for the same task that was much more easily completed before (Thurston, 1999). With less energy and weaker muscles, the patient avoids even more activities, allowing the cycle to continue.

This is why Thurston (1999) suggests, “reconditioning muscles with aerobic exercise…(to) increase the resistance of the muscle to micro trauma and improve circulation… which may be responsible for improvements in (fibromyalgia symptoms)” (¶ 6). Thurston also notes that with improved cardiovascular fitness, pain may be reduced by the, “central or peripheral beta-endorphin systems or via the release of adrenocorticotropic hormone (ACTH) or cortisol” (¶ 8). With these physical improvements come psychological improvements. An example is that it improves that patient’s sense of control over their body (Thurston).

Engaging in regular exercise and having higher self-efficacy significantly predict continued engagement in exercise behavior in people with (fibromyalgia). Factors such as age, employment status, depression, education level, self-efficacy for managing (fibromyalgia syndrome) and the size of one’s social network also
demonstrate predictive qualities and can discriminate between those who
regularly engage in an exercise program and those who do not report exercising at
all (Oliver & Cronan, 2002, p.387).

Offenbächer and Stucki (2000) remind us that even without such a debilitating
condition, maintaining a workout regimen is challenging. The intensity of a fibromyalgia
exercise program is still controversial, but one of moderate intensity seems to be the best
recommendation by Da Costa et al. (2001). The average exercise program in the research
consisted of up to 20 participants in a hour long class which meet two or three times a
week for several months with activities that included stretching, strengthening, and
aerobic conditioning (Bailey et al., 1999; Richards & Scott, 2002). The duration of the
exercise program may be more important than the actual activity. Da Costa et al.
suggests that it requires several months for the benefits to accrue, but that dropout rates
exceed 50% within six months. Constant interaction with the patient is necessary to
accommodate their changing needs while exercising.

Such dropout rates should not disillusion anyone wishing to begin exercising.
Stonecypher (1999) and Thurston (1999) agree with the findings in Moldofsky and
Scarisbrick’s 1976 study that tender points could be produced in healthy volunteers,
except those with higher levels of cardiovascular fitness. It is important to remember that,
“rehabilitation treatment in chronic illness ultimately aims to restore a person’s
participation in society, despite persistent sequelae of illness, such as impairments and
disabilities” (Cardol et al., 2002, p.27).
**Self-efficacy**

Bandura’s Social Cognitive Theory and its fundamental concept of self-efficacy are strongly associated with initiation and adherence to exercise behavior. The, “…beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Self-efficacy is the confidence people have in their capability to attain a specific performance. It plays an influential role in determining what tasks people attempt, how much effort is expended on those tasks, and how long they persevere when they encounter difficulties (Bandura, 1997). Wise and Trunnell (2001) discovered that, “people with a strong sense of efficacy attempt new tasks, expend greater effort, and persevere longer than those who are not as efficacious” (p. 268).

There are four influencing factors associated with self-efficacy: the mastery experiences, vicarious experiences, verbal persuasion statements and physiological states, each of which may alter perceptions of self-efficacy (Bandura, 1997). When an attempt is made at a task, that performance becomes a mastery experience. Vicarious experiences occur while observing someone else attempt the task. Particularly interesting is the observation of someone perceived to be an expert attempting a task. Efficacy is altered depending on that other person’s experience. If the person is challenged or unable to complete the task, the observer thinks they will be even less likely to adequately complete the same task.

Conversely, if the task is achieved with little difficulty, the observers’ efficacy may improve by thinking, “if they can do it, I can do it” or “now I have an idea of how it is done.” Persuasive statements function similarly in that a person expressing confidence
in the ability to perform tasks may positively affect others efficacy. Finally, physiological signals, such as the body’s fight or flight responses, may alter efficacy. Individual perceptions of these signals may vary from feeling ready and prepared to feeling fear and anxiety related to the task at hand. “Succeeding at a task provides direct evidence of capabilities and can lead to a stronger sense of efficacy” (Wise & Trunnell, 2001, p. 269; Resnick et al., 2000, p.1310).

The sequence of influencing factors may also have an impact on self-efficacy. Placing stronger sources of self-efficacy before weaker sources is important since it is believed to enhance task performance. Bandura (1997) and Wise and Trunnell (2001) identify vicarious experiences as the most powerful of the four. It is suggested that these experiences demonstrate successful techniques and strategies, thereby preparing the observer for their own attempt at the task. Wise and Trunnell also noted that, “the final efficacy means indicated that people should experience successful performance of a task early in a sequence” (p. 278).

Other forces may impact these influencing factors as well. Physical injury and lack of necessary equipment are two examples suggested by Wise and Trunnell (2001). They also suggest that under these circumstances, it may be necessary to alter the sequence in which the influencing factors are presented in order to maximize efficacy. Similarly, if one of the factors will be impossible to experience, the efficacy information should be increased and conveyed in the form of the remaining factors.

“Self-efficacy is a cognitive mechanism mediating motivation” (Feltz, 1992) which influences subjective states throughout a task and also assists in the maintenance of changed behaviors (Tucker & Reicks, 2002; Treasure & Newberry, 1998). Bandura
(1997) points out that self-efficacy is not about the existing skills one has, rather about what can be done with those skills. Two specific forms of self-efficacy have been distinguished.

Task self-efficacy refers to an individual's confidence in the ability to perform the elemental aspects of a task (e.g., confidence in the ability to walk for 30 minutes at a prescribed intensity (heart rate), while coping self-efficacy, also referred to as self-regulatory self-efficacy by Bandura, refers to an individual's confidence in the ability to perform these tasks under challenging conditions (e.g., confidence in the ability to exercise in spite of environmental demands and challenges) (Rodgers, et al., 2002, p. 406).

**Self-efficacy and exercise**

Some controversy exists regarding the impact of psychological theories on exercise behavior. Pinto et al. (2001) found that, “behavioral or psychosocial theory accounts for 30% or less of the variability in physical activity behavior in intervention trials” (p.2). Yet they then state that there have been significant associations among these same constructs and physical activity, including their predictive value of change in physical activity behavior (Pinto et al.). Also, Leville et al. (2003) state that, “self-efficacy was the only social-cognitive factor to predict adherence 9 months after completion of a 20-week exercise intervention” (p. 281). Self-efficacy and prior experience exercising appear to be predictors of continued exercise behaviors (Oliver & Cronan, 2002).

Over the years, it has been shown that self-efficacy and exercise are strongly correlated (Katula & McAuley, 2001; Ostir et al., 2003; Duncan & McAuley, 1993; Sallis
et al., 1989). Essentially, people with low exercise motivation or a negative attitude toward the benefits of exercise are more likely to have low levels of exercise self-efficacy. Those who exercise had improved perceptions of their aerobic fitness compared to non-exercisers in a study by Yin and Boyd (2000). An interesting observation involving exercise is that the more challenging the circumstances and enhanced the environment, the more positive affect and self-efficacy that may be generated, especially in individuals with increased levels of self-efficacy (McAuley et al., 2000; Treasure & Newbery, 1998). “The findings support a growing body of evidence that efficacy expectations exert an influence on the older adults’ adherence to a regular exercise program” (Resnick et al., 2000, p.1313). Exercise adoption behaviors and self-efficacy were also noted to have increased when physician counseling, self-help information and support materials were provided (Pinto et al., 2001) and post-exercise efficacy was predictable when analyzing reported affective responses during exercise (Treasure & Newbery).

Resnick et al. (2000), Prohaska and Glasser (1994), and Jenkins and Gortner (1998) noted that older populations had lower self-efficacy. Additionally, females had lower self-efficacy and higher outcome expectations (Grembowski et al., 1993). Other impacting factors include mental and physical health. Impaired physical health and high levels of mood disturbances have negative affects on self-efficacy (Resnick et al).

Self-efficacy expectations are, “an individuals’ beliefs in their capabilities to perform a course of action to attain a desired outcome” while specific outcome expectations are, “beliefs that a certain consequence will be produced by personal action” (Resnick et al., 2000, p. 1310). Bandura (1997) also suggests that people perceive their
performance as the determinant of the outcome. Self-efficacy expectations influence the performance and ultimately the outcome.

Wise and Trunnell’s (2001) study made three suggestions. First, in a physical activity setting, participants should demonstrate competence by performing the task as soon as possible. Second, if the participant is unable to perform the task as a result of environment of injury, they should observe successful execution of the task. And finally, the supervisor of the task should provide positive feedback regarding the individual’s ability to perform the task.

Grembowski et al. (1993) suggest that people choose tasks they perceive themselves capable of handling. Treasure and Newberry (1998) recommend finding optimal levels of task difficulty that still allow for positive efficacy affect. Bandura (1997), and Wise and Trunnell (2001) explain that successful completion of tasks reinforces a person’s ability and efficacy. Simply put, in order to increase efficacy, one must have positive, successful experiences (Bandura, 1997).

Self-efficacy is not only correlated to, but is predictive of exercise behavior (Sullum & Clark, 2000; Leveille et al., 2003; Bandura, 1997). Leveille et al. found that “exercise self-efficacy was substantially lower in adults with more pain (trend p= .0001). Low scores in self-efficacy, in the lowest quartile, were found in half of adults with two or more pain sites, compared with 17% of those with no pain” (p. 278). The interrelatedness of self-efficacy and exercise are obvious when considering that perception of success at a task not only improves self-efficacy, but also impacts the effort and persistence dedicated toward the task (Yin & Boyd, 2000; Feltz, 1992). Specifically, “self-efficacy increases as one progresses through the stages of change in exercise
behavior” (Sullum & Clark; Marcus & Owen, 1992). Frequently active, high effort exertion individuals tend to have higher pre- and post-exercise self-efficacy (Yin & Boyd).

Bandura’s (1997) suggestion that the social cognitive theory and self-efficacy expectations impact subjective states was demonstrated by Wise and Trunnell’s (2001) finding that women’s perceptions of efficacy were impacted by their performance and Resnick et al.’s (2000) statement that females and older participants had lower self-efficacy and outcome expectation compared respectively to their counterparts. Rodgers et al. (2002) also noted that the frequency of activity is able to be distinguished using self-efficacy. Treasure and Newbery (1998) noted that in sedentary individuals, “in-task feeling states predicted post-exercise self-efficacy…during a graded exercise test” (p. 9).

“Results indicated that pre-exercise self-efficacy predicted in-task negative affect and post exercise positive affect in the 55% VO2Max condition, and post exercise positive affect in the 70% VO2Max condition” (Treasure & Newbery, 1998, p.3). Ostir et al.’s (2003) study found that “each unit increasing in positive-affect score is associated with a 2.72 increased Odds Ratio (OR) of having high confidence in the ability to do strength and flexibility exercise (95% CI 1.87-5.79, p=.009), a 4.08 OR of high confidence in the ability to do aerobic exercise (95% CI 1.51-11.03, p=.006), and a 2.94 OR of high confidence that symptoms will not worsen with exercise (95% CI 1.12-7.76, p=.03) (p. 270, 2003).” And that there was a significant relationship among at-risk participants and “positive affect and confidence in the ability to perform strength and flexibility exercise (b=0.83, SE=0.23, p=.001) and aerobic exercise (b=0.59, SE=0.28, p=.04), as well as a perception that exercise would not worsen existing symptoms
(b=0.73, SE=0.24, p=.001), adjusting for relevant risk factors” (Ostir et al. p. 272).

However, affect did not appear to be correlated to self-efficacy when observing high-performers (Ostir et al.; McAuley et al., 2000), which “suggests that high positive affect is a component of exercise self-efficacy among those who are at risk for future disability but is less significant for those who are already exercising or who are performing at a high physical level” (p.272). “Self-efficacy change was significantly related to change in positive well-being, psychological distress, and fatigue” (McAuley et al., p. 350).

McAuley et al. (2000), Treasure and Newbery (1998), and Ostir et al. (2003) all found that high-intensity exercise had a greater impact on exercise self-efficacy. One suggested explanation is that, “under extreme levels of intensity, e.g., maximal exercise testing, it is possible that physiological cues become so salient that perceptions of efficacy are completely overshadowed by the physical stress” (McAuley et al., p.343). Treasure and Newbery point out that prescription of maximal levels of exercise should not occur in the adoptive phase of an exercise prescription, as this may result in physical and psychological suffering that may deter the patient from adhering to the program.

Some patients may handle a greater exercise load with little difficulty, thus enhancing exercise self-efficacy. This may also enhance program adherence since new medical problems, number of chronic diseases, and confidence in one’s ability to maintain regular exercise were all found as impacting factors (Tucker and Reicks, 2002; Resnick et al., 2000). “Participants with higher self-efficacy at baseline were less likely to relapse” (Sullum & Clark, 2000).

Another important consideration is that relapse and attrition rates are approximately 50% within three to six months of exercise program initiation (Sullum &
Clark, 2000). “These results suggest that for older adults, interventions of greater intensity that are maintained over longer periods are needed to produce sustained changes in hypothesized mediators, motivational readiness, and levels of physical activity” (Pinto et al., 2001, p.8). Self-efficacy may be influenced by socially supportive group environments as well as verbal messages that reinforce the efficacy building process (McAuley et al., 2000; Bandura, 1997). Treasure and Newbery (1998) and McAuley et al. suggest that exercise results in positive engagement, attention from instructors, and general social interaction that may enhance self-efficacy.

“Low self-efficacy was the only social-cognitive factor that was independently associated with sedentary behavior when all three measures were included in a single logistic regression model (adjusted odds ratio [OR] =2.24, 95% CI 1.12-4.47)” (Leville et al., 2003, p.278). Again, the self-efficacy for individuals without pain was reported as, “50% higher than in those with moderate or severe pain in two or more sites” and “adults who had low self-efficacy and reported pain in two or more sites had more than four times the likelihood of sedentary behavior” results consistent with Bandura’s, that adults with greater numbers of sites and more severe pain had lower levels of physical activity (Leville et al., p.279, 280). Elevated self-efficacy and increases in exercise behavior have been linked by Leville et al., Clark (1999), Jette et al, (1998), and McAuley et al. (2000). However, throughout the existing research, there was no data regarding the prior exercise experiences of any of the patients.

*Exercising with Fibromyalgia*

The research demonstrates that one of the most effective treatments for a majority of fibromyalgia patients is exercise therapy. Richards and Scott (2002) completed a
review of exercise therapy programs in fibromyalgia on Medline and found nine which reported the benefits of the program as lasting for six months or longer. Gowans et al. (1999) recommend moderate intensity exercise for fibromyalgia patients that are considered unfit and deconditioned. A commonly used tool for determining the intensity is the Borg rate of perceived exertion, which measures perceived effort during a six-minute walk test.

Also used is the Arthritis Self-Efficacy Scale (ASES), which shows that higher scores indicate higher self-efficacy (Gowans et al., 1999). Offenbächer and Stucki (2000) agree that self-efficacy is important to the exercise experience, “serving as an important ‘mastery experience’” (p. 80). The power of the mind is critical when beginning an exercise program. Cardol et al. (2002) suggest that experiencing problems and perceiving restrictions are two different things. A patient needs to focus on the actual problems that are causing the restriction perceptions if they are to be overcome. This is why Offenbächer and Stucki, as well as Forseth and Gran (2002), recommend establishing realistic expectations with patients before beginning an exercise program and using a log to track progress. In this manner, the patient will be more likely to continue exercising knowing that visually, they are gradually approaching their goals.

Another critical point is that these patients may not have the ability to complete workouts that a healthy person would perform. Thurston (1999) states that “typically, (fibromyalgia) patients do not tolerate the low-impact aerobic classes that rely on upper body work in order to keep the (heart rate) within the target range, nor do they tolerate the eccentric contractions required during weight training” (¶ 18). Another important
consideration is that many patients have poor hand strength which results in decreased, “grip strength, clumsiness, and dropping objects” (Offenbächer and Stucki, 2000, p.80).

Many exercise programs are offered in clinical rehabilitation settings where exercise equipment is readily available. Côté (1999) also noted that in those settings, there was supervision available to help patients begin and maintain their program. However, Richards and Scott (2002) points out that some patients may be exercising in public facilities where the instructors lack experience with disabled populations. As a result, home exercise programs should be developed so that it is easier for the patient to exercise properly and when it is convenient for them (Thurston, 1999).

Part of the exercise program development is education. Côté (1999) found that, “throughout the program, participants displayed great interest in being educated as to the characteristics of fibromyalgia syndrome” (p.148). Many of these programs demonstrated extended benefits lasting 3 to 12 months (Gowans et al., 1999; Richards & Scott, 2002). Thurston (1999) points out that these patients will experience what is commonly known as delayed-onset muscle soreness (DOMS) when beginning their programs. The difference is that in healthy populations, this only lasts a few days, but in fibromyalgia patients, recovery is much longer. These patients must be prepared to feel this soreness and realize that they must begin exercising very slowly. DOMS is even more severe after eccentric exercises. “Teaching the patient the nature of eccentric work and initially prescribing stretching followed by activities that will minimize eccentric workload will help patients to exercise appropriately” (Offenbächer & Stucki, 2000, p.80). Another consideration is the effect of the lack of stage 4 sleep on exercise. Côté suggests that as a
result of the lack of sleep, the body is more fatigued, and will limit the amount of
exercise in terms of frequency, intensity, and duration.

Possibly the most discouraging factor when trying to begin any exercise program,
healthy or unhealthy, is the current state of the person’s body. Being overweight and
deconditioned makes even low levels of exercise very challenging. Thurston (1999)
agrees with Meisler’s (2000) recommendation of beginning with a, “walk up to 10
minutes or until (the patient) experiences shortness of breath and then increase the time
until they feel better, thereby increasing their aerobic capacity gradually” until they can
perform 20 minutes, three days per week, at 60-70% of their maximum heart rate
(p.1059). Another suggestion is to begin with two short duration exercise segments
during a workout, and increase the duration and intensity as tolerated to a level, “that
(makes) them sweat slightly while being able to talk comfortably in complete sentences”
(Richard & Scott, 2002, p.185-6). When stretching, Thurston reminds that no pain should
be felt, just a slight resistance.

One way to easily measure a patient’s progress is by monitoring heart rates before
and after a six-minute walk (Côté, 1999). Offenbächer and Stucki (2000) suggest a
subjective method as “after a training session there should be a feeling that ‘I could have
done more’ rather than a feeling that ‘I have done all that I can’” (p.79). Regardless, the
types of exercises should vary. In 1996, a study by Martin, Nutting, MacIntosh,
Edworthy, Butterwick, and Cook incorporated flexibility and strengthening elements with
the cardiovascular exercise.

Postural, stretching, low weight, low repetition strength training, and
cardiovascular components are crucial (Thurston, 1999; Côté, 1999). Samples of
cardiovascular exercises include brisk walking, biking, aerobic dancing, isolated body part movements, and pool exercise such as swimming, walking, jogging, step and arm exercises (Thurston; Gowans et al., 1999; Richards & Scott, 2002). Stretching exercises include upper and lower stretches, as well as relaxation, body awareness, yoga, balance, and visualization exercises (Thurston; Richards & Scott).

The results of the various exercises programs show strong support of this treatment route. Gowans et al. (1999) and Côté (1999) showed significant improvement in the six-minute walk distance, 72 meters and .5 miles respectively, upon completion of the programs. Gowans et al., Da Costa et al. (2001) and Oliver and Cronan (2002) found elevated self-efficacy, decreased tender points, improved patient/physician-related global assessment scores, and lowered depression levels and that their workouts improved. Including “measures of functional disability, physical functioning, grip strength, pain severity, social functioning, psychological distress, and quality of life” (Oliver & Cronan, p.383). Additionally, the higher levels of self-efficacy, for both ability to manage fibromyalgia and ability to exercise, were significant determinants of exercise behavior (Oliver & Cronan).

Two areas of concern with exercise programs include the length and intensity, as well as participation in the program. Côté (1999), Gowans et al. (1999) and Da Costa et al. (2001) all discussed the need for moderate to high intensity exercise regimens, ranging from specifics such as ten weeks of three to four hours per day, to monitoring the target heart range. Regarding participation, Richards and Scott (2002) reported that only 53% of the participants attended a third or more of the classes. “While this study confirms that in the short term women are complying with this recommendation, it remains to be
determined whether these rates of physical activity are consistently maintained over time” (Da Costa et al., p.308). An interesting finding was that, “noncompleters tend(ed) to have a 14% higher incidence of traumatic onset” (Bailey et al., 1999, p.338). Understanding the underlying cause of fibromyalgia will make treatment selection much more effective in the future.

Still, the benefits evidently outweigh the risks in the research. There were significant improvements in physical function, 6-minute walk distance, self-efficacy, well-being, global self-rating, tender points count (13% decrease), pain (drop of 57%), morning fatigue, anxiety, depression and knowledge of fibromyalgia management (Gowans et al., 1999; Bailey et al., 1999; Côté, 1999; Richards & Scott, 2002). Exercise predictors include, “younger age, unemployment, and higher exercise self-efficacy” (Oliver & Cronan, 2002, p.385). Again, the psychological factors prove critical. Cardol et al. (2002) said that depression was most important in restricting participation. For a sample that Da Costa et al. (2001) studied, (n=70) depression scores were significantly lower after exercise “(mean=3.24, SD= 1.64, range= 0.66-6.60) compared to baseline (mean= 2.77, SD= 1.89, range= 0-9.08, t= 2.19, p<0.05)” (p. 305). There is a need for future research to focus on compliance, feasibility, long-term effects of physical activity, type of exercises, duration, and the amount of manpower required for the programs to be effective, supported by Richards and Scott; Gowans et al.; Da Costa et al.; Thurston, 1999; Forseth and Gran, 2002.
Chapter 3

Methods

Fibromyalgia is a controversial condition with even more controversial treatment suggestions. Various treatment attempts have been made with drugs, physical and psychological therapies, and modalities. Previous research supports the use of exercise as one of the most effective treatments. Oliver and Cronan (2002) and Offenbächer and Stucki (2000) identified 80% of fibromyalgia patients reported as physically unfit (p.383; p.78). This demonstrates the tendency to gain weight and become deconditioned as a result of fibromyalgia.

Oliver and Cronan (2002) stated that, “patients participating in an exercise program featuring aerobic, flexibility, and strength training reduced their number of tender points and degree of tenderness and increased their aerobic fitness levels more than a control group (p.383). Self-efficacy and prior experience exercising also appear to be predictors of continued exercise behaviors (Oliver & Cronan). It is an important finding since Oliver and Cronan and Wootton (2000) report that 3 to 6 million Americans suffer from fibromyalgia.

The general population in 1996 showed that 2.5% had fibromyalgia, which is approximately 3.5% of females and 1% of males (Meisler, 2000). “The average (fibromyalgia) patient visits and outpatient clinic about 10 times per year at an annual cost of $2,274, and the financial burden of (fibromyalgia) is confounded by a high rate of disability among (fibromyalgia) patients of up to 25%” (Staud & Domingo, 2001, p.208). Additionally, Macfarlane et al. (2001) wrote that widespread pain symptoms were markers for poor health with other possible complications and noted that widespread pain
alone could be associated with increased mortality. The purpose of this research is to
determine if there is a relationship among exercise self-efficacy, previous exercise
experience and exercise behavior among fibromyalgia support group members.

Sample Selection

Participants were members of FMS support groups throughout the United States. The
support groups were obtained from a search of the internet, using the keywords
“fibromyalgia support groups.” The database groups are listed at the following addresses:

- Arthritis Foundation:
  http://www.arthritis.org/communities/Chapters/SearchResultsEvents.asp?SortBy=
  Name&key=fibromyalgia&dis=

- National Fibromyalgia Association:
  http://www.fmaware.org/fame%20newsletter/famesupprt_direct.htm

Systematic random sampling was used to obtain contact information for support groups
listed on these databases. Every other support group selected using this method was
assigned to receive either the electronic copy of the survey or the hard copy of the survey.
These support group leaders were contacted to determine their willingness to distribute
the survey or the online invitation to participate to their members. If they were willing to
participate, they were asked the number of members of their support group. The goal
was to have approximately 1250 support group members complete the hard copy and an
equal number complete the online copy of the survey.

The actual numbers of support group members who were asked to participate in
the study were 1242 to be administered a hard copy of the survey at the beginning of a
support group meeting and 1237 to provide an e-mail address so that they could be sent a
link to take the survey online at surveymonkey.com. The participants who took the hard copy were finished with their responsibilities upon completion of the survey. Participants who had interest in completing the online survey provided an e-mail address on their consent form, then returned the consent form to the administrator. The administrator returned the completed consent forms in the postage-paid envelope to the researcher. The researcher then sent individual e-mails, inviting the participant to complete the survey online at surveymonkey.com, with a direct link to the survey.

Each support group administrator was contacted by telephone if a valid phone number was listed. If contact could not be made via telephone, an e-mail was sent to determine willingness to participate. If the support group administrator was not available by phone, a message was left with another attempt to contact made three business days later, including by e-mail if an address was included on the database. If an e-mail was sent, with no response, another attempt was also made three business days later.

In the initial contact, the researcher explained the purpose of the research, that the administrator was being asked to either administer a hard copy of a survey, or to pass around consent forms on which e-mail addresses would be obtained for an online survey, the time expected for completion of the survey, as well as the request that if selected to administer the hard copy, the survey was to be completed at the beginning of the meeting. Once the support group administrator agreed to participate, the researcher obtained the dates of upcoming meetings and number of support group members. This process was repeated with each group until approximately 2500 participants were accumulated. The available database contacts were exhausted for this study.
Survey

The survey was developed after a thorough review of the literature. This thesis was approved by the Institutional Review Board (IRB) before the study commenced. They survey was tested for face and content validity and stability reliability before distribution. The survey was tested for content validity by a panel of experts which included: Dr. Amy L. Bernard, who has extensive research experience with women’s issues and Fibromyalgia; Dr. Liliana Rojas-Guyler, with research experience in minority and women’s health issues; and Dr. Bradley Wilson, who contributed his expertise in the field of exercise science. The survey was also tested for face validity by: Mrs. Kathryn Yates, who has struggled with Fibromyalgia for fifteen years, and Miss L. Nicole Short, who has struggled with Fibromyalgia and a variety of other conditions for less than five years.

The same copy was tested for stability reliability with selected support groups, which were then excluded from the study. Twenty support group participants were sent the hard copy test survey, and 20 were sent the link to the online test survey. This survey was tested at a two-week interval (.9711).

Hard Copy Survey. After the survey was finalized, the investigator distributed two different survey packets. They included the hard copy packet and the online packet. Each hard copy survey packet included: 1) a letter to the support group administrator with instructions for the administration of the survey including a script to be read to the participants, 2) consent form 3) blank participant survey with instructions, and 4) a postage-paid return manila envelope. Participants read the instructions with the administrator and completed the consent form. The consent forms were collected and
placed in a manila return envelope. After participants completed the survey, they individually placed their survey in another manila return envelope to assure anonymity. Also included on the consent form was space in which participants could provide contact information if they wished to receive a copy of the results. To assure anonymity, the last participant to place their survey in the manila envelope was asked to seal the manila envelope and write the date across the seal. The postage-paid return envelope was then returned to the investigator for analysis.

**Online Survey.** Each online survey packet included: 1) a letter to the support group administrator with instructions for the completion of the consent form, including a script to be read to the participants, 2) participant instruction packet, and 3) a postage-paid return manila envelope. Each participant instruction packet included instructions and a consent form. Participants read the instructions with the administrator and completed the consent form. Also included on the consent form was space in which participants provided an e-mail address to receive an individual invitation to complete the survey online. Participants could provide additional contact information if they wished to receive a copy of the results. The participants were asked to place their signed consent form in the manila envelope. To assure anonymity, the last participant was asked to seal the manila envelope and write the date across the seal. The postage-paid return envelope was then returned to the investigator for inclusion in the online survey invitation. To assure anonymity, the participants were individually e-mailed the link to the online survey.

**Data Analysis**

Survey responses were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 12.0. Once the data entry was complete, analysis with an
independent samples t-test and chi-square were performed to test hypotheses 1 and 2, respectively. The comparison of exercise self-efficacy and exercise among fibromyalgia support group members was evaluated, as well as the comparison of previous exercise experience and exercise behavior among fibromyalgia support group members. Surveys that were missing more than five responses were excluded from this study.
Chapter 4

Results and Discussion

Previous research has predominantly focused on the impact of exercise self-efficacy on exercise behaviors. Little research has addressed the impact of previous exercise experiences on exercise behavior. This study was performed to determine if there is a relationship among exercise self-efficacy, previous exercise experience and exercise behavior among fibromyalgia support group members.

Response Rate

This survey was distributed to fibromyalgia support group members (N=2479). This included 1237 online surveys, which were accessed online at Surveymonkey.com, and 1242 hard copy surveys, administered during support group meetings. There were 191 total responses (7.7%), with 146 completed surveys in this study.

Demographics

Of the participants reporting demographic data, 95% were female, 5% were male. Race/Ethnicity of the sample included 93% Caucasian, 3% Hispanic, 2% Native American, and 1% each Pacific Islander and African American. Support group membership was reported in day, week, month and year increments. Refer to Table 4.1 for demographic data, which included 62% of the participants who had been support group members for 1-year or longer, 18% for 1-month to 1-year, 15% 1-day to 1-week, and 5% 1-week to 1-month (cases where N ≠ 146, are a result of missing data). Every participant (n=137) had completed high school or the equivalent. Of those, 21% had completed only high school, 21% had some college education, 36% had completed an undergraduate degree, and 22% had pursued post-graduate education. The mean age was
53 years (SD=12.600, 21-84). The mean date of first physician visit was 1995 (SD=8.966, 1969-2006) with mean date of diagnosis as 1998 (SD=7.451, 1970-2006) (see Table 4.2).
Table 4.1

Demographic Data

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>5.07</td>
</tr>
<tr>
<td>Female</td>
<td>131</td>
<td>94.93</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1</td>
<td>.74</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Caucasian</td>
<td>125</td>
<td>92.59</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
<td>2.96</td>
</tr>
<tr>
<td>Native American</td>
<td>3</td>
<td>2.22</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2</td>
<td>1.48</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Completed High School</td>
<td>24</td>
<td>20.87</td>
</tr>
<tr>
<td>Some College</td>
<td>24</td>
<td>20.87</td>
</tr>
<tr>
<td>Undergraduate Degree</td>
<td>41</td>
<td>35.65</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>26</td>
<td>22.61</td>
</tr>
<tr>
<td>Support Group Membership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Day to 1-week</td>
<td>22</td>
<td>15.30</td>
</tr>
<tr>
<td>1-Week to 1-month</td>
<td>7</td>
<td>4.86</td>
</tr>
<tr>
<td>1-Month to 1-year</td>
<td>26</td>
<td>18.05</td>
</tr>
<tr>
<td>1-Year or longer</td>
<td>89</td>
<td>61.80</td>
</tr>
</tbody>
</table>
Table 4.2

*Background Data*

<table>
<thead>
<tr>
<th>Category</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of age (21-84)</td>
<td>52.84</td>
<td>12.600</td>
</tr>
<tr>
<td>Years since first physician visit</td>
<td>10.91</td>
<td>8.81</td>
</tr>
<tr>
<td>Range of years (1969-2006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years since diagnosis</td>
<td>8.10</td>
<td>7.30</td>
</tr>
<tr>
<td>Range of years (1970-2006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years from first physician visit to diagnosis</td>
<td>2.92</td>
<td>5.03</td>
</tr>
<tr>
<td>Range of years (1969-2006)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Research Questions

Research Question 1: How have the exercise behaviors of fibromyalgia support group members who exercised prior to diagnosis with fibromyalgia changed since their diagnosis with fibromyalgia?

Exercise Behaviors Before And After Diagnosis

Of the participants, 75% reported exercise behaviors prior to their fibromyalgia diagnosis, with 57% reporting exercise behaviors since their fibromyalgia diagnosis. Participants were asked to identify the type(s) of exercise in which they participated. These types included 76% aerobic, 69% flexibility, and 50% strengthening before, with 85% flexibility, 47% aerobic, and 38% strengthening after diagnosis. The predominant exercise duration was 84% at over 9-months, 8% for 6-9 months, 5% for 3-6 months, and 3% for 0-3 months before diagnosis. Current exercise duration was 66% at 9-months or longer, 15% at 0-3 months, 11% at 6-9 months, and 8% at 3-6 months. The most frequent location for exercising prior to diagnosis was at home (68%), followed by the gym (47%), other (18%), park (14%), and clinic (2%). The most frequent location for current exercise behaviors occurs at home (68%), followed by the gym (31%), other (17%), park (13%), and clinic (6%). Consistent reasons for exercising before diagnosis were weight control 66%, for fun/socialization 42%, other 24%, and disease prevention 11%. Post-diagnosis, these reasons include “other” 63%, weight control 57%, disease prevention 41%, and for fun/socialization 14% (see Table 4.3).

The results indicate that fewer individuals (n=82) are exercising after their diagnosis with fibromyalgia. However, the majority (66%) of those who do exercise, have done so for a duration of 9-months or longer. Strengthening exercises (26% before,
22% after) are consistently the least common exercise type. While flexibility exercises (35% before, 50% after) replace aerobic exercises (39% before, 28% after) as number one after diagnosis.

Exercise locations remained consistent with a slight increase in those exercising at a gym (31%) after diagnosis. Finally, there was a shift in reasons for exercising. Before diagnosis, it was for weight control (66%) or fun and socialization (42%). After diagnosis, reasons identified as “other”, including pain management 30%, strength and flexibility maintenance 23%, maintaining mobility 11%, controlling fibromyalgia symptoms 8%, and to stay in shape 8%, were most commonly reported (see Table 4.4).
Table 4.3

*Exercise Behaviors* | Before Diagnosis | After Diagnosis
--- | --- | ---

<table>
<thead>
<tr>
<th>Elements</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>109</td>
<td>74.66</td>
<td>82</td>
<td>57.34</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>25.34</td>
<td>61</td>
<td>42.66</td>
</tr>
<tr>
<td>Exercise duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 Months</td>
<td>3</td>
<td>2.77</td>
<td>14</td>
<td>14.58</td>
</tr>
<tr>
<td>3-6 Months</td>
<td>5</td>
<td>4.63</td>
<td>8</td>
<td>8.33</td>
</tr>
<tr>
<td>6-9 Months</td>
<td>9</td>
<td>8.33</td>
<td>11</td>
<td>11.46</td>
</tr>
<tr>
<td>Over 9-Months</td>
<td>91</td>
<td>84.26</td>
<td>63</td>
<td>65.63</td>
</tr>
<tr>
<td>Exercise type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerobic</td>
<td>82</td>
<td>39.05</td>
<td>45</td>
<td>27.95</td>
</tr>
<tr>
<td>Stretching</td>
<td>74</td>
<td>35.24</td>
<td>80</td>
<td>49.70</td>
</tr>
<tr>
<td>Strength</td>
<td>54</td>
<td>25.71</td>
<td>36</td>
<td>22.36</td>
</tr>
<tr>
<td>Exercise location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic</td>
<td>3</td>
<td>1.60</td>
<td>9</td>
<td>5.96</td>
</tr>
<tr>
<td>Gym</td>
<td>51</td>
<td>27.13</td>
<td>30</td>
<td>19.87</td>
</tr>
<tr>
<td>Home</td>
<td>73</td>
<td>38.83</td>
<td>67</td>
<td>44.37</td>
</tr>
<tr>
<td>Park</td>
<td>27</td>
<td>14.36</td>
<td>20</td>
<td>13.25</td>
</tr>
<tr>
<td>Other</td>
<td>34</td>
<td>18.10</td>
<td>25</td>
<td>16.56</td>
</tr>
</tbody>
</table>
Table 4.4

<table>
<thead>
<tr>
<th>Reasons for exercising</th>
<th>Before Diagnosis</th>
<th>After Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Disease Prevention</td>
<td>20</td>
<td>11.17</td>
</tr>
<tr>
<td>Fun/socialization</td>
<td>45</td>
<td>25.14</td>
</tr>
<tr>
<td>Weight Control</td>
<td>71</td>
<td>39.66</td>
</tr>
<tr>
<td>Other</td>
<td>43</td>
<td>24.02</td>
</tr>
<tr>
<td>Strength/flexibility</td>
<td>2</td>
<td>6.06</td>
</tr>
<tr>
<td>Pain management</td>
<td>3</td>
<td>9.09</td>
</tr>
<tr>
<td>Mobility</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Symptom control</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stay in shape</td>
<td>8</td>
<td>24.24</td>
</tr>
<tr>
<td>Decrease stress</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Feel better/overall health</td>
<td>10</td>
<td>30.30</td>
</tr>
<tr>
<td>Increase endorphins/serotonin</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Enjoy outdoors</td>
<td>1</td>
<td>3.03</td>
</tr>
<tr>
<td>Exercise feels good</td>
<td>3</td>
<td>9.09</td>
</tr>
<tr>
<td>Maintain body alignment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Job</td>
<td>3</td>
<td>9.09</td>
</tr>
<tr>
<td>Method of transportation</td>
<td>1</td>
<td>3.03</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>3.03</td>
</tr>
<tr>
<td>Army training</td>
<td>1</td>
<td>3.03</td>
</tr>
</tbody>
</table>
Research Questions 2 and 3:

- Are physicians recommending exercise to FMS patients?
- What factors limit exercise behavior before and after diagnosis with FMS?

**Factors Impacting Exercise**

Physician recommendations for exercise prior to diagnosis were 65%, with a post-diagnosis recommendation rate of 88%. This shows that physicians are making more exercise recommendations to those with fibromyalgia. Factors reported as limiting exercise behavior before diagnosis included tired 61%, pain 54%, and increase in symptoms 46%. Although the responses did not change for exercise limiting factors, the rates increased substantially after diagnosis for tired 87%, pain 75%, and increase in symptoms 66% (see Table 4.5).
Table 4.5

<table>
<thead>
<tr>
<th>Factors Impacting Exercise</th>
<th>Before Diagnosis</th>
<th>After Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Physician recommendation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93</td>
<td>64.58</td>
</tr>
<tr>
<td>No</td>
<td>51</td>
<td>35.42</td>
</tr>
<tr>
<td>Limiting Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Time</td>
<td>50</td>
<td>14.97</td>
</tr>
<tr>
<td>Tired</td>
<td>89</td>
<td>26.65</td>
</tr>
<tr>
<td>Pain</td>
<td>78</td>
<td>23.35</td>
</tr>
<tr>
<td>Increase in Symptoms</td>
<td>69</td>
<td>20.66</td>
</tr>
<tr>
<td>Children</td>
<td>26</td>
<td>7.78</td>
</tr>
<tr>
<td>Just Don’t Want To</td>
<td>22</td>
<td>6.59</td>
</tr>
</tbody>
</table>
Research Question 4: What factors impact exercise self-efficacy for fibromyalgia support group members?

*Exercise Self-efficacy*

Each of the Likert Scale exercise self-efficacy questions showed statistical significance after evaluation with a chi-square ($p < .01$). The 15 questions evaluating exercise self-efficacy were combined into a single overall self-efficacy score ranging from a perfect score of 15 to a maximum score of 75 ($M= 42.51$, $S.D.= 10.74$, range 15-67) (see Table 4.6). Questions 19 through 36, excluding questions 26 and 35, were used to tabulate overall self-efficacy scores. In this case, a high exercise self-efficacy score indicated a low level of exercise self-efficacy.

Exercise self-efficacy question scores reported that knowledge performing aerobic ($M= 2.265$), flexibility ($M= 2.338$) and strengthening ($M= 2.411$) exercises received the best exercise self-efficacy scores (see Table 4.7). While being out of shape ($M= 3.465$), fear of pain ($M= 3.436$), and confidence performing flexibility exercises ($M= 3.418$) received the worst exercise self-efficacy scores.
Table 4.6

*Exercise Self-Efficacy Score*

<table>
<thead>
<tr>
<th>Type</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-exercising Score</td>
<td>47.02</td>
<td>8.51</td>
</tr>
<tr>
<td>Exercising Score</td>
<td>39.00</td>
<td>10.84</td>
</tr>
</tbody>
</table>

Range of score (15-67)
Table 4.7

*Exercise Self-efficacy Question Scores*

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t know how to perform aerobic exercises</td>
<td>2.265</td>
<td>1.278</td>
</tr>
<tr>
<td>I don’t know how to perform flexibility exercises</td>
<td>2.338</td>
<td>1.302</td>
</tr>
<tr>
<td>I do not want to be around others</td>
<td>2.411</td>
<td>1.271</td>
</tr>
<tr>
<td>I am afraid I will look silly exercising</td>
<td>2.418</td>
<td>1.326</td>
</tr>
<tr>
<td>I don’t know how to perform strengthening exercises</td>
<td>2.433</td>
<td>1.309</td>
</tr>
<tr>
<td>I am self-conscious about exercising in front of others</td>
<td>2.688</td>
<td>1.369</td>
</tr>
<tr>
<td>I let the weather stop me from exercising</td>
<td>2.842</td>
<td>1.258</td>
</tr>
<tr>
<td>I feel confident performing strengthening exercises</td>
<td>2.914</td>
<td>1.282</td>
</tr>
<tr>
<td>I feel confident performing aerobic exercises</td>
<td>2.914</td>
<td>1.344</td>
</tr>
<tr>
<td>I am afraid I will hurt myself if I exercise</td>
<td>3.000</td>
<td>1.294</td>
</tr>
<tr>
<td>I just don’t feel like exercising</td>
<td>3.078</td>
<td>1.293</td>
</tr>
<tr>
<td>I am afraid exercise will worsen my existing pain</td>
<td>3.305</td>
<td>1.251</td>
</tr>
<tr>
<td>I feel confident performing flexibility exercises</td>
<td>3.418</td>
<td>1.310</td>
</tr>
<tr>
<td>I am afraid I will experience pain if I exercise</td>
<td>3.436</td>
<td>1.334</td>
</tr>
<tr>
<td>I am out of shape</td>
<td>3.465</td>
<td>1.361</td>
</tr>
</tbody>
</table>

Note. Lower scores indicate higher levels of exercise self-efficacy
Hypotheses

Null hypothesis 1: There will be no difference in exercise self-efficacy between FMS support group members who currently exercise and those who do not.

An independent-samples $t$ test was calculated to determine if there was a difference among exercise self-efficacy and exercise behaviors. Whether the participant was exercising now (yes, no) was the independent variable, and overall exercise self-efficacy was the dependent variable ($t(133) = 4.671, p < .0001$). Participants who were not exercising post-diagnosis reported lower exercise self-efficacy levels ($M= 47.02, SD= 8.51$) than those who did exercise ($M= 39.00, SD= 10.84$) (see Table 4.8). As a result, this study rejected the null hypothesis.

Null hypothesis 2: There will not be a relationship between exercise participation before diagnosis and exercise participation after diagnosis among participants diagnosed with fibromyalgia.

To evaluate the relationship between exercise participation before and after diagnosis, a Chi-square analysis for exercise before (yes, no) and exercise after (yes, no) was conducted. Exercise participation before and after diagnosis were found to be independent ($\chi^2(1)= 2.02, p=.16$) (See Table 4.9). This study failed to reject the null hypothesis. As a result, it was concluded that exercise behavior before diagnosis does not impact exercise behavior after diagnosis. However, almost half of those who did not exercise before diagnosis, did begin to exercise after diagnosis (see Table 4.9).
Table 4.8

*Exercise Self-efficacy and Exercise Behavior*

<table>
<thead>
<tr>
<th>Exercise after diagnosis</th>
<th>N</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>76</td>
<td>56.30</td>
<td>39.00</td>
<td>10.842</td>
</tr>
<tr>
<td>No</td>
<td>59</td>
<td>43.70</td>
<td>47.017</td>
<td>8.507</td>
</tr>
</tbody>
</table>

Range of score (15-67)

Note. Lower scores indicate higher levels of exercise self-efficacy
### Table 4.9

**Exercise Behavior**

<table>
<thead>
<tr>
<th>Before and after diagnosis</th>
<th>Yes-after</th>
<th>No-after</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes-before</td>
<td>65</td>
<td>42</td>
<td>107</td>
</tr>
<tr>
<td>No-before</td>
<td>17</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>Totals</td>
<td>82</td>
<td>61</td>
<td>143</td>
</tr>
</tbody>
</table>
Discussion

A total of 2479 surveys regarding exercise self-efficacy and exercise behaviors were administered to fibromyalgia support group members, with a return rate of 7.7% (n=191). Over 90% of the respondents were Caucasian females, 62% of whom had been support group members for a year or longer. The mean age was 53 years, with the mean length of diagnosis of 8.04 years.

While not significant, there was a trend towards attrition; 75% of the participants had exercised before diagnosis, while only 57% were doing so after diagnosis. The majority (66%) of those who report exercise behaviors since diagnosis, have done so for a duration of 9-months or longer. Flexibility, aerobic, and strengthening exercises are performed, in that sequence, among those exercising after diagnosis. Before diagnosis, exercise was performed primarily for weight control or fun and socialization, with a shift toward pain and fibromyalgia symptom management and maintenance of strength, flexibility, and general mobility after diagnosis.

Physician recommendations for exercise increase after diagnosis (from 65% to 88%). Fatigue, pain and fear of increasing symptoms are the most frequently reported factors that negatively impact exercise behavior. The reported rates increased substantially after individuals’ fibromyalgia diagnosis.

Overall exercise self-efficacy scores (M= 42.51, S.D.= 10.74, range 15-67), indicate that participants in this study had a mean exercise self-efficacy sore in the 57% percentile of possible scores. Knowledge performing exercises received the best exercise self-efficacy question scores, while being out of shape, fear of pain, and confidence performing flexibility exercises, indicated the lowest exercise self-efficacy levels.
An independent-samples t-test was calculated to determine if there was a difference between exercise self-efficacy and exercise behaviors. Participants who were not exercising post-diagnosis reported lower exercise self-efficacy levels than those who did exercise, showing a significant relationship among exercise behavior and exercise self-efficacy.

A Chi-square analysis was used to evaluate the relationship between exercise participation before and after diagnosis. Exercise participation before and after diagnosis was found to be independent. It was concluded that exercise behavior before diagnosis does not significantly impact exercise behavior after diagnosis.
Chapter 5

Conclusion and Recommendations

Fibromyalgia is a growing condition with growing concerns. Financial or economic problems, inability to work, lower performance and productivity, frequent absences from work, challenged daily life activities, and compromised social interactions are only a few of the aspects of an individual’s life that may be affected. Macfarlane et al. (2001) wrote that widespread pain symptoms were markers for poor health with other possible complications, and that widespread pain alone could be associated with increased mortality, consistent with the non-disease death rates that were three to five times higher in participants with regional and widespread pain.

Today, educational programs and exercise are combined with medication for comprehensive treatment (VanWest & Maes, 2001). Learning to cope with the pain of fibromyalgia, rather than to fear it, is an area of focus. Additionally, psychological support, and increasing self-efficacy are of great benefit when implementing treatments. Exercise as a treatment of fibromyalgia is proving to be very effective. Thurston (1999) reminds people that, “the primary goal of the treatment program for (fibromyalgia) is to give the control of the patient’s life back to the patient” (¶18). The need for further research and a consistent diagnostic tool is evident if the treatment of fibromyalgia is to be effective.

The purpose of this study was to determine if there is a difference in self-efficacy between exercisers and non-exercisers, and to examine how the exercise behavior of FMS support group members has changed since their diagnosis with FMS.
Of interest was discovering what factors impacted exercise self-efficacy, and if physicians are recommending exercise for fibromyalgia support group members. Additionally, what factors limit exercise behavior before and after diagnosis with FMS, as well as how exercise behaviors of fibromyalgia support group members who exercised prior to diagnosis with fibromyalgia have changed since their diagnosis with fibromyalgia was of interest.

Conclusions

There was a significant difference in exercise self-efficacy and exercise participation level. Participants who exercised post-diagnosis reported lower exercise self-efficacy scores than those who did not exercise, showing an inverse relationship in score and level of exercise self-efficacy. Self-efficacy impacting factors include: confidence in performing the exercise, knowledge of how to perform the exercise, fears regarding exercise, external influencing factors such as the weather, and an individual’s social outlook. These results are well supported in available literature, and would likely be the outcome of future studies.

The results regarding exercise behavior before and after diagnosis indicate that fewer individuals (n=82) are exercising after their diagnosis with fibromyalgia. While the data was not significant, there was an obvious trend towards exercise attrition after diagnosis, reinforcing the need to address this population. However, the majority (66%) of those who have continued to exercise, have done so for a duration of 9-months or longer. These declining results were not surprising, as many individuals who are diagnosed with any condition that adversely affects their body, would experience some deviation from normal physical activity.
Discussion

The demographic characteristics of participants in this study are consistent with Meisler (2000) and Siegel et al. (1998). In this study, 95% of the sample were female. Although only a small portion of the participants completed and returned the survey, the trend is definitely toward middle-aged (M= 53), Caucasian (93%) females. Meisler identified that the length of time from onset of symptoms to diagnosis had dropped from nine, to 1-3 years. For this study, average length of time from first symptoms to diagnosis was less than three years.

Of the participants, 75% reported exercise behaviors prior to diagnosis, which included: 76% aerobic, 69% flexibility, and 50% strengthening. After diagnosis, the exercise percentage dropped to 57%, including: 85% flexibility, 47% aerobic, and 38% strengthening. The move away from aerobic and strengthening exercises supports Oliver and Cronan’s (2002) and Offenbächer and Stucki’s (2000) findings in regards to the tendency to gain weight and become de-conditioned after diagnosis. Aerobic and strengthening exercises are crucial for weight maintenance. Flexibility exercises alone will not increase the heart rate or build the lean muscle mass necessary for weight control. Gowans et al. (1999), Bailey et al. (1999), Meisler (2000), Da Costa et al. (2001), and Oliver and Cronan (2002), Richards and Scott (2002) all recognize the effects of exercise on women with fibromyalgia.

Offenbächer and Stucki (2000) revealed results of 95 patients, of which, “83% were not engaging in regular exercise, 65% had below average aerobic fitness, 51% perceived themselves to be working at the expected intensity, 29% were unable to reach aerobic threshold but perceived themselves to be working at a higher than expected
intensity” (p.78). Oliver and Cronan (2002) agree that, “exercise is important in the management of fibromyalgia syndrome” (p.383). Without exercise, a negative feedback cycle may develop. Individuals become de-conditioned and gain weight. The increased weight adds to the existing difficulty and pain with activity, leading individuals to avoid such activities. They become more de-conditioned as a result, and the cycle continues.

Before diagnosis, exercising was most frequently done at home (68%) or at the gym (47%) and for the reasons of weight control 66% or for fun/socialization 42%. After diagnosis, exercise behaviors at home did not change (68%), but fewer chose to go to the gym (31%). The reasons for exercising after diagnosis did shift significantly to include: “other” 63%, weight control 57%, and disease prevention 41%. Commonly mentioned “other” responses were pain management, to maintain strength and flexibility, and to assist with mobility. These responses demonstrate an increased awareness of the negative feedback cycle previously mentioned.

Factors limiting exercise behavior before diagnosis included: tired 61%, pain 54%, increase in symptoms 46%; after diagnosis: tired 87%, pain 75%, and increase in symptoms 66%. These excuses are consistent with those found by Leville et al. (2003), Ostir et al. (2003), and Tucker & Reicks (2002): pain, chronic disease, functional or physical limitations, poor subjective health, perceptions about health behavior, and others. Fortunately, a positive feedback cycle has an opportunity to exist. In this scenario, exercise initially increases fatigue. This contributes to an increased amount of sleep, during which the body is able to heal and rejuvenate (Krsnich-Shriwise, 1997; Siegel et al., 1998; Thurston, 1999; Meisler, 2000; NFA, 2005). The result is less pain and a
decrease in symptoms and fatigue (Gowans et al., 1999; Da Costa, Dobkin, Dritsa & Fitzcharles, 2001). Continuation of exercise encourages this cycle to continue.

The research demonstrates that one of the most effective treatments for a majority of fibromyalgia patients is exercise therapy. Offenbächer and Stucki (2000), as well as Forseth and Gran (2002), recommend establishing realistic expectations with patients before beginning an exercise program. However, if exercise programs do not consist of a balance of strength, aerobic and flexibility training, they may not be as effective.

Many exercise programs are offered in clinical rehabilitation settings where exercise equipment and trained professionals are readily available (Côté, 1999). However, this study found that participants are not going to organized exercise classes. 68% exercised at home, with about one third going to the gym. Richards and Scott (2002) pointed out that in public exercise settings, instructors may lack training with disabled populations, putting those trying to exercise at risk. As a result, home exercise programs have been recommended by Thurston (1999), and should be, as they offer the greatest potential for exercise.

An important factor discussed by Thurston (1999) and Offenbächer and Stucki (2000) was the impact of Delayed Onset Muscle Soreness (DOMS) on exercise programs. Postural, stretching, low weight, low repetition strength training, and cardiovascular components are crucial, but must be performed properly in order to reduce the effects of DOMS (Côté, 1999; Gowans et al., 1999; Thurston; Richards & Scott, 2002).

Self-efficacy is not only correlated to, but is predictive of exercise behavior (Sullum & Clark, 2000; Leveille et al., 2003; Bandura, 1997). Active individuals tend to
have higher exercise self-efficacy before and after diagnosis (Yin & Boyd, 2000). Ostir et al. (2003) suggested a relationship among increased age, lower educational level and lower exercise self-efficacy.

Prohaska and Glasser (1994), Bandura (1997), Jenkins and Gortner (1998), Resnick et al. (2000), and Wise and Trunnell (2001) noted that older populations had lower self-efficacy. Additionally, females had lower self-efficacy and higher outcome expectations (Grembowski et al., 1993). Every participant in this study demonstrated a high school education, with 77% reporting some level of college education. Of the participants, 30%, had achieved an undergraduate degree, followed at 19% by postgraduate education (n=137). Age ranged from 21 to 84 years, with a mean of 53 years, again, consistent with previous research.

Self-efficacy and exercise experience appear to be predictors of continued exercise behaviors (Oliver & Cronan, 2002; Leville et al., 2003; Pinto et al, 2001). Exercise Self-efficacy was measured on a 5-point Likert Scale, which showed statistical significance after evaluation with a chi-square ($p< .01$). Exercise self-efficacy scores ranged from the best level of exercise self-efficacy possible (a perfect score of 15) to a very poor level of exercise self-efficacy (a score of 67), with a maximum score of 69.

Exercise self-efficacy question scores showed that there was high exercise self-efficacy regarding knowledge in performing exercises. This would be expected to contribute to a higher level of exercise participation. Grembowski et al. (1993), Bandura (1997), and Wise and Trunnell (2001) pointed out that a positive self-efficacy experience is critical to reinforce efficacy and that elevated self-efficacy and increases in exercise
behavior have been linked by Leville et al. (2003), Clark (1999), Jette et al, (1998), and McAuley et al. (2000).

Over the years, it has been shown that self-efficacy and exercise are strongly correlated (Katula & McAuley, 2001; Ostir et al., 2003; Duncan & McAuley, 1993; Sallis et al., 1989), and that elevated exercise self-efficacy, regular exercise, and decreased attrition are strongly correlated (Oliver & Cronan, 2002; Feltz, 1992; Tucker & Reicks, 2002; Treasure & Newberry, 1998). Exercise predictors include, “younger age, unemployment, and higher exercise self-efficacy” (Oliver & Cronan, 2002, p.385).

Other factors found to contribute to self-efficacy were the opportunity to socialize, as well as improvements in aerobic, flexibility, strength and balance training. These all have an impact on activity adoption and reduction of number and degree of tenderness at tender points, and an improved aerobic fitness levels (Treasure & Newberry, 1998; Resnick et al., 2000; Oliver & Cronan, 2002; and Tucker & Reicks, 2002).

Social aspects, exercise adoption behaviors and self-efficacy were noted to have increased with physician counseling and support (Meisler, 2000; Pinto et al., 2001; Cardol et al., 2002; Treasure& Newberry, 1998). Physician recommendations for exercise in this study before diagnosis were 65% (n=144), with post-diagnosis rate of 88% (n=142). Of the support group members that participated, 62% had been members for a minimum of 1-year (n=144), demonstrating high levels of support networks. Self-efficacy and exercise coincide and may be influenced by socially supportive group environments, including attention from instructors, general social interactions, as well as verbal
messages, and positive engagement (McAuley et al., 2000; Treasure and Newbery, 1998; Bandura, 1997).

A significant concern noted with exercise programs was poor adherence and retention rates identified by Oliver & Cronan (2002). However, exercise duration in this study showed 84% participating in exercise behavior for over 9-months (n=108) before diagnosis, with 66% exercising a duration of 9-months or longer (n=96) after their fibromyalgia diagnosis. While Sullum and Clark (2000), Da Costa et al. (2001) and Richards and Scott (2002) suggested that dropout rates exceed 50% within three to six months, Wise and Trunnell (2001) discovered that, “people with a strong sense of efficacy attempt new tasks, expend greater effort, and persevere longer than those who are not as efficacious” (p. 268). While not significant in this study, there was definitely a trend towards attrition; 75% of the participants had exercised before diagnosis, while only 57% were doing so after diagnosis.

Ostir et al. (2003), Resnick et al. (2000), and McAuley et al. (2000) suggest that improved exercise interventions may occur as a result of an improved understanding of the factors affecting exercise self-efficacy. Gowans et al. (1999), Pinto, Lynn, Marcus, DePue and Goldstein (2001), Da Costa et al. (2001) all support the need for increased activity if fibromyalgia treatments are to be effective.

__Recommendations for Practice__

Understanding what factors impact exercise self-efficacy may allow for more effective exercise program implementation. When working with a fibromyalgic, knowledge of their exercise behaviors prior to diagnosis may indicate their level of acceptance and adherence to an exercise regimen after diagnosis.
Unfortunately, these findings may continue as the predominant result in future studies of this type, until more effective means of exercise are implemented with disabled populations. Comprehension of the issues perceived to be barriers to initiation or continuation of exercise programs may allow the fibromyalgic and practitioner to work together more efficiently to effectively treat Fibromyalgia symptoms.

**Limitations**

Shortcomings of this study include numerous factors, primarily regarding the use of support groups. The response rate of fibromyalgia support group participant was very low, only 7.7%. Many of the support group listings on the databases were outdated; they either no longer met or contained incorrect contact information. Many of the support groups listed included online or telephone support groups. This study was limited to physical meetings. If individuals were not able to attend the support group meeting at which the survey was administered, they were not included in the study. Additionally, support group administrators requested numbers of surveys were not representative of those in attendance who took the surveys. This had a substantial impact on the return rate statistics as a result.

Another important issue was that support group meetings were very flexible. If the leader was not able to host the meeting (health, schedule conflict, weather), then it was simply cancelled. One group leader reported the cancellation of their meeting as a result of an imminent hurricane. Many surveys were not returned because the group was not able to meet during the study.

Administering this study during the summer may have also impacted the return rate. Many support group leaders included notes in the return packet apologizing for the
low response rates. Low attendance during summer meetings was common as a result of family activities and vacations occurring during June, July and August. Yet another consideration is that of exercising during these months. Weather conditions, especially heat, pose a great threat to the health of exercising individuals. Even elite athletes must postpone athletic activities at times. The impact of such conditions on older populations is also an area of great attention during the summer. Exercise behaviors may be adversely affected as a result.

Scheduling conflicts posed the greatest challenge, as many groups had a full calendar of events planned as far as a year in advance. The other common reason for declining participation in the study was that the topic of exercise conflicted with the support groups treatment protocol or recommendation. Although there is significant data supporting exercise as an effective treatment, many individuals do not support this concept.

In selecting support group participants for this sample, a great number of individuals with fibromyalgia were excluded from the study. Many of those individuals may have other support networks and choose not to attend support groups. Additionally, individual perceptions of support groups, whether positive or negative, may impact their decision to participate in such groups. Individuals with a strong exercise regimen may not feel a need to attend support groups.

The primary concern with the administration of the online format was the members’ use and knowledge of computers. The population sampled (mean age 53) may not be as familiar or comfortable with the use of computers. If this was in fact the case, a great deal of the sample never had the opportunity to take the survey.
Finally, incomplete surveys posed a problem. Commonly the backs of the page(s) were left blank, the participant could not recall dates, or they did not want to reveal their demographic information. This had a negative impact on the statistical data as a result.

**Recommendations for Future Studies**

There is a need for future research to focus on compliance, feasibility, long-term effects of physical activity, type of exercises, duration, and the amount of manpower required for the programs to be effective, supported by Richards and Scott (2002), Gowans et al. (1999), Da Costa et al. (2001), Thurston (1999), and Forseth and Gran (2002). For this study specifically, including online support groups in those recruited to participate in the online survey may improve the return rate. This population has already demonstrated a competence with computers; a perceived drawback with the use of the online format. Another possibility would be to offer the participant the option of selecting the hard copy or online survey format, again, helping to improve return rate.
References


Appendix A

Survey Instrument
1.) Have you been diagnosed with fibromyalgia by a physician?  Yes  No

2.) When did you first see a physician about your condition?  Month/Year:________

3.) When were you diagnosed with fibromyalgia?  Month/Year:________

4.) How long have you been a member of a fibromyalgia support group?  
   (#)_____  please circle one: Days / Weeks / Months / Years

The following questions 5-11, are **BEFORE** your diagnosis with fibromyalgia:

5.) Did you exercise before the onset of your fibromyalgia?  
   ___  Yes (please answer questions 6-10)  
   ___  No (please skip to question 10)

6.) Which of the following exercises did you do? (check all that apply)  
   ___  Stretching/ flexibility exercises  
   ___  Strength/ resistance exercises  
   ___  Aerobic/ cardiovascular exercises

7.) Where did you exercise? (check all that apply)  
   ___  clinic  
   ___  gym  
   ___  home  
   ___  park  
   ___  other (please specify) ________________________

8.) How long had you regularly exercised? (check only one)  
   ___  0-3 months  
   ___  3-6 months  
   ___  6-9 months  
   ___  over 9 months

9.) What were your reasons for exercising? (check all that apply)  
   ___  Disease prevention  
   ___  Weight Control  
   ___  Fun/ Socialization  
   ___  Other reasons: (please specify) _____________________________

10.) Had your doctor ever recommended exercise?  Yes  No

11.) What factors do you feel kept you from exercising? (check all that apply)  
   ___  lack of time  
   ___  tired  
   ___  pain  
   ___  increase in symptoms  
   ___  children  
   ___  just don’t want to
The following questions 12-16, are **AFTER** your diagnosis with fibromyalgia:

12.) Have you regularly exercised since your fibromyalgia diagnosis?
   ___ Yes (Please answer questions 13-17)
   ___ No (Please skip to question 17)

13. Which of the following exercises do you do? (check all that apply)
   ___ Stretching/ flexibility exercises
   ___ Strength/ resistance exercises
   ___ Aerobic/ cardiovascular exercises

14.) Where do you exercise? (check all that apply)
   ___ clinic
   ___ gym
   ___ home
   ___ park
   ___ other (please specify) ________________________

15.) How long have you regularly exercised? (check only one)
   ___ 0-3 months
   ___ 3-6 months
   ___ 6-9 months
   ___ over 9 months

16.) What are your reasons for exercising? (check all that apply)
   ___ Disease prevention
   ___ Weight Control
   ___ Fun/ Socialization
   ___ Other reasons: (please specify) ________________________

17.) Has your doctor ever recommended exercise?
   ___ Yes
   ___ No

18.) What factors do you feel keep you from exercising? (check all that apply)
   ___ lack of time
   ___ pain
   ___ children
   ___ tired
   ___ increase in symptoms
   ___ just don’t want to

For questions 19-33, please use the following scale:

Strongly Disagree=SD  Disagree=D  No Opinion=N  Agree=A  Strongly Agree=SA

**Please circle one choice:**

19.) I feel confident performing flexibility / stretching exercises?  SD / D / N / A / SA

20.) I feel confident performing resistance / strengthening exercises?  SD / D / N / A / SA
21.) I feel confident performing aerobic / cardiovascular exercises?  SD / D / N / A / SA
22.) I don’t know how to perform flexibility/ stretching exercises.  SD / D / N / A / SA
23.) I don’t know how to perform resistance/ strengthening exercises. SD / D / N / A / SA
24.) I don’t know how to perform aerobic/ cardiovascular exercises. SD / D / N / A / SA
25.) I am afraid I will experience pain if I exercise. SD / D / N / A / SA
26.) I do not have a training partner to exercise with SD / D / N / A / SA
27.) I am afraid exercise will worsen my existing pain.  SD / D / N / A / SA
28.) I am afraid I will hurt myself if I exercise. SD / D / N / A / SA
29.) I am self-conscious about exercising in front of others. SD / D / N / A / SA
30.) I am out of shape.         SD / D / N / A / SA
31.) I do not want to be around others.        SD / D / N / A / SA
32.) I am afraid I will look silly exercising. SD / D / N / A / SA
33.) I let the weather stop me from exercising. SD / D / N / A / SA
34.) I need someone to show me how to exercise. SD / D / N / A / SA
35.) I just don’t feel like exercising. SD / D / N / A / SA

Demographic Information
37.) Gender: (check one) ___Male ___Female
38.) Age: _____ years old
39.) Race: (check one)
___African American   ___Asian   ___Caucasian ___Native American
___Pacific Islander  ___Hispanic ___Other: ______________

40.) Highest level of education completed: (check one)
___ Less than High School
___ Completed High School
___ Some College
___ Undergraduate Degree
___ Post-graduate
Appendix B

IRB Approval Documents
Title of Study: Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey online. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

To receive a link to the survey via email, please write your name and your email address on the sign-up sheet provided by the support group facilitator. You will receive an email with a link to the survey within 2 weeks. Completing the survey will take less than 15 minutes. When you are finished, simply hit submit on the online survey form. Your name is not requested on the online survey so that the survey is completely anonymous.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.

PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.
University of Cincinnati
Information Sheet for a Research Study
College of Education, Criminal Justice, and Human Services
Arienne Davis
828-406-1248

Title of Study: Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

Completing the survey will take less than 15 minutes. When you are finished, please place it in the envelope at the front of the room. Do not write your name on the survey form.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.

PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.
Appendix C

Support Group Administrator Scripts
Support Group Administrator Instructions

- Please pass out only the Information Sheet (2 per participant)
- Please read the following with the participants:

**Title of Study:** Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey online. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

To receive a link to the survey via email, please write your name and your email address on the sign-up sheet provided by the support group facilitator. You will receive an email with a link to the survey within 2 weeks. Completing the survey will take less than 15 minutes. When you are finished, simply hit submit on the online survey form. Your name is not requested on the online survey so that the survey is completely anonymous.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.

PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.

- Please instruct the members to print very clearly on the second copy
- Please inform them to provide a mailing address, or note they would like them e-mailed, if they wish to receive a copy of the results of the study
- Please collect the sign-up sheets and return in the pre-paid envelope

*Thank you for your assistance.*
Support Group Administrator Instructions

- Please pass out only the Information Sheet (2 per participant)
- Please read the following with the participants:

**Title of Study:** Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

Completing the survey will take less than 15 minutes. When you are finished, please place it in the envelope at the front of the room. Do not write your name on the survey form.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

**BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.**

**PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.**

- Please pass out the survey
- Please instruct members to print their name with a mailing or e-mail address on the information sheet if they wish to receive a copy of the results of the study
- Please ask participants to place this copy of the information sheet in the envelope
- Please ask the participants to place their completed survey in the manila envelope
- Please ask the last person to place their survey in the manila envelope to seal the envelope and write the date across the seal
- Please return the pre-paid envelope

*Thank you for your assistance.*
Appendix D

Information Sheets
Title of Study: Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey online. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

To receive a link to the survey via email, please write your name and your email address on the sign-up sheet provided by the support group facilitator. You will receive an email with a link to the survey within 2 weeks. Completing the survey will take less than 15 minutes. When you are finished, simply hit submit on the online survey form. Your name is not requested on the online survey so that the survey is completely anonymous.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.

PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.

Name _______________________________ Date ___________

E-mail _______________________________

#06-05-01-15X Information Sheet – online (v.5-11-06) IRB approved 5-11-06
Title of Study: Relationships Among Exercise Self-Efficacy, Previous Exercise Experience and Exercise Behavior Among Fibromyalgia Support Group Members

I am inviting you to complete an anonymous survey. The survey is part of a research study that I am doing for my masters degree program. The questions ask about your exercise behaviors and attitudes prior to and following your diagnosis with fibromyalgia.

Completing the survey will take less than 15 minutes. When you are finished, please place it in the envelope at the front of the room. Do not write your name on the survey form.

There are no expected risks or benefits to you from completing the survey. Because the survey is anonymous, your identity and your answers cannot be connected. Your participation may, however, help educate other fibromyalgia patients about exercise. There are no other activities planned if you do not want to complete the survey.

If you have any questions about study-related activities, you may call me at 828-406-1248 or Dr. Amy Bernard, my faculty advisor, at 513-556-2126. If you have any questions about your rights as a research participant, you may call the Chair of the Institutional Review Board - Social and Behavioral Sciences at 513-558-5784.

You do NOT have to participate in this study. You may choose not to participate or you may quit participating AT ANY TIME.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH PROJECT.

PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.