

Complementary and Integrative Therapies for the Treatment of Fibromyalgia

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COMPLEMENTARY AND INTEGRATIVE THERAPIES FOR THE
TREATMENT OF FIBROMYALGIA

by

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A thesis submitted in partial fulfillment of the requirements

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Abstract

Fibromyalgia syndrome (FMS) is a debilitating and chronic condition with an array of symptoms, the most distinguishable being widespread pain. FMS patients experience a marked decrease in quality of life related to intensity of symptoms. Current treatment options and pharmaceuticals do not provide adequate relief. This thesis examines integrative and complementary therapy options for symptom management and improvement of quality of life for FMS patients. A literature review was conducted of English current research using multiple databases. Findings indicate mindful movement therapies (MMT) such as yoga and tai chi, mindfulness, sensory-related relaxation techniques with guided imagery, and cognitive behavioral therapy (CBT) provided some relief and increased in perceived quality of life (QoL).

DEDICATION

for my family,
for inspiring and supporting me,
and helping me do more than I ever dreamed

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TABLE OF CONTENTS

Introduction.....	1
Problem.....	2
Purpose.....	3
Background.....	4
Method.....	7
Findings.....	9
Demographics.....	9
Mindful Movement Therapies.....	9
Mindfulness Meditation.....	14
Guided Imagery.....	16
Cognitive Behavioral Therapy.....	17
Mindful Movement Therapies.....	19
Mindfulness Meditation.....	20
Guided Imagery.....	21
Cognitive Behavioral Therapy.....	22
Limitations.....	24
Nursing Research.....	25
Education.....	26

Nursing Practice 26

Conclusion 28

APPENDIX A: SELECTION METHOD OF LITERATURE 29

 Figure 1: Selection Method of Literature..... 30

APPENDIX B: TABLES OF EVIDENCE 31

References 41

LIST OF TABLES

Table 1: Individuals with clinically meaningful improvements	13
Table 2: Percentage of clinically significant difference in pain intensity and FIQ score	18

Introduction

Fibromyalgia Syndrome (FMS) is a chronic condition characterized by widespread pain and a multitude of other physical and psychological symptoms. Currently, long-term treatment options for FMS are limited. Patients who suffer from FMS live with chronic widespread debilitating pain that causes a marked negative impact on their quality of life. For some, FMS can make everyday activities such as work, socializing, and self-care intolerable. Choy et al. (2010) survey of 800 patients showed that over half rated symptoms of FMS as very or extremely disruptive to their quality of life (p. 2). Seventy percent of participants rated pain levels in the seven to ten range with ten being the worst (p. 3). Walitt, Nahin, Katz, Bergman, and Wolfe (2015) reported “55.8 percent of persons with fibromyalgia under 65 years of age reported they were unable to work now because of health” (p. 6), and “30.2 percent of patients with FMS had received disability payments within the year” (p.7).

Like other patients suffering from chronic pain, a sizable portion of FMS patients show interest or have tried complementary and integrative therapies. A study conducted by the Mayo Clinic of 289 participants with FMS reported significant utilization of complementary therapies by patients, with an average of three different therapy modalities (Wahner-Roedler et al., 2005). Among those surveyed, the most utilized therapies were those related to exercise and spiritual healing (Wahner-Roedler et al., 2005). There is a scarcity of current information on complementary and integrative therapy used by fibromyalgia patients.

The practice of mindfulness, also referred to as meditation, has shown positive implications in symptom management for FMS. Mindfulness is defined as purposeful attention to

self-awareness and to the present without judgement (Kabat-Zinn, 1994). Mindfulness was first introduced as a medical application in 1979 by Kabat-Zinn, but draws principles and practices from Buddhism (Williams, & Kabat-Zinn, 2013, p.19). A national survey conducted by Clarke, Black, Stussman, Barnes, and Nahin (2015) showed meditation was used by almost 18,000 adults in the year 2012 in the United States (p.10). Current medical uses for mindfulness meditation include pain management, hypertension, anxiety, depression, insomnia, irritable bowel syndrome and ulcerative colitis (National Center for Complementary and Integrative Health, 2016).

Studies comparing pharmaceutical therapy to interdisciplinary treatment encompassing psychological, medical, education, and physiotherapeutic interventions have shown positive effects on quality of life for FMS patients (Martín et al., 2014). Meditative movement therapy (MMT) such as yoga and tai chi may provide psychological and physiotherapeutic interventions appropriate for treatment. MMT is defined as, “movement or body positioning, focus on breathing, cleared and calm state of mind with a goal, and a deep status of relaxation” (Langhorst, Klose, Dobos, Bernardy, & Hauser, 2012, p.193). Other complementary and integrative therapies such as guided imagery (GI) and Cognitive Behavioral Therapy (CBT) have qualities that could positively impact FMS patients. Integration of these therapies into a patient’s treatment may provide some symptom relief and improve their quality of life.

Problem

The current medical treatment recommendations for fibromyalgia may not provide adequate pain and symptom management. This is evident by high patient dissatisfaction rates related to treatment, with 28 percent being “not very satisfied or not at all satisfied” (Choy et al., 2010, p.6). Diminished quality of life necessitates treatment options that can bring relief of

symptom severity. Health related quality of life (HRQOL) is defined as, “a multi-dimensional concept that includes domains related to physical, mental, emotional, and social functioning” (Office of Disease Prevention and Health Promotion, n.d.). Pharmacological interventions alone do not provide adequate symptom relief for FMS. Complementary and integrative therapies may be effective for symptom management and FMS QoL issues but needs further investigation. Research focused on of mindful movement therapies (MMT) and complementary therapies for fibromyalgia patients could lead to a greater understanding of pain and symptom management with an increase in quality of life.

Nurses and other health care providers (HCP) provide information and advocacy for patients. They play a pivotal role in patient education and recommendations of resources. Discrepancies and inconsistencies exist in current treatment guidelines, is evidenced by the multitude of guidelines provided by various pain societies such as the American Pain Society and Canadian Pain Society (Thieme, Mathys, & Turk, 2017). Because FMS is a multi-faceted spectrum of symptoms that impacts patients in varying degrees, it is difficult to specify one standard treatment plan for the FMS cohort. To provide patients with evidence-based individualized therapies and possible treatment modalities, nurses and HCPs need additional education and understanding of complementary and integrative therapies identified as effective for the treatment of FMS.

Purpose

This study’s purpose is to review the current literature to (1) identify complementary and integrative treatment interventions for FMS that address pain and symptom severity, (2) identify

quality of life outcomes for FMS patients, and (3) provide insight into best practices for nurses and HCPs on treatment options, recommendations, and education for FMS patients.

Background

FMS is a chronic disorder characterized by a multitude of symptoms, the most prominent being widespread pain. Also, the condition has an association with several comorbidities. These include but are not limited to fatigue, sleep disorders, headaches and irritable bowel syndrome (Barbour, 2000). Symptoms of FMS are not limited to physical manifestations. Patients may also present with cognitive disturbances, such as problems with memory, confusion, anxiety, and depression (Menzies, 2016). Additionally, there is a marked decline in patient's general aerobic fitness. Studies show an average 40-year-old fibromyalgia patient's fitness level is equivalent to that of a typical 70 to 80-year-old (Mist, Firestone, & Jones, 2013).

Fibromyalgia is estimated to affect up to four million adults in the United States (CDC, 2017). FMS affects all age groups, ethnicities, and genders. Although FMS is not limited to a specific cohort, it is more prevalent in women 40 to 49 years of age, who are ten times more likely to develop FMS (Korhan, Uyar, Eyigör, Yönt, & Khorshid, 2016; Martin et al, 2014).

Currently, there is no known etiology or lab test used to confirm a diagnosis of FMS. It is hypothesized to be a dysfunction in sensory and pain processing with over stimulation by environmental factors and a decrease in pain threshold. Associated risk factors include family history of FMS; neurochemical imbalances; physical and emotional trauma; and disease processes such as Lyme disease and hepatitis (Menzies, 2016). Arnold et al. (2013) analyzed the genotypes of 116 families with Fibromyalgia and established a risk ratio of 13.6 for siblings to develop FMS (p. 1126). This study suggests a strong etiologic genetic connection.

Because there are no definitive biomarkers or lab tests to diagnose FMS; diagnosis is primarily dependent on subjective criteria. The current diagnostic criteria for FMS as revised in 2016:

(1) Generalized pain, defined as pain in at least 4 of 5 regions, is present, (2) Symptoms have been present at a similar level for at least 3 months, (3) Widespread pain index (WPI) greater than or equal to 7 and symptom severity scale (SSS) score greater than or equal to 5, or WPI of 4-6 and SSS score of at least 9, (4) diagnoses does not exclude the presence of other clinically important illnesses (Wolfe et al., 2016, p.326).

The WPI is a tool utilized by HCPs for patients to identify pain in several specific locations which include the shoulders, jaw, legs, abdomen, and neck (Hauser & Wolfe, 2012). The SSS provides a quantifiable measure on a scale from 0-3 addressing common symptoms for FMS: fatigue, waking unrefreshed, and cognitive symptoms (Hauser & Wolfe, 2012).

Differential diagnosis is necessary due to a wide array of presentations. FMS can often be mistaken for other conditions with similar presentations such as hypothyroidism and other inflammatory rheumatic disorders (Arnold, Clauw, & McCarberg, 2011). These conditions are not mutually exclusive. A diagnosis of FMS can be made, and comorbidities should be managed accordingly. Laboratory testing is generally limited to routine testing of complete blood count (CBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), metabolic panel, and thyroid function test (Arnold et al., 2011). Emphasis should be placed on a thorough health history and physical by the HCP.

Current medical treatment recommendations are directed toward the management and relief of pain through the incorporation of non-pharmaceutical and pharmaceutical therapies, with an emphasis on patient education and self-care (Menziés, 2016). There is no medical algorithm for treatment. A survey of 91 physicians supported the inclusion of interdisciplinary therapies in conjunction with pharmaceuticals for their FMS patients (Able et al., 2016). Of those surveyed, “the most common non-pharmacologic treatments for fibromyalgia were rest (91.0%) and exercise (89.5%), followed by heat modalities (75.5%) and prayer, relaxation, or meditation (75.2%)” (Able et al., 2016). Because FMS presents as a multitude of symptoms, it is necessary for HCP’s to collaborate with their patients, as well as stress the importance of patient self-management and adherence to treatment plans (Arnold, Clauw, Dunegan, & Turk, 2012).

Medications currently approved by the Food and Drug Administration (FDA) for FMS include pregabalin (Lyrica), duloxetine hydrochloride (Cymbalta), and milnacipran hydrochloride (Savella) (U.S. Food and Drug Administration, 2014). Choy et al. (2010) survey reported that, “70% (of patients) were using pain medications prescribed by the physician, 36% were using over the counter analgesics, 28% were using sleep aids and 56% were using other prescribed agents” (p.5). High prevalence of medication prescriptions could be related to physician preferences. Able et al. (2016) physician survey reported more confidence in prescribing pharmaceutical therapies. Present pharmaceutical therapies offer patients some relief, demonstrating 30% pain improvement and 20% functional improvement. The efficacy of these drugs is insufficient for a majority of the FMS population (Mist, Firestone, & Jones, 2013). Many of these patients have turned to self-management, incorporating complementary and integrative therapies into their treatment. Among the patients participating in the Mayo Clinic’s

fibromyalgia treatment program, 50 percent had confirmed the current or prior use of CAM in some form (WahnerRoedler et al., 2005).

Exercise is currently recommended as part of FMS treatment plans. Although there have been positive correlations with exercise and FMS, studies focusing on traditional exercise methods show a high attrition rate of 67% (Mist et al., 2013). This level of attrition could be related to an inappropriate selection of exercise interventions due to a multitude of factors such as high intensity and frequency. MMT, such as yoga, tai chi, and qigong, have been used for wellness and health for centuries in ancient and modern cultures. These modalities incorporate physical movement with a meditative focus on breathing and relaxation. Research of the efficacy of MMT for FMS is limited. MMT's effectiveness in pain management indicates possible positive outcomes which may support use in FMS treatment. MMT could provide an exercise option that is low-impact, low intensity, patient-centered and subsequently reduce FIQ, WPI and SS values, thus increasing patient quality of life.

Method

A search of the literature was completed to identify current original research investigating complementary and integrative therapies for symptom management of fibromyalgia. Articles from the years 2012 to 2017 were included in this search. Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medical Literature On-line (MEDLINE), PsychINFO, Cochrane Central Register of Controlled trials, and Cochran Database of Systemic reviews were utilized. Inclusion criteria are Fibromyalgia AND alternative therapies, or integrative, or integrative therap*, or complementary therap*, or complementary medicine, or medicine Chinese Traditional,

AND adult#. Exclusion criteria included NOT adolescent* or juvenil* or teen* or youth or child*.

Language was limited to English.

Findings

A total of nine studies were included in this literature review (Table 1). These include original research addressing complementary and integrative therapies and effects on fibromyalgia symptoms and or patient quality of life. Studies were published within the past five years (2012 – 2017), except for one from 2010 with a follow up study published in 2012. Seven of the studies were randomized control trials (RCT) (Bongi et al., 2016; Carson et al., 2010; Carson, J., Carson, K., Jones, Mist, & Bennett, 2012; Cash, Salmon, Weissbecker, & Sephton, 2014; Castel, Cascon, Padrol, Sala, & Rull, 2012; Lynch, Sawynok, Kiew, & Marcon, 2012; Van Gordan, Shonin, Dunn, Garcia-Campayo, & Griffiths, 2016). One study utilized a cross-sectional survey (Jones, Mist, Casselberry, Ali, & Christopher, 2015), and one was a two-group quasi-experimental study (Onieva-Zafra, Hernandez Garcia, & Gonzalez del Valle, 2015). There was one sequential trial and three-month follow-up (Carson et al., 2012).

Demographics

The sample sizes ranged from 20 to 4,986 participants. Participants are adults with the minimum age requirement in all studies from 18 to 21. There was a greater female to male ratio of participants in all studies. All studies included required American College of Rheumatology diagnostic criteria, or confirmation of a current FM diagnosis from a physician. One study utilized self-reported HCP diagnosis of FMS (Jones et al. 2015).

Mindful Movement Therapies

Bongi et al. (2016), conducted a sixteen-week RCT evaluating the efficacy of Tai Chi on quality of life, disability, pain, tenderness, psychological distress and sleep quality in 44 FMS

patients. Twenty-two participants were instructed to practice for thirty minutes at home daily accompanied by an instructional DVD. Twenty-two participants remained in the control group and received education about FMS twice a week. Outcomes were measured with the Fibromyalgia Impact Questionnaire (FIQ), Short Form 36 (SF-36), health assessment questionnaire (HAQ), functional assessment of chronic illness-fatigue (FACIT-fatigue), Pittsburgh sleep quality index (PSQI), hospital anxiety and depression scale (HADS), widespread pain index (WPI), and tender points evaluation (TPE).

Results indicated significant improvements in, “health-related quality of life, fatigue and disability, referred pain and induced tenderness... sleep quality and anxiety” (Bongi et al., 2016). This was evident by a ten-point reduction in FIQ scores ($p < .05$) and decreased FACIT-fatigue, TPE ($p < .001$) and WPI scores ($p < .01$). There were increased SF-36 scores in bodily pain ($p < .001$), physical function physical role, general health, vitality, and emotional role ($p < .01$ for all), and significant improvement in sleep (PSQI $p < 0.5$). No significance was found in the HAQ or depression scale of HADS. Limitations of a small sample size and no follow-up data collection were identified. Tai Chi has many styles, consequently it is difficult to standardize and evaluate against other studies.

In an eight-week pilot RCT, Carson et al. (2010) hypothesized yoga practice would generate significant reduction in FMS symptoms and functional deficits, as well as increase pain coping strategies. There were fifty-three all-female participants, twenty-five were placed in the yoga practicing group, the remainder continued with standard care. Yoga, specifically Yoga of Awareness, was practiced once a week for 120 minutes with a certified instructor with standardized guidelines created by the researchers (Carson et al., 2010, p. 3-4). Participants were

instructed to complete 20-40 minutes of practice every day at home accompanied by an instructional DVD. Outcomes were measured with the Fibromyalgia Impact Questionnaire Revised (FIQR), Patient Global Impression of Change (PGIC), Total Myalgic Score (TMS), timed chair rise, Sensory Integration for Balance Test (SCBT), Chronic Pain Acceptance Questionnaire (CPAQ), Coping Strategies Questionnaire (CSQ), Vanderbilt Multidimensional Pain Coping Inventory (VMPCI), and daily diaries rating pain, fatigue, distress, vigor, acceptance and relaxation.

Results indicated FIQR scores were reduced by 31.4%, which is double the standard 14% for clinical significance criteria (Carson et al., 2010). Improvements were also shown in the PGIC ($p < .0001$) and timed chair rise ($p < .05$), but the TMS, assessing tender points, did not improve ($p = .62$) (Carson et al., p.9). Pain catastrophizing ($p < .05$) and VMPCI scores in the subscales of problem solving ($p < .05$), positive reappraisal ($p < .05$), use of religion ($p < .05$), self-isolation ($p < .01$), and disengagement ($p < .01$) also improved, demonstrating improved coping ability with yoga.

Carson et al. (2012) conducted another RCT with the same protocol and measurement tools for the waitlist group, compared to a three-month follow-up report with the original trial test group for evaluation of sustainability. Majority of the results were mirrored in the waitlist group's trial except for, "more use of religious coping and more daily acceptance in the immediate treatment group" (Carson et al., 2012, p. 7). Additionally, the wait list group had lower TMS by 13.6 points ($\alpha \leq .01$) and tender points were three points lower ($\alpha \leq .01$), but the immediate group showed improvement respectively at the three-month follow-up (p. 8). Results showed improvement in the immediate group at follow-up with decreases in daily pain values

and FIQR scores (p.9). An association of more time practiced, and the efficacy of the intervention was shown in both groups. Some limitations to the study include a small sample size, no control group, and reliance of self-reported data.

Lynch et al. (2012) conducted a RCT analyzing the effects of Chaoyi Fanhuan Qigong (CFQ) on “pain, impact, physical function and mental function” (p.2). One hundred participants were divided into two groups, fifty-three in the immediate practice group and forty-seven in a wait-list group. CFQ training was given to the immediate group by a qualified instructor over a three-day period. The practicing group was trained on hexagram movements, emphasizing “softness, relaxation, downward releasing and full body distribution of qi” (Lynch et al., 2012, p.2). This was followed by daily at home practice over 45 to 60 minutes for eight weeks and weekly group practice. Outcomes were measured using an eleven-point numerical rating scale for pain intensity (NRS-PI), FIQ, PSQI, and the SF-36 health survey. The clinically significant results of the combined qigong scores of the immediate practicing and delayed practicing group are shown in the table below:

Variable	Usual care	Combined qigong	P-value*
A. NRS-PI¹			
2 months	4/45 (8.9%)	36/76 (47.4%)	<i>P</i> < 0.0001
4 months	7/44 (15.9%)	37/73 (50.7%)	<i>P</i> = 0.0002
6 months	8/44 (18.2%)	28/73 (38.4%)	<i>P</i> = 0.02
B. FIQ²			
2 months	9/45 (20.0%)	53/75 (70.7%)	<i>P</i> < 0.0001

4 months	13/44 (29.5%)	41/73 (56.2%)	<i>P</i> = 0.005
6 months	15/44 (34.1%)	41/73 (56.2%)	<i>P</i> = 0.02
C. PSQI³			
2 months	11/45 (24.4%)	39/76 (51.3%)	<i>P</i> = 0.004
4 months	10/44 (22.7%)	35/73 (47.9%)	<i>P</i> = 0.007
6 months	11/44 (25.0%)	36/73 (49.3%)	<i>P</i> = 0.01
D. SF-36 physical⁴			
2 months	4/45 (8.9%)	27/76 (35.5%)	<i>P</i> = 0.001
4 months	5/44 (11.4%)	24/73 (32.9%)	<i>P</i> = 0.009
6 months	6/44 (13.6%)	24/73 (32.9%)	<i>P</i> = 0.02
E. SF-36 mental⁴			
2 months	5/45 (11.1%)	29/76 (38.2%)	<i>P</i> = 0.001
4 months	6/44 (13.6%)	22/73 (30.1%)	<i>P</i> = 0.05
6 months	12/44 (27.3%)	26/73 (35.6%)	<i>P</i> = 0.35

Table 1: Individuals with clinically meaningful improvements

(Lynch et al., 2012)

These results demonstrate that CFQ can be utilized in patient self-practice to aid in symptom management of sleep quality, pain, mental and physical health, and quality of life. The immediate and delayed practicing groups reported comparable results, implying consistency in CFQ's efficacy. Symptom management was sustained over a six-month period, indicating possible long-term benefit. Additional analysis by Lynch et al. (2012) showed those who practiced at least five hours a week had greater improvement in all measurements compared to participants who reported minimal practice. They identified several limitations to this study

include: an unblinded trial; non-specific elements of practice; varying amount of practice time in participants; and focus on one of many forms of qigong (p.10).

Mindfulness Meditation

Cash et al. (2014) conducted a RCT investigating mindfulness-based stress reduction (MBSR) and perceived stress, pain, sleep problems, fatigue, symptom severity, and diurnal cortisol rhythm, and cortisol awakening response (CAR) in patients with FMS. Female participants were randomly divided, fifty-one in the treatment group, forty in a control group. Meetings with a trained instructor were held weekly, providing education in attention-focusing technique, sitting meditation, and simple yoga positions (Cash et al. 2014, p. 4). These were to be practiced at home daily for 45 minutes accompanied by a workbook and instructional audiotapes. Outcomes were measured with the perceived stress scale (PSS), visual analog scale for pain, standard sleep questionnaire (SSQ), fatigue symptom inventory (FSI), and FIQ. Groups met weekly with an instructor for two and a half hour durations over eight weeks. Participants were provided with instructional and discussion sessions and taught attention-focusing techniques, sitting meditation, and yoga positions. Participants were instructed to practice a minimum of three techniques for 45 minutes daily accompanied by instructional audiotapes.

These interventions produced significant reductions in sleep ($p = .038$), stress ($p = .000$) and severity of symptoms ($p = .012$), but did not improve physical function ($p = .172$), pain ($p = .068$) and fatigue. A positive correlation between frequency of practice and symptom relief was found, emphasizing the necessity of adequate practice time to provide symptom relief. Results were shown to be maintained in a two-month follow up. MSBR may be a viable therapy option to be incorporated into a patient's treatment regimen.

Jones et al. (2015) utilized a cross-sectional survey to analyze the relationship between patient mindfulness and FIQR scores, as well as, “determine if selected clinical or demographic variables were associated with mindfulness (p. 2)”. Participants were self-reporting HCP diagnosed FMS patients, totaling at 4,986. Participants were provided an online survey of the FIQR, and the Five Mindfulness Questionnaire (FFMQ). Findings indicated higher FIQR scores were linked to lower FFMQ values but scored higher in the observe subscale ($P > .000$) (Jones et al., 2015, p.5). A higher observe subscale score could be related to heightened sensory sensitivity seen in FMS (p.5). Of those surveyed, 15 percent practiced mindful movement therapies, and 25 percent reported an average 118 minutes of meditation per week (p.4). Those who practiced meditation had significantly lower FIQR scores ($p = .006$) compared to those who didn't. There was no supportive data in relation to demographic and clinical characteristics and mindfulness (p.6). Although there is an inverse correlation between FIQR and FFMQ scores, there was no clear definition of meditation provided to participants, leaving room for interpretation. Utilizing self-reporting diagnosis of FMS without researcher's confirmation from a HCP could have contributed to skewed results.

Van Gordan et al. (2016) conducted an eight-week RCT to evaluate the efficacy of meditation awareness training (MAT) on FMS. There was a total of 148 participants, seventy-four were in the MAT intervention group, and seventy-four in the control group undergoing cognitive behavioral training (CBTG). Outcomes were measured using the following: FIQR; Short-form McGill Pain Questionnaire (SF-MPQ); Depression, Anxiety, and Stress Scale (DASS); PSQI; Non-Attachment Scale; and civic engagement.

Van Gordan et al. (2016) reported, “overall, results demonstrate that MAT significantly outperformed CBTG at both post and follow-up assessment phases for all six outcome measures” (p. 197). FIQ-R, SF-MPQ, DASS, PSQI, NAS ($p < .001$ for all), and Civic engagement (post intervention $p < .01$, follow-up $p < .001$) were significantly reduced both in post intervention and at follow-up. This study supports the integration of meditation in FMS treatment to improve patient outcomes and quality of life. This study also suggests MAT is a more effective treatment option over CBTG. Limitations continue to be attributed to reliance on self-reported measures and short trial duration.

Guided Imagery

Onieva-Zafra et al. (2015) investigated the effects of guided imagery (GI) for pain management and depression in FMS patients using an eight-week two-group quasi-experimental study of 55 participants. They were provided in-person sessions of GI initially, followed by daily sessions at home with the original GI session recording on CD. Outcomes were measured using the McGill Pain Questionnaire long form (MPQ-LF), visual analogue scale for pain (VAS), Beck Depression Inventory (BDI), and VAS for depression. Results at week-four indicated a reduction of pain on the VAS ($p = .046$) reported by 28 participants, and in sensory pain ($p = .042$) and sensory plus affective subscales ($p = .049$) of the MPQ-LF (Onieva-Zafra et al. 2015, p. 18). BDI indicated improvement in depression throughout the trial ($p = .001$), but depression was not improved according to VAS ($p = .959$) (p.18). GI may aid some patients with pain and depressive symptoms and poses no adverse effects. GI is cost effective and can be integrated into home therapy with ease (Onieva-Zafra et al. 2015). Limitations to the study include uncontrolled

outside influences of participant's environments, as well as no information of changes in regular treatment.

Cognitive Behavioral Therapy

Castel, Cascon, Padrol, Sala, and Rull (2012) conducted a RCT hypothesizing that “multicomponent CBT treatments (CBT alone and CBT plus hypnosis) would provide greater benefits than standard care” (p. 256). Fourteen weekly CBT sessions included education on:

Pain perception theory, Schultz Autogenic Training, cognitive restructuring skills training, cognitive behavioral therapy for primary insomnia, assertiveness training, activity pacing and pleasant activity scheduling training, goal setting, and life values and relapse prevention (Castel et al. 2012, p. 256).

The CBT with hypnosis group received the same education but exchanged autogenic training for analgesic self-hypnosis training. Outcomes were measured using the NRS, Subscale of Catastrophizing from the Coping Strategies Questionnaire (CSQ), HADS, FIQ, and Medical Outcomes (MOS) Sleep Scale.

Results confirmed the hypothesis with statistically significant outcomes for both the CBT group and CBT plus hypnosis group over the standard care group. Both CBT groups showed improvement in pain intensity, catastrophizing, psychological distress, FIQ total score, sleep quantity, and sleep index problems ($p < .0001$) (Castel et al., 2012, p.259). Castel et al. (2012) found CBT with hypnosis to have amplified benefits in comparison to CBT alone for pain intensity and psychological distress ($p < .05$) (p. 262). The percentage of clinically significant difference in pain intensity and FIQ score are as follows:

OUTCOME	CONTROL GROUP	CBT ALONE	CBT PLUS HYPNOSIS
Pain Intensity			
Post-treatment	16.7%	8.8%	31%
3-month follow-up	10%	14.7%	17.2%
6-month follow-up	13.3%	17.6%	27.6%
FIQ			
Post-treatment	23.3%	55.9%	65.5%
3-month follow-up	20%	55.9%	69%
6-month follow-up	20%	58.8%	55.2%

Table 2: Percentage of clinically significant difference in pain intensity and FIQ score (Castel et al., 2012, p. 262)

The data shows an increase in pain reduction and FIQ score with both CBT and CBT with hypnosis. These values remained elevated at the six-month follow-up, indicating the potential for sustained symptom relief. Incorporation of CBT into standard treatment can increase quality of life and symptom management for patients with no known adverse effects. The researchers did not identify participants perceptions of hypnosis before the trial, which could have possible impacted the outcomes.

Discussion

The purpose of this review was to examine the current literature and identify therapies effective in symptom management and improved quality of life for FMS patients. The research identified in the review of the literature supports the use of various integrative and complementary therapies. MMT, mindfulness, GI, and CBT with hypnosis all had positive impacts for FMS participants in different capacities. A combination of the examined therapies could produce additive efficacy in symptom management and improved quality of life. Knowledge of the available effective integrative and complementary therapies may assist nurses and HCPs in developing treatment plans for FMS patients.

Mindful Movement Therapies

MMTs are comprised of different breathing techniques, exercises, postures, and meditation and awareness. MMT have been shown to be effective for various physical and psychological conditions, spiritual healing and awareness, increased energy, and stress reduction (Dupler, 2018; Chrisman, 2018). The current treatment recommendations for FMS suggests the inclusion of light exercise, but traditional exercises could be deemed too strenuous and counterintuitive for some patients.

Studies included in this review of literature examining MMTs addressing yoga, tai chi, and qigong and produced positive results in varying degrees. Research showed decreased FIQ scores, increased physical strength, decreased pain intensity, and increased physical functioning (Bongi et al, 2016; Carson et al, 2010; Carson et al, 2012; Lynch et al. 2012). MMT does not only aid in the physical status of the patient, but research showed improvements in sleep quality,

coping abilities, mental quality of life, fatigue and vitality (Bongi et al, 2016; Carson et al, 2010; Carson et al, 2012; Lynch et al. 2012). Despite improvements in physical and mental status, Bongi et al. (2016) did not show improvement in patient depression.

All studies examined implemented group and self-practice sessions. Self-practice sessions allowed patients to apply these therapies when appropriate. This promotes patient-centered care and opportunities for patients to be involved in their own treatment. FMS impacts patients differently and in varying intensities. Patients may tailor their MMT practices to an activity level that is suitable for the individual. Increased patient involvement in treatment may foster autonomy and increased self-esteem for patients with FMS.

Mindfulness Meditation

Mindfulness Meditation has been utilized for several purposes such as relaxation, detachment from physical pain, and cognitive thought processes. The primary objective of mindful meditation is to bring focus to oneself and increased self-awareness as a therapeutic technique to improve health and quality of life (Chrisman & Blackwell, 2018).

Jones et al. (2016) surveyed 4,986 patients with FMS and found a correlation of higher FIQR scores and lower FFMQ, suggesting that less meditation and mindfulness in patients may be associated with increased symptom severity and impact on quality of life. Participants of this survey did paradoxically have high scores in the observe subscale of the FFMQ. This could be attributed to the disease process of FMS itself. FMS is hypothesized to be associated with increased sensitivity to outside stimuli, which may lead patients to be more observant of

conditions that worsen pain. Further studies are needed to investigate the association between patient perceived mindfulness and reduced symptom severity.

MSBR was developed by Kabat-Zinn with origins in Buddhism. MSBR can help patients develop coping skills for chronic illnesses by “focusing one’s attention to awareness of mind and body” (Newton, 2014, p. 1620). Cash et al. (2014) were able to identify a decrease in sleep disturbance, stress, and severity of symptoms in FMS patients after MSBR training. This RCT did not produce significant results in regards to physical functioning, pain, and fatigue. Although MSBR did not improve patient’s physical status, MSBR may be an appropriate treatment modality for patients who are significantly limited in mobility and find MMT to be too physically demanding.

Guided Imagery

GI is defined as “the use of relaxation and mental visualization to improve mood and/or physical well-being” (Ford-Martin, 2018). There are several forms of GI such as healing, relaxation, mental rehearsal, and pain control imagery. GI imagery has been used several conditions including management of anxiety, stress, and chronic pain. These conditions are often associated with FMS patients. This implies that GI may be incorporated into FMS treatment plans to reduce these symptoms.

Onieva-Zafra et al. (2016) utilized a script resembling pain control imagery, where patients were asked to visual their pain and contemplate its significance. Onieva-Zafra et al. demonstrated in their study the efficacy of GI in pain management and depression for FMS patients. Improvements in pain management may subsequently lead to decreased depression and

increased quality of life. Although participants in this study reported reduced pain and depression after GI therapy, the long-term efficacy remains questionable. Further research investigating the longitudinal results of GI for FMS treatment is needed.

GI is a highly accessible treatment option for patients. It can be applied either in a face-to-face setting or with the use of audio recordings. GI has virtually no adverse effects and can be relatively simple to incorporate into a patient's treatment regimen. Although GI is accessible to a number of patients, the patient's perception of GI as a therapy and environment can possibly negatively influence the outcomes. It is recommended to be used in conjunction with traditional treatments but not as a substitute (Buren & Atkins, 2012).

Cognitive Behavioral Therapy

CBT is a psychosocial therapy used to aid patients in identifying and adjusting maladaptive thought processes and behaviors. Castel et al. (2012) research shows CBT had superior results over standard care alone for FMS patients. Patients received education on pain perception, activity pacing and scheduling, goal setting, cognitive restructuring, and relapse prevention. Education in activity planning and scheduling can aid FMS patients in coordinating their daily activities in periods of reduced pain and decrease overexertion. Patients can implement these techniques before activities of pleasure and productivity, leading to a plausible increased quality of life.

The addition of hypnosis to CBT revealed further benefit for pain intensity and psychological distress in FMS patients. The effects of CBT with and without hypnosis displayed sustained improvement in pain intensity and FIQ scores over a six-month period (Castel et al.

2012). Further research is needed into the mechanisms and effects of hypnosis for chronic pain conditions. The incorporation of CBT with hypnosis into standard care may provide patients with sustainable symptom relief and the skills to manage their disorder. Further longitudinal research is needed regarding CBT with hypnosis.

Limitations

There were several limitations that impacted this review of literature. Search results produced several original research articles, but most studies had inadequate sample sizes. Research utilizing small sample sizes cannot be generalized to the FMS population. Many articles produced by the search criteria did not specify if patients continued or had changes made to their normal plan of care for the duration of the trials. This makes it difficult to discern if patient reported changes were attributed to the tested interventions or a change in their primary treatment and pharmacologic therapies. Reliance on patient-reported results can pose limitations in reliability and possible bias. Majority of the research found were short-term eight-week studies, with a noted deficit of longitudinal studies. Without extended studies, it is difficult to discern if the tested interventions provide long-term benefits.

Implications for Nursing

Nursing Research

Majority of the studies reviewed were original RCTs. These RCTs had relatively small sample sizes. Several original research articles were identified with the initial search of the literature, but due to the small sample sizes were excluded from analysis. Further research needs to be conducted on a larger scale to generalize results to the FMS population.

The articles reviewed were limited in duration to eight-weeks and two six-month follow up reports. Although improvements were reported by patients, it is unclear if these therapies provided lasting relief. Because FMS is a chronic and progressive condition, it is vital to analyze the longevity of the symptom relief from these therapies. The body of FMS research would benefit from more longitudinal studies regarding integrative and complementary therapies.

The disciplines of Tai chi, Yoga, and Qi Gong have a multitude of different styles. These sub-disciplines focus on different aspects of movement, breathing techniques, and mental focus. It is unclear which aspects of these MMTs provide symptom relief. Further research is needed to identifying specific styles and the effectiveness for FMS treatment. Comparison within an area of practice is needed to identify therapy options with maximum benefit to patients. Current research indicates an association with improved symptom management and total time actively utilizing MMT. Additional research is needed to determine appropriate recommendations in practice times and for patient goals in MMT.

Education

Nurses are responsible for comprehensive assessments of patients, thus it is essential to be educated on the FMS population and presentation of symptoms for proper nursing diagnosis and treatment. Because FMS presents in an array of symptoms, it can be difficult to identify without adequate education. Studies show a correlation between FMS diagnosis times and patient satisfaction (Choy et al., 2010). Nurses can contribute to reducing delays in diagnosis with increased education on the pathophysiology of FMS.

To apply the latest evidence-based practice, nurses must be familiar with current standards of care and research. FMS affects patients differently and with varying severity scales. This can make it difficult to identify therapies that are conducive for the patient's well-being. Nurses often provide treatment recommendations to the PCP, therefore it is important for the nurse to be educated in integrative and complementary treatments. Nurses educated in these therapies can provide PCPs with patient-focused treatment recommendations. Nurses are also responsible for patient education. Patients need education on the basic pathophysiology as well as possible treatment options and local resources in order to make educated decisions about their healthcare.

Nursing Practice

Knowledge of FMS's etiology, pathophysiology and available treatments can aid the nurse in developing appropriate nursing care plans. An in depth accurate assessment of both physical presentations and impact on patient quality of life develops a robust database for accurate selection of nursing diagnosis specifically tailored to the individual patient. Once nursing diagnosis are established, the nurse is responsible for identifying patient outcomes,

interventions, and evaluations of treatment with the goal of disease management and increased quality of life. Nurses are also involved in the procurement of available resources and initiation of treatment through other healthcare disciplines. It is essential for nurses to advocate for the overall care of patients. Being knowledgeable in integrative and complementary therapies that are effective in FMS can provide nurses with the tools to recommend therapies to HCPs and patient education. These may include MMT, GI, mindfulness meditation, and CBT. Nurses also play a vital role outside of the clinical setting. Increasing public knowledge of FMS as a legitimate chronic illness may lead to decreasing the stigma that is often associated with the disease.

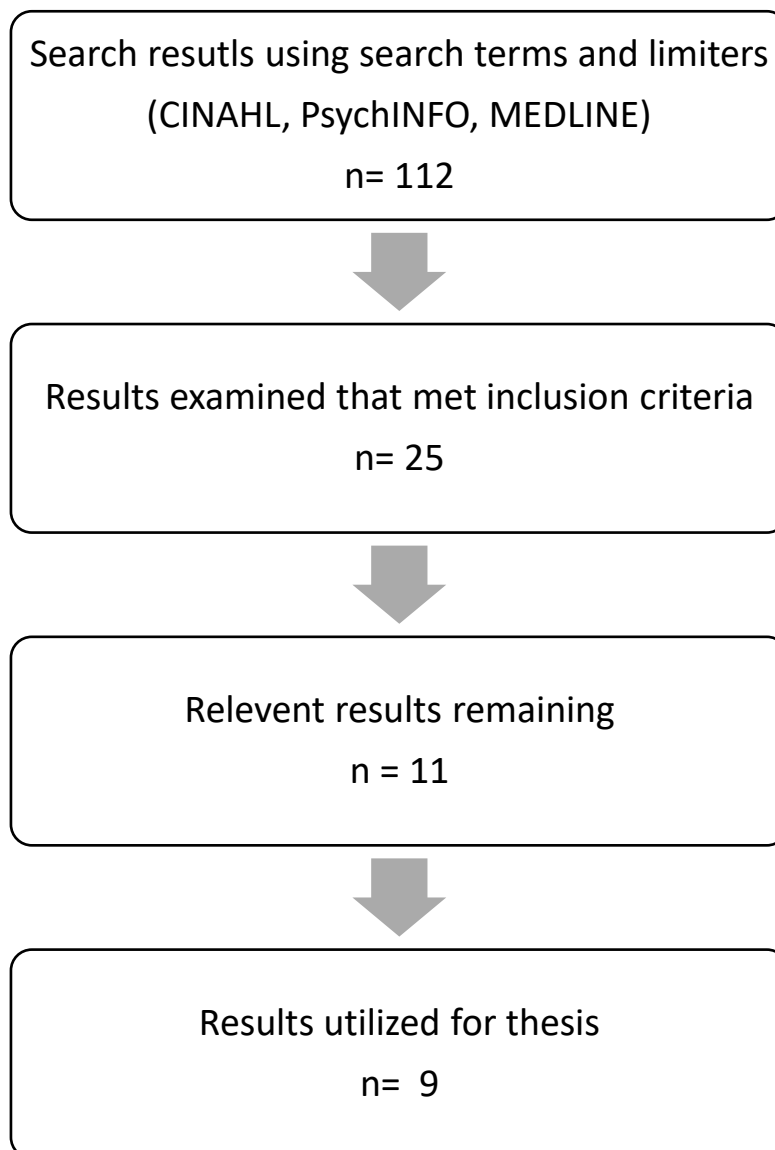
Conclusion

Research shows integrative and complementary therapies including MMT, mindfulness meditation, GI, and CBT with hypnosis can produce positive outcomes for patients with FMS. These therapies in conjunction with standard treatment and pharmaceuticals may effectively manage symptoms and improve quality of life for patients. Nurses can provide patients with education and encourage the integration of these therapies into patient treatment regimens. Treatment should be individualized and tailored to patient needs. Research is recommended to further investigate longitudinal effects to determine longevity of therapeutic results.

APPENDIX A: SELECTION METHOD OF LITERATURE

Figure 1: Selection Method of Literature

Key Search Terms = Inclusion criteria are Fibromyalgia AND alternative therapies, or integrative, or integrative therap*, or complementary therap*, or complementary medicine, or medicine Chinese Traditional, AND adult#. Year inclusion limited to 2012 to 2017. Limiters= NOT adolescent* or juvenile* or teen* or youth or child*. Language limited to English.



APPENDIX B: TABLES OF EVIDENCE

TABLE 1**. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia**

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Bongi, S., Paoletti, G., Cala, M., Del Rosso, A., Aufy, K., & Mikhaylova, S. (2016).	RCT N= 44 FIQ, Short Form 36 (SF-36), Health Assessment Questionnaire (HAQ), Functional Assessment of Chronic Illness-Fatigue (FACIT-fatigue), Pittsburgh sleep Quality Index (PSQI), Hospital Anxiety and Depression Scale (HADS), Widespread Pain Index (WPI), Tender Points Evaluation (TPE)	FMS patients diagnosed according to American College of Rheumatology. Practice twice a week for 16 weeks, each session 60 minutes. Daily home exercise in two sessions with instructional DVD.	Evaluate the efficacy of the Tai Chi on Quality of Life, disability, pain, tenderness, psychological distress and sleep.	TJQ improved anxiety, sleep quality and duration, no improvement in depression. Improvements with health related quality of life (HRQol), fatigue and disability, referred pain and induced tenderness.	Training is safe, no adverse effects, well accepted by patients due to training level being patient centered. Future research with standardized exercise protocols.

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Carson, J.W., Carson, K.M., Jones, K.D., Bennett, R.M., Wright, C.L., & Mist, S.D. (2010).	RCT N = 53 FIQR, Patient Global Impression of Change (PGIC), Total Myalgic Score (TMS), Timed Chair Rise, Sensory Integration for Balance Test (SCBT), Chronic Pain Acceptance Questionnaire (CPAQ), Coping Strategies Questionnaire (CSQ), Vanderbilt Multidimensional Pain Coping Inventory (VMPCI), Daily	All women over 21 years of age. FM diagnoses with ACR criteria. 8-week long program, once-per-week 120 min group classes in exercise studio. Groups led by certified yoga teacher.	Yoga would be superior to a wait-listed standard care condition on measures of FM symptoms and function deficits, and pain coping strategies.	Improvements in FIQR, PGIC, TCR, no improvement in TMS. Improvement in CSQ, VMPCI, activities engagement despite pain.	Higher attendance associated with less fatigue, improved FIQR. Findings suggest beneficial in how patients cope with pain. Improvement in symptoms and pain, fatigue, stiffness, poor sleep, depression, poor memory, anxiety, tenderness, poor balance, environment

TABLE 1**. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia**

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
	diaries – pain, fatigue, distress, vigor, acceptance and relaxation.				sensitivity, vigor, and limited strength.
Carson, J.W., Carson, K.M., Jones, K.D., Mist, S.D., & Bennett, R.M. (2012)	RCT N = 39 FIQR, PGIC, TMS, TCR, SCBT, CPAQ, CSQ, VMPCI, daily diaries.	Women at least 21 years of age diagnosed with FM by American College of Rheumatology (ACR) criteria for at least 1 year. 21 participants from original trial, and 18 from wait-list from original trial.	Evaluate if yoga of awareness effects on waitlist from original study, and 3-month follow up of original treatment group to determine if improvements were sustained. Examine associations between yoga home practice rates and treatment outcomes.	Sustained improvement to original group in FM symptoms, functional deficits, coping abilities. Results replicable and can be maintained. Differences between groups in TMS, lower in wait-list group.	Provides FMS patients with exercise and coping skills. High adherence to program after completion.
Cash, E., Salmon, P, Weissbecker, I., ... &	Randomized control trial N= 91	Female fibromyalgia patients 18 years and older. Physician-verified diagnosis.	Mindfulness-Based Stress Reduction (MBSR) effects on the defining	MBSR reduced perceived stress and	Study showed some improvement in symptom

TABLE 1
. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Sephton, S. (2014).	Perceived Stress Scale, Visual Analog Scale for pain, Stanford Sleep Questionnaire, Fatigue Symptom Inventory, FIQ.	Weekly group meetings, 2.5 hour sessions over 8 weeks with experienced instructor. Therapies included instructional/discussion, attention-focusing technique, sitting meditation, yoga positions. Practice three techniques 45 minutes a day, 6 days a week. Audiotapes.	symptoms and neuroendocrine aberrations associated with fibromyalgia: perceived stress, pain, sleep problems, fatigue, symptom severity, and diurnal cortisol levels	severity of symptoms, maintained at 2 month follow-up. Improvements in sleep not reported in secondary analyses. No improvement physical function. Did not observe improvements in pain and fatigue. Frequency of practice showed greater symptom relief.	severity, increase in practice time contributes to more effective treatment.
Castel, A., Cascon, R., Padrol, A.,	Design: Randomized Controlled Trial	FM diagnosis ages 18-64, average age of 49.6. No additional severe	Multicomponent CBT treatments would provide	Patients with FMS with CBT alone or	Integration of CBT and hypnosis with

TABLE 1
. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Sala, J., & Rull, M. (2012).	N = 87 Numeric Rating Scale (NRS), Subscale of Catastrophizing From the Coping Strategies Questionnaire (CSQ), Hospital Anxiety and Depression Scale (HADS), Fibromyalgia Impact Questionnaire (FIQ), Medical Outcomes Study (MOS) Sleep Scale	chronic medical pain conditions or cognitive impairment. Pain history average of 12.6 years. 96.8% women, 3.2% men. 14 weekly, 120-minute group CBT sessions. Audio CD of training program included.	greater benefits than standard care (pharmacological). Addition of hypnosis to CBT treatment enhances efficacy.	with hypnosis showed greater improvement than those only on standard care. CBT with hypnosis showed greater improvement than only CBT.	standard treatment for FMS.
Jones, K., Mist, S., Casselberry, M., Ali, A., &	Cross-sectional survey N= 4986	Ages 21-89 years old with healthcare provider diagnosis of FM from FM support	Examine relationship between mindfulness and FIQR scores in large FM population.	62% reported medication did not alleviate symptoms. 47% endorsed	Findings of meditation practice needs to be followed up

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Christopher, M. (2015).	Five Facet Mindfulness Questionnaire (FFMQ) and FIQR	and advocacy organization. Two standardized questionnaires (FIQR and FFMQ)	Impact of having current meditation practice on self-reported mindfulness and FM, determine if selected clinical/demographic variables associated with mindfulness.	using at least 3 non-pharmacologic methods to reduce symptoms. Less than 15% practice MMT. 24% meditate regularly. More severe FIQR associated with less mindfulness. FFMQ subscale of observe results high in comparison to remaining 4 subscales. May be related to heightened CNS	with clinical study examining dosages and types.

TABLE 1**. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia**

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Lynch, M., Sawynok, J., Hiew, C., & Marcon, D. (2012).	Design: Randomized controlled trial N = 100 11-point numerical rating scale for pain intensity (NRS-PI), Fibromyalgia Impact Questionnaire (FIQ), Pittsburg Sleep Quality Index (PSQI), SF-36 Health Survey.	Patients meet College of Rheumatology criteria for fibromyalgia. Average pain scale 4 over 7 days. Exclusion if already qigong practitioners or compromising medical conditions. Pain Management Unit, Queen Elizabeth II Health Sciences Center, Halifax, Nova Scotia.	Compare the effects of self-practice of qigong with a control group over six-months.	sensations related to FM. Statistically significant reduction in pain at all times compared to wait list/usual care group. FIQ scores reduced by 17-18 units from baseline. PSQI improved in immediate and delayed CFQ groups	CFQ (form of Qigong with loose, gentle with no aerobic element) potentially useful for FMS patients – improvements in pain, FIQ, sleep, physical and mental function. Issue in how much practice and how to sustain benefit.
Onieva-Zafra, M. D., Hernandez	2-group quasi-experimental study	Guided imagery CD developed by authors. First week therapy	Evaluate the effects of guided imagery as a nursing	n = 28 reported reduction in pain, no	Guided imagery inexpensive,

TABLE 1**. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia**

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
Garcia, L., & Gonzalez del Valle, M. (2015).	N =55 McGill Pain Questionnaire long form (MPQ-LF), Visual Analogue Scale (VAS), Beck Depression Inventory and VAS for depression,	carried out by authors for 15 minutes. Home use of CD at least 4 days in first week, every day during second week. 8 week long trial.	intervention for pain management and depression in patients diagnosed with fibromyalgia	further reduction by week 8. Improvement in daily pain scores by week 8 (rest and movement). Depression improved by week 4, no improvement from week 4 to 8.	simple to implement, readily available, no adverse effect. Possible improvements for symptom management in FM.
Van Gordan, W., Shonin, E., Dunn, T., Garcia-Campayo, J., & Griffiths, M. (2016).	Random Control Trial N= 74 FIQR, Short-form McGill Pain Questionnaire (SF-MPQ), Depression,	Current diagnosis of FMS from FMS self-help groups, posters in GP, emails. Age 18-65, not undergoing psychotherapy, not currently practicing mindfulness or meditation, no changes in psychopharmacology.	Empirical assessment of effectiveness of an Second Generation – Mindfulness-based interventions (SG-MBIs) for treating FMS.	Significant relationship between number of minutes meditated and outcome differences. Non-attachment to	MAT effective FMS treatment, focus on ‘self’ for FMS patients could be conducive to treatment.

TABLE 1
. Summary Table of Research Literature on Integrative and Complementary Therapies for Fibromyalgia

Study	Design, Sample, and Scales	Participants and Settings	Aim	Key Findings	Suggested Interventions
	Anxiety, and Stress Scale (DASS), Pittsburgh Sleep Quality Index (PSQI), Non-Attachment Scale (NAS)	8-weekly workshops/2hr and CD.		the self and environment effects FM symptoms. Improvements over control group in levels of FMS symptomology , lasting until six month follow-up.	

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