SOUTH BAYLO UNIVERSITY

Clinical Study on the Treatment of Fibromyalgia using Sa-am (4-Needling) Acupuncture

섬유근육통 증후군에 대한 사암침법 효과에 관한 임상연구

by

Jin Hyang Ryu

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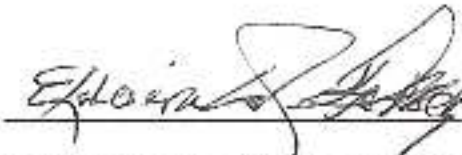

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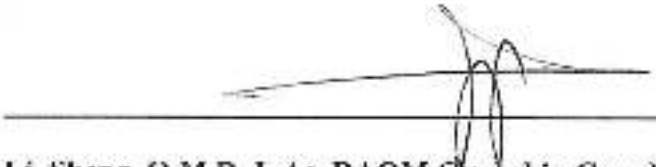

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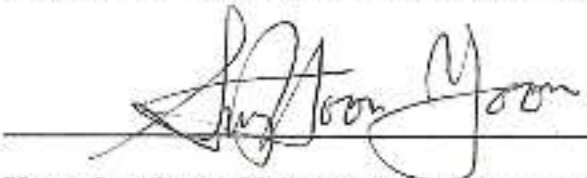

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SOUTH BAYLO UNIVERISTY AT ANAHEIM, 2017

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ABSTRACT

The objective of this study is to evaluate the effectiveness of Sa-am (4-Needling) Acupuncture in the treatment of Fibromyalgia (FM). Twenty (n=20) patients with fibromyalgia were randomly allocated into 2 groups including the control group (CG) and the experimental group (EG). The CG were treated with traditional acupuncture and the EG were treated with Sa-am acupuncture. They were treated for 8weeks. Each patient was treated for 50 minutes with supine and prone positon twice a week. The primary effectiveness of treatments was evaluated using Visual Analog Scale of Pain Measurement (VASPM) and Revised Fibromyalgia Impact Questionnaire (FIQR). The secondary output was analyzed using SPSS for window (SPSS ver. 18.0). The reduction of the mean of total FIQR of the EG using Sa-am acupuncture was -86.1 and the reduction of the mean of total FIQR of CG using traditional acupuncture was -44.9 ($p < 0.0001$). Sa-am acupuncture was better than traditional acupuncture for reducing pain (Sa-am acupuncture, -4.8; traditional acupuncture, -3.2: $p < 0.0001$). In a conclusion, Sa-

am acupuncture was more effective than traditional acupuncture for overall treatment of fibromyalgia.

Key words: Sa-am (4-needling) Acupuncture, Traditional Acupuncture, Fibromyalgia, FIQR, VASPM

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Jinhyang Ryu

I. INTRODUCTION

Fibromyalgia (FM) is nonspecific rheumatism in which typical symptoms are chronic widespread musculoskeletal pain and stiffness with accompanying fatigue, anxiety, sleep disorder.[1] According to the American College of Rheumatology's 1990 criteria for classification of fibromyalgia, two key components to diagnosis are: 1.) Widespread pain

Table 1. ACR Anatomical Tender Points for Fibromyalgia

Point #	Description of Point Location [3]	Corresponding Acupuncture Points Nearby [4]
1	At the sub-occipital muscle insertion near the occiput	engchi GB-20
2	At the anterior aspects of the intervertebral spaces at C5-C7	Huatojiaji points for C5-C7
3	At the midpoint of the upper border of the trapezius	Jianjing GB-21
4	Superior to the scapular spine, at muscle attachments to upper medial border of the scapula, on the supraspinatus muscle	Quyuan SI-13 or Jianzhongshu SJ- 15
5	At the second rib space, about 2 cm lateral to the sternal border	Yuzhong KD-26
6	At muscle attachments to lateral epicondyle, about 2 cm distal	Quchi LI-11
7	In the upper and outer quadrants of the buttocks, in the anterior fold the gluteal muscle	Baohuang BL-53
8	At muscle attachments just posterior to the prominence of the greater trochanter	Ashi Points
9	At the medial edge of the fat pad proximal to the knee joint line	Ququan LV-8

involving both sides of the body above and below the waist as well as in the axial skeletal system. 2.) Pain for at least three months on at least 11 out of 18 tender points from among the nine pairs of specified sites shown in Table 1. [2]

This disease appears to affect increasing numbers of people, with a disabling outcome on their quality of life. [5] It appears that the incidence of disease tends to increase with age, with an occurrence rate of 9.2% in geriatric outpatients. [6] Its obvious pathogenic factors and its treatment methods, however, are not well clarified these days. [7] Recently many reviewed articles about the treatment of Fibromyalgia have been published involving different pharmacologic agents including nonsteroidal anti-inflammatory drugs (NSAIDs), opioid and nonopioid analgesics.[8, 9] None of these medications have proven to be effective for the entire scope of symptoms and disabilities associated with Fibromyalgia. [4]

Natural therapies, which are yoga, exercise, biofeedback, and acupuncture, began to emerge for novel method for fibromyalgia these days. [10, 11] The most recent reports indicated that almost every Fibromyalgia patient had used at least one complementary and alternative medicine (CAM) therapy for the management of Fibromyalgia in the past, with the majority being heat application or thermal baths (67.0%), CAM medications such as homeopathy, dietary supplements, and vitamins (35.2%), some kind of diet (34.6%), tool based physical therapies such as acupuncture (28.5%), and meditative exercises such as yoga or tai chi (18.4%). [12] As you see, it indicates that acupuncture treatment is a good natural therapy.

In Traditional Chinese Medicine (TCM) theory, Fibromyalgia is mainly caused by emotional upsets, which affect the Liver. Stagnation of Qi activity leads to the stasis of Blood, which causes pain. The principle of treatment is regulating the Qi and Blood, combined with dispelling Cold and removing Damp.[13] TCM is a whole system to treat Fibromyalgia. Recently many studies have detailed the use of acupuncture as treatment for chronic pain [13, 15-20] and as a treatment for Fibromyalgia.[3, 19, 21-25, 28] The objective of this research is to evaluate the effectiveness of Sa-am acupuncture to treat Fibromyalgia. Sa-am acupuncture, most commonly known today as the "Korean Four Needle Technique" is a relatively new system of acupuncture that has its roots firmly planted in the great classics of Chinese medicine. It can be combined to simultaneously correct interruptions and imbalances as well as have tonification-sedation effects. It is also very powerful and safe acupuncture technique because all acupuncture points of Sa-am acupuncture are below elbows and knees. The boundary of Sa-am acupuncture is limitless to approach the disease, for it can be applied not only to the physical but also to the psychological state of the patient. According to recent reports, Sa-am acupuncture has extraordinary effectiveness for treatment of shoulder, knee, low back, insomnia, and depression.[29] These symptoms are representative symptoms for Fibromyalgia.

The basic characteristic of combining five shu points in Sa-am acupuncture is the selection of the tonification and sedation points along the self-meridian and other meridians based on creation and governor relationships. In China, five element acupuncture, tonification, and sedation points along only the self-meridian are selected. Japanese meridian therapy added source point, connecting point, cleft point, alarm point, and transport point on the basis of Korea Sa-am acupuncture conception of the combined

five shu points. [30] Sa-am acupuncture is based on the traditional concepts of yin-yang, five elements, ZangFu (viscera and bowels), Qi, and meridians. Sa-am acupuncture treatment cannot be separated from these viewpoints. In particular, it involves the application of five shu points according to the creation and control cycles of the five-element theory. Therefore, the combination of acupoints in Sa-am is easier to understand from the perspective of traditional medicine. The meridian is divided into three parts: the arm or foot, three yin and yang, and six ZangFu parts. A total of 24 deficiency and excess symptoms, with 24 coldness and fire symptoms, exist across the 12 meridians, but the diagnostic criteria related to these symptoms are too ambiguous for selecting a correct meridian. Except for the regular 48-treatment protocol, the treatment strategies are largely variable. Efforts were made to produce Sa-am treatments that are more effective by including other acupoints, with the main points firmly based on the regular pattern. [31] Sa-am acupuncture may be novel elegant and effective method to treat Fibromyalgia patients.

II. OBJECTIVES

The overall objective of this study is to investigate the effectiveness of Sa-am (4-needling) acupuncture in the treatment of fibromyalgia. The research was conducted based on the clinical randomized trial design in which the experimental group with Sa-am acupuncture was compared with the control group treated with the traditional Chinese acupuncture.

Specific objectives are:

Object 1. To evaluate the effectiveness of Sa-am Acupuncture in the reduction of pain for fibromyalgia.

Object 2. To evaluate the effectiveness of Sa-am Acupuncture in restoring functionality of fibromyalgia.

III. LITTERATURE REVIEW

3.1. Main symptom and criteria for classification of Fibromyalgia

The main symptom of Fibromyalgia is widespread muscular skeletal pain. Commonly, patients can clearly recognize where he or she has pain if the pain turns up to local area in body. However, they cannot perceive where they have pain if the pain is widespread in body. Especially, it's too hard to explain where they have the pain. The patient with fibromyalgia has pain as well as stiffness, edema, oppressive pain, etc. Normally, they have severe fatigue, insomnia, anxiety, and depression. Moreover, it synchronizes chest pain, paramenia, dysaesthesia, palpitation, dizzy, irritable bowel syndrome, irritable bladder syndrome, digestive disorder, etc.[32] According to the American College of Rheumatology 1990 classification criteria for fibromyalgia, anatomic location of tender points are 18 points.[2-3, 33] Tender Points for Diagnosis of Fibromyalgia were showing figure 1.[34]

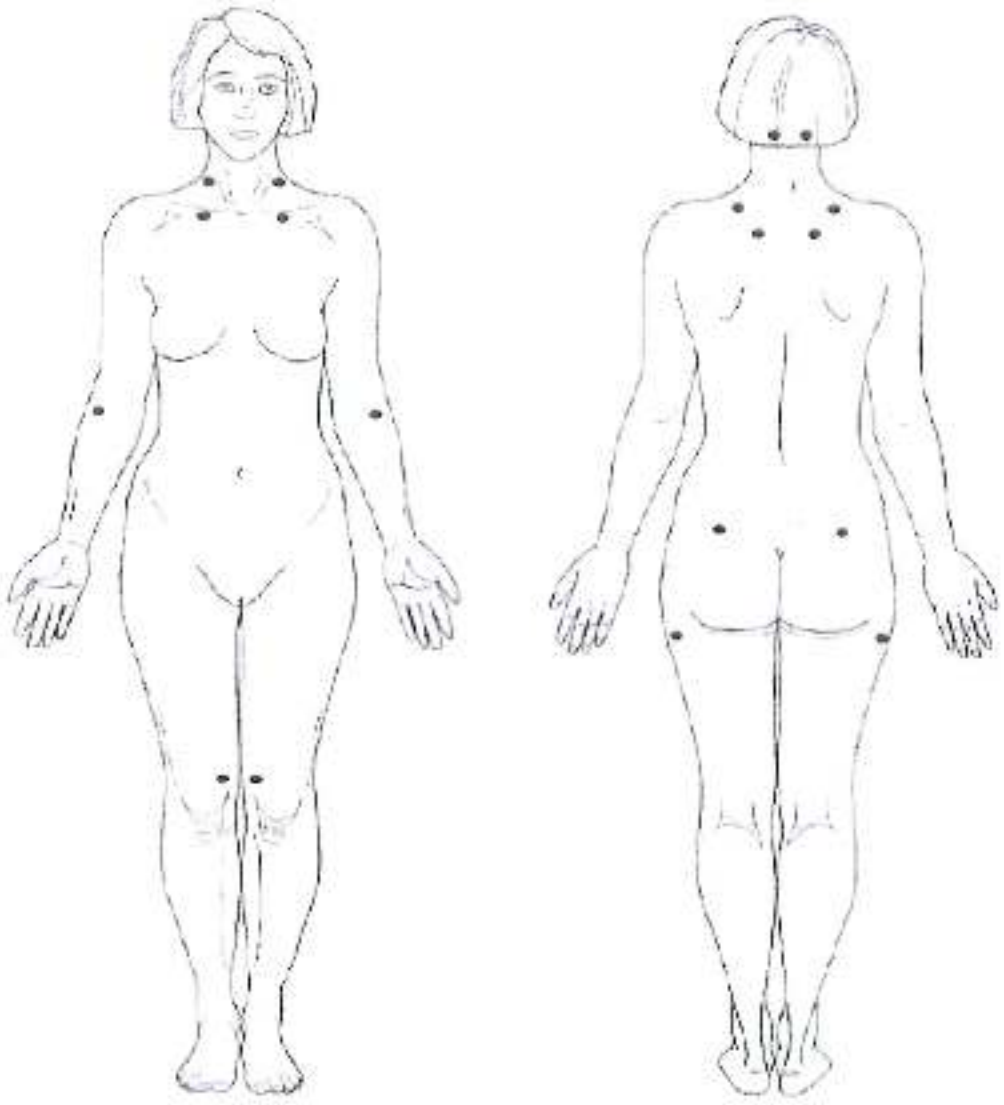

Figure 1. Tender Points for Diagnosis of Fibromyalgia

3.2. Differential Diagnosis of Fibromyalgia

Fibromyalgia has various symptoms, so sometimes it could be easy to make a misdiagnosis. Especially, chronic fatigue syndrome and myofascial pain syndrome are

similar with fibromyalgia. It is necessary to get the differential diagnosis to make exact diagnosis for fibromyalgia.

3.2.1. Difference between Fibromyalgia and Chronic Fatigue Syndrome (CFS)

Fibromyalgia and chronic fatigue syndrome (CFS) are both illnesses characterized by extreme amounts of fatigue. In fact, the conditions seem to be so intertwined that the medical community continues to debate whether fibromyalgia fatigue is simply a different expression of the same disorder that causes CFS. Statistically, fibromyalgia fatigue occurs in more Americans than chronic fatigue syndrome. The U.S. Centers for Disease Control and Prevention believes there are about 5 million people in the United States with fibromyalgia, compared with a little over 1 million people with chronic fatigue syndrome. Still, research has found that the line between fibromyalgia fatigue and chronic fatigue syndrome is a very thin one. The Arthritis Foundation estimates that 50 to 70 percent of people with fibromyalgia also fit the criteria of chronic fatigue syndrome. Research into each disease grew out of different medical fields. Fibromyalgia researchers are primarily rheumatologists and arthritis experts. Chronic fatigue syndrome researchers most often are immunologists and virus experts. Because of this, fibromyalgia has been thought of as a muscle disorder while chronic fatigue syndrome has been linked to viral infections - despite their similarities. Chronic pain and fatigue are common symptoms of both fibromyalgia and chronic fatigue syndrome. The difference is that, in fibromyalgia, fatigue often takes a backseat to debilitating muscle pain. In chronic fatigue syndrome, people have an overwhelming lack of energy, but also can experience some pain. Some

more important differences between the two include: 1. Many people diagnosed with fibromyalgia fatigue report that their symptoms followed some sort of trauma - a physical injury or an emotional shock. On the other hand, chronic fatigue syndrome appears to spring from a viral infection like mononucleosis or influenza; 2. People are diagnosed with fibromyalgia fatigue if they feel tenderness or pain in at least 11 of 18 distinct locations on their bodies. People with chronic fatigue syndrome do not have these pain sites; 3. People with chronic fatigue syndrome often complain of fever, swollen glands, and other signs of inflammation. Doctors find no evidence of inflammatory response in patients with fibromyalgia fatigue; 4. Although chronic fatigue syndrome and fibromyalgia are both associated with disrupted REM sleep, a recent study from Japan found key differences in other sleep disturbances between people with CFS alone and those with CFS and fibromyalgia.[35, 36]

3.2.2. Difference between Fibromyalgia and Myofascial Pain Syndrome (MPS)

Myofascial Pain Syndrome and fibromyalgia may coexist, presenting a complex clinical picture; however, fibromyalgia and myofascial pain syndrome are not one and the same condition. Fibromyalgia is a generalized amplification of pain or hypersensitivity condition and is associated with tender points in the muscles. Tender points are focal areas of muscle tissue that are exquisitely tender to compression. The tender points of fibromyalgia are painful locally at the site where the pressure is applied, without referred pain to distant areas. By contrast, myofascial pain syndrome is considered in the narrow definition to be a disorder of trigger points. Similar to tender points, trigger points also

are discreet areas in muscle tissue and/or its associated fascia that are exquisitely tender to compression; however, unlike tender points, when pressure is applied to the trigger point, pain occurs not only at the site of the applied pressure, but also at a distant site (zone of pain referral). Trigger points are found in taut bands (firm elongated bands) within the muscle fibers and are associated with the local twitch response. This local twitch response is an involuntary transient contraction of the taut band muscle fibers and can be elicited by snapping or pinching the taut band. Some authors assert that both disorders (fibromyalgia and myofascial pain syndrome) can magnify and perpetuate the symptoms of the other.[37, 38]

3.3 Interpretation as Traditonal Korean (Chinese) medicine of fibromyalgia

Fibromyalgia is a kind of current disease name. Nonetheless, there is no information from the ancient books for fibromyalgia. However, according to Korean (Chinese) medicine, fibromyalgia is like to relative to Bi syndrome, because the main symptom of fibromyalgia is widespread muscular skeletal pain.[39] Bi syndrome has pain because external pathogenic factors like wind, coldness, and dampness exist at the body. External pathogenic factors invade our body, so it interrupts the circulation of Qi and blood, and it made pain. According to several published article, the solution to remove the external pathogenic factors like wind, coldness, and dampness.[39] Additionally, the principle of treatment is regulating the Qi and Blood, combined with dispelling cold and removing damp. Moreover, severe stress is main cause to make fibromyalgia, so the pain of fibromyalgia is from the Qi stagnation.

3.3.1. Case Study for Fibromyalgia

There were used three kinds of searching system, which were Korean Traditional Knowledge Portal (http://koreantk.com), Oriental Medicine Advanced Searching Integrated System (https://oasis.kiom.re.kr), Research Information Sharing Service, RISS (www.riss.kr) for a collection of information about acupuncture treatment of Fibromyalgia with Korean internal journal. Search word was 'Fibromyalgia and Acupuncture'. There were 12 journals to be relative with 'Fibromyalgia and Acupuncture'. Total 63 acupuncture points were used at 12 journals. These acupuncture points and results are on the Table 2. Acupuncture points as many as two more journals are: BL23 (at 5 journals), GB30 (at 4 journals), GV03 (at 3 journals), BL25, BL24, ST36, LR03, GB21 (each at 2 journals). Lee's Group (2006) used quadratus lumborum TP (trigger point) and iliopsoas muscle TP. Lee's Group (2011) used Hwa acupuncture. There was only 1 group to use Sa-am acupuncture, which was Jang's Group (2014). They used Sa-am acupuncture: Stomach-tonification, Lung sedating acupuncture, Gall bladder-tonification, Samcho-tonification. Main result was improved.

Table 2. Characteristics of Case Study of Fibromyalgia

First author (year)	Number of cases, patient(s), treatment period	Acupuncture points	Main Result
Kim[37] (2004)	n=1, F/61, 8 days	1. GV5, GV4, GV3, GV2, BL22, BL25, BL25, BL24, GB30, Palyo,Yoan 2. Electroacupuncture	Improved Improved
Cho[41] (2005)	n=1, F/46, 28 days	1. BL23, GV3, BL60, KI3, GB30, ST36, BL40, GB41, etc.	Improved
Lee[42] (2006)	n=2 1. M/21, 54 days(11 times) 2. M/22, 57 days(12 times)	1. BL23, BL24, BL25, GB30, BL40, GB34, BL60, ST36, GB20, GV16, BL1, GV14, TE17, quadratus lumborum TP, iliopsoas muscle TP 2. Ohaeng acupuncture: HT7 (tonification), LU9 (sedation)	Improved Improved
Yim[43] (2010)	n=1, F/46, 31 days	1. Low pack and leg 2. Warming acupuncture: neck, low back etc.	1. Improved 2. Improved
Lee[44] (2011)	n=1, F/43, 1) 19 days, 2) 12 days	1. Hwa acupuncture: GV20, GV26, CV24, HT8, KI10, GB41, BL66, ST36, SP3, LR1, LI1, etc.	Improved
Kim[45] (2012)	n=1, F/46, 1) about 3 weeks 2) about 3 weeks	LR3, PC6, Gyunjung, Knee point (Seuljum), SP3, LI11	Improved
Kim[46] (2013)	n=1, F/38, about 30 days	1. LI4, LR3, GV20, Taeyang, 4 points around GV20 (Sasinchong), ST36 and abdominal area 2. Electroacupuncture: both ST36, ST37	1. Improved 2. Improved
Bae[47] (2014)	n=2 1. F/23, 21 days 2. F/39, 59 days	ST36, CV4, GB21, SP6, LI11, BL23, LR3	Improved
Lee[48] (2014)	n=1, M/31, 20 days	1. Baesu spots of Joktaeyang-bang-kyeong and ash points 2. Electroacupuncture	1. Improved 2. Improved
Jang[49] (2014)	n=1, F/47, 84 days	1. (1-62 days) GV16, GV14, SI11, GB21, BL23, GV, GB30 2. (1-62 days) Sa-am acupuncture: Stomach-tonification, Lung sedating acupuncture, Gall bladder-tonification, Samcho-tonification etc. 3. (63-84 days) Pyung-hyung acupuncture:nuchal pain(Gyungtong), shoulder pain(Gyungtong), low back pain(Yotong), gluteal pain(Duntong), knee pain (Seultong), wrist pain(Wantong), ankle pain(Gwatong), hemiplegia(Pyuntan)	1. Improved 2. Improved
Kim[50] (2015)	n=1, F/44 1) 21 days (ADM) 2) 32 days (OPD)	1.n.t. 2. Electroacupuncture	1. Improved 2. Improved
Lee[51] (2016)	n=1, F/42, 1) 18 days, 2) 17 days	1. GB21, SI15, BL41, SI11, BL23, BL24, BL25, GV3, GB30, GB29, BL56, BL57, KI6, BL62 2. Electroacupuncture: both BL23, GB21 3. Acupotomy: erector spinae	1. Improved 2. Improved 3. Improved

IV. MATERIALS AND METHODS

All patients were transferred from SAMY METYAS COVINA ARTHRITIS CLINIC. From July 2017 to August 2017, 20 patients who were diagnosed with Fibromyalgia (FM) by rheumatologist were treated with acupuncture. The range of age is from 20 to 65. All of participants were explained, they signed for informed consent form for protection. This form is attached in appendix A. The research project was approved by IRB (Institutional Review Boards) committee of South Baylo University. Participants were divided two groups to be Randomized controlled trial.

4.1 Research Design

Total research design is showing on Figure 2; Twenty (n=20) patients with the fibromyalgia were recruited and randomly allocated to 2 groups, the control group (CG) and the experimental group (EG). The CG was treated with traditional acupuncture, and the EG was put the needle with Sa-am acupuncture. Each group was treated for 8weeks. The treatment duration was 50 minutes each person with supine and prone positon. The evaluations were 2 times, which one was pre treatment, and the other was post treatment. All of evaluations were by Visual Analog Scale of Pain Measurement (VASPM) and Revised Fibromyalgia Impact Questionnaric (FIQR). These forms are attached in appendix B.

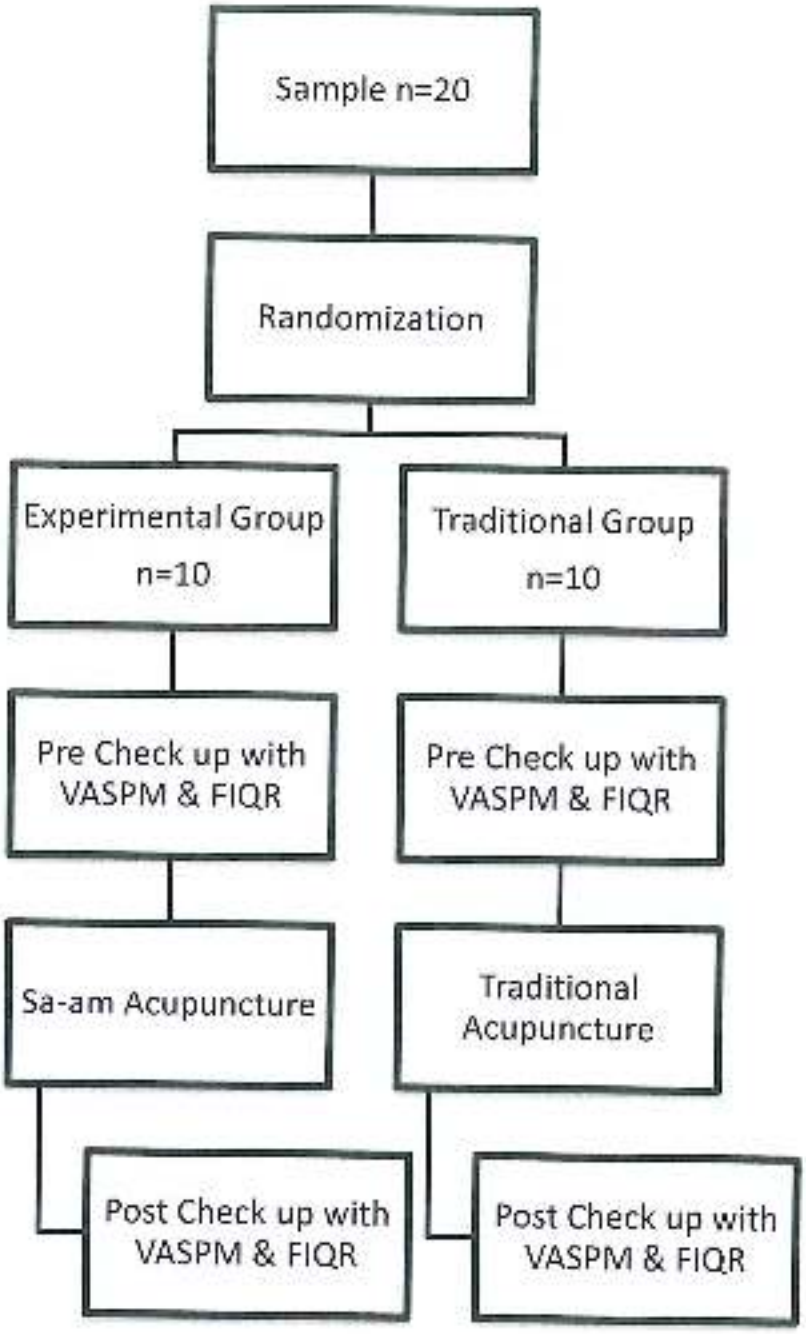

Figure 2. Schematic Diagram of Study Design

4.2 Research Participants

All participants were not treated by western medicine. General Characteristics, which were gender, age, and duration, of participants were showing below Table 3. Two groups of participants were female, and the age of patients was from 20's to 60's. Duration of the first time the patient has the diagnosis of Fibromyalgia was various from less than 10 years to 25 years.

Table 3. General Characteristics of Participants

Variable	Group	CG	EG
Gender	Male	0	0
	Female	10	10
Age	20's	0	0
	30's	1	1
	40's	3	5
	50's	4	4
	60's	2	0
Duration	< 5 years	0	0
	< 10 years	2	1
	< 20 years	2	4
	< 25 years	2	0

4.5 Study Procedures

4.5.1 Acupuncture Points

Table 4. Combinations of Acupuncture Points

	Combination of Acupuncture Points
Traditional Acupuncture Points	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10, LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
Sa-am Acupuncture Points	-Foot Shaoyang Gallbladder Channel (UB66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (Ren 12, UB60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05)

*Acupuncture points were selected based on symptoms for patients.

One group (Control Group) was treated by tradional acupuncture. The other (Experimental Group) was put by Sa-am acupuncture. Acupuncture points were selected based on symptoms for patients. These detail results are attached in appendix C. There are combinations of Acupuncture points on Table 4. Main symptoms of patients were multiple pain, sleeping disorder, fatigue, and low energy. In the traditional acupuncture, acupuncture points on the bladder meridian, kidney meridian, gallbladder, meridian,

small intestine meridian, governor vessel, conception vessel, stomach meridian, large intestine meridian, liver meridian, and extra points were used. In Sa-am acupuncture, acupuncture points of this research on the foot shaoyang gallbladder channel, the foot yangming stomach channel, the foot taiyang bladder channel, sanghwa special points, and blood stagnation releasing points were used. Acupuncture points were selected from the Chinese acupuncture and moxibustion[32], published journals[40)-51)] and Sa-am acupuncture treasure book.[29) 51)]

4.5.2 Needles

Stainless steel disposable needles (0.15 X 20 mm, 0.25 X 30 mm) were used for acupuncture treatment in this study. After using them, used needles would be disposed by the standard of waste materials in U.S.A.

4.6. Statistical Analysis

In this study, all data were evaluated using SPSS (Statistical Packages for Social Sciences) for window ver. 18.0. FIQR and VASPM were made before and after treatment. The results obtained are analyzed as follows: 1. for homogeneity, the data of pre-test FIQR and VASPM of two groups was analyzed by comparing; 2. for non-homonenetiy, the data of post-test FIQR and VASPM of two groups was analyzed by comparing; 3. for effectiveness, the difference of before and after FIQR and VASPM.of two groups was analyzed by comparing. In this study, sample size of two each group was n=10. For

significance of difference of mean of the independent sample, both of independent t-test as parametric test and Mann-Whitney U test as non-parametic test were used. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test would be used.

V. RESULTS AND DISCUSSION

The outcome measures were made by FIQR and VASPM. All raw FIQR and VASPM data are attached in appendix D. Statistical analysis program was used by SPSS for window (SPSS ver. 18.0). Each sample size (n=10) does not rely on parameter estimates about the distributions of variablies, so the data was analyzed by a non-parametric statistics test to compare 2 independent groups, 2 paired samples. Moreover, the data was analyed by Mann-Whitney test and Wilcoxon Signed-rank test with difference of pre experiments and post experiments. All statistical outputs are attached in appendix E.

5.1. Homogeneity Test for General Characteristics Participants

It was taken the statistical test for homogeneity for 3 general charactieristics participants about gender, age, and duration before treatment. The data was analyzed by Fisher's Exact Test and Person Chi-Squares. Results were on Table 5. Based on the below Table 5, all participants of this research were female. The age of participants was various from 20's to 60's. Duration of the first time the patient has the diagnosis of Fibromyagia was also various from 8 years to 25 years. The p-value of two groups about age and duration is greater than 0.05.

Table 5. Homogeneity Test for General Characteristics of Participants

Variable	Group	CG	EG	p-value
Gender	Male	0	0	-*
	Female	10	10	
Age	20's	0	0	0.699**
	30's	1	1	
	40's	3	5	
	50's	4	4	
	60's	2	0	
Duration	< 5 years	0	0	0.358**
	< 10 years	2	1	
	< 20 years	2	4	
	< 25 years	2	0	

* Fisher's Exact Test

**Person Chi-Squares

CG: Control Group with Traditional acupuncture

EG: Experimental Group with Sa-am acupuncture

5.2. The Comparison of the Data between two groups

5.2.1. The Comparison of two groups with total FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results for total FIQR are on the Table 6. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results for total FIQR are also in the Table 6. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for total FIQR is shown Figure 3. Specifical statistical results are attached in appendix E.

Table 6. The Mean and Statistical Data for total FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	122.8	109.9	0.848	0.045
Post TX	77.9	23.8	0.137	0.000
Difference	44.9	86.1	0.020	0.000
p-value*	0.000	0.000		
p-value**	0.005	0.005		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

Based on the above Table 6, the mean of the pre treatment of the control group was 122.8 and the mean of the pre treatment of the experimental group was 109.9. The mean

of the post treatment of the control group was 77.9 and the mean of the post treatment of the experimental group was 23.8. The difference of the mean of pre and post treatment of the CG was 44.9 and the difference of the mean of pre and post treatment of the EG was 86.1.

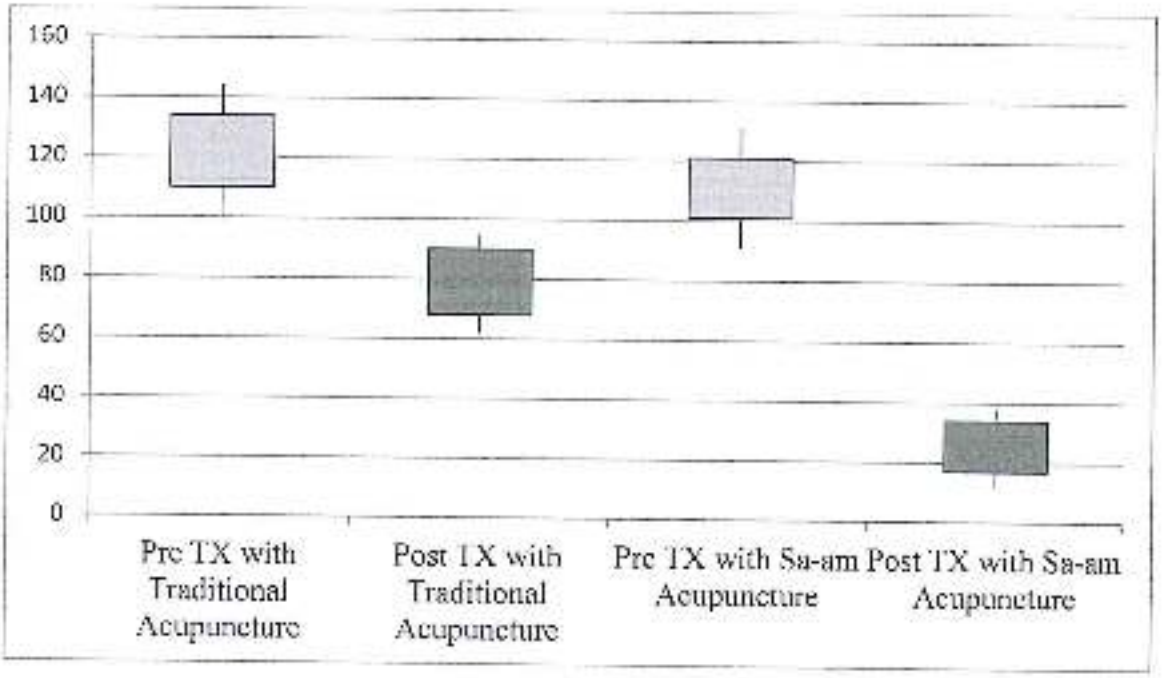

Figure 3. The Distribution Chart of Total FIQR of two groups

In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 6 [p (2-tailed) = $0.045 < 0.05$]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the

mean of post treatment of two groups. These results are in the Table 6. There was significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 6. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results, Sa-am acupuncture is about 2 times more effective than Tranditional acupuncture for overall treatment for Fibromyalgia.

5.2.2. The comparison of two groups with the function in FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with the function in FIQR are on the Table 7. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results with the function in FIQR are also in the Table 7. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for the function in FIQR is shown Figure 4. Specifical statistical results are attached in appendix E. Based on the below Table 7, the mean of the pre treatment of the control group was 51.5 and the mean of the pre treatment of the experimental group was 46.3. The mean of the post treatment of the control group was 32.1 and the mean of the post treatment of the experimental group was 7.6. The

difference of the mean of pre and post treatment of the CG was 19.4 and the difference of the mean of pre and post treatment of the EG was 38.7.

Table 7. The Mean and Statistical Data for the function in FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	51.5	46.3	0.047	0.088
Post TX	32.1	7.6	0.173	0.000
Difference	19.4	38.7	0.048	0.000
p-value*	0.000	0.000		
p-value**	0.005	0.005		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

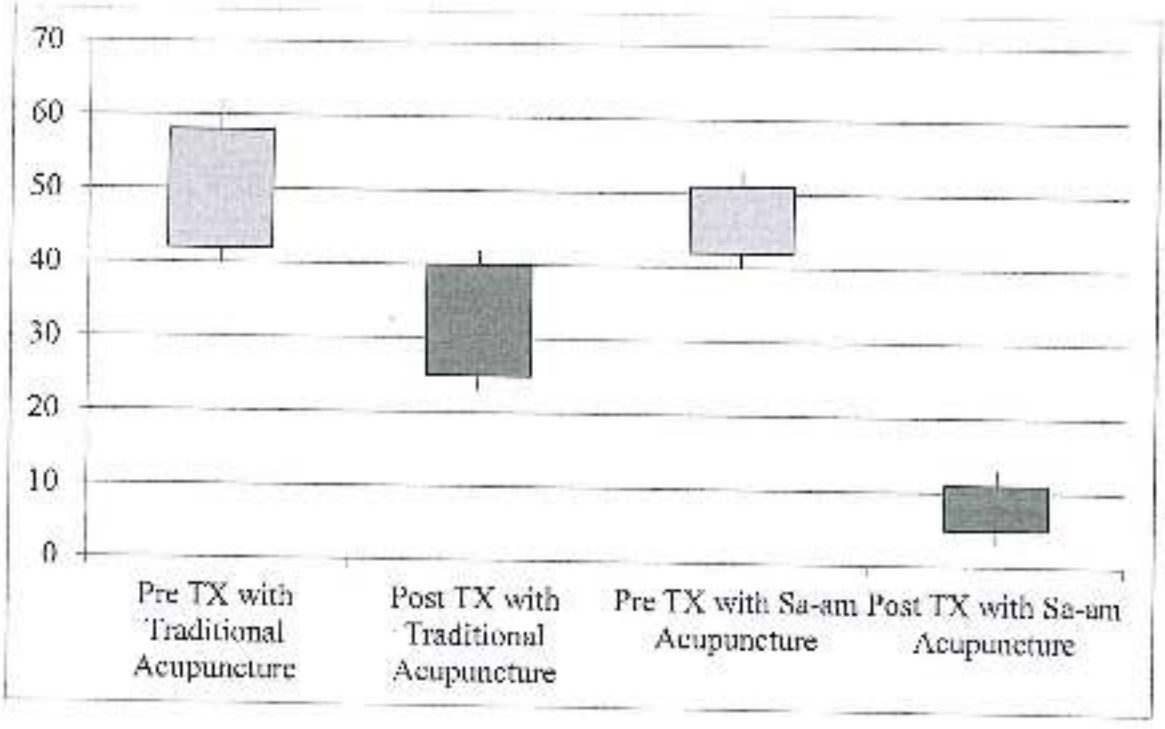

Figure 4. The Distribution Chart of the function in FIQR of two groups

In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 7 [p (2-tailed) = 0.088 > 0.05]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean of post treatment of two groups. These results are in the Table 7. There was significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 7. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results, Sa-am acupuncture is about 2 times more effective than Tranditional acupuncture for the function in FIQR.

5.2.3. The comparison of two groups with the overall impact in FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with the overall impact in FIQR are on the Table 8. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results with the overall impact in FIQR are also in the Table 8. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of

distribution of two groups for the overall impact in FIQR is shown Figure 5. Specifical statistical results are attached in appendix E. Based on the below Table 8, the mean of the pre treatment of the control group was 13.6 and the mean of the pre treatment of the experimental group was 11.4. The mean of the post treatment of the control group was 7.5 and the mean of the post treatment of the experimental group was 1.1. The difference of the mean of pre and post treatment of the CG was 6.1 and the difference of the mean of pre and post treatment of the EG was 10.3. In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.004$)].

Table 8. The Mean and Statistical Data for the overall impact in FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	13.6	11.4	0.083	0.036
Post TX	7.5	1.1	0.024	0.000
difference	6.1	10.3	0.374	0.000
p-value*	0.000	0.000		
p-value**	0.004	0.005		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 8 [p (2-tailed) = $0.036 < 0.05$]. Statistical outputs

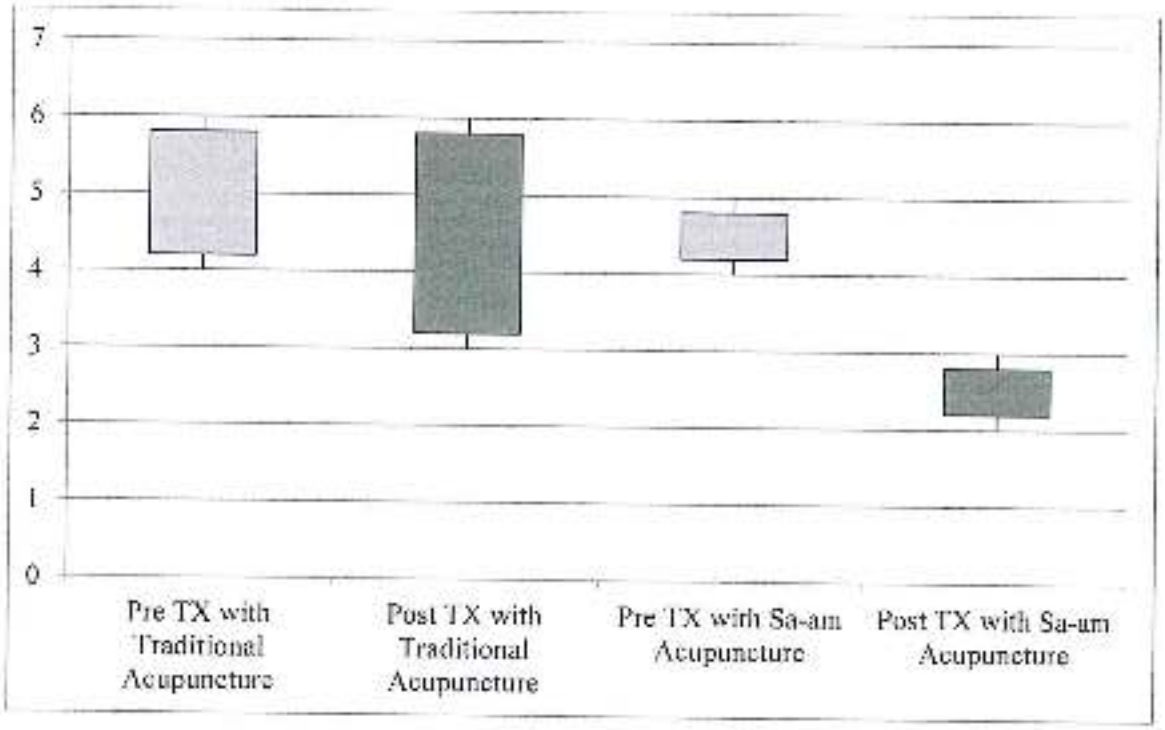

Figure 5. The Distribution Chart of Overall Impact of FIQR of two groups

are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean of post treatment of two groups. These results are in the Table 8. There was significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 8. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results, Sa-am acupuncture is about 1.7 times more effective than Tranditional acupuncture for the overall impact in FIQR.

5.2.4. The comparison of two groups with symptoms in FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with symptoms in FIQR are on the Table 9. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results with symptoms in FIQR are also in the Table 9. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for symptoms in FIQR is shown Figure 6. Specifical statistical results are attached in appendix E.

Table 9. The Mean and Statistical Data for symptoms in FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	57.7	52.2	0.597	0.128
Post TX	38.3	15.1	0.009	0.000
difference	19.4	37.1	0.218	0.000
p-value*	0.000	0.000		
p-value**	0.005	0.005		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

Based on the below Table 9, the mean of the pre treatment of the control group was 57.7 and the mean of the pre treatment of the experimental group was 52.2. The mean of the post treatment of the control group was 38.3 and the mean of the post treatment of the

experimental group was 15.1. The difference of the mean of pre and post treatment of the CG was 19.4 and the difference of the mean of pre and post treatment of the EG was 37.1. In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)].

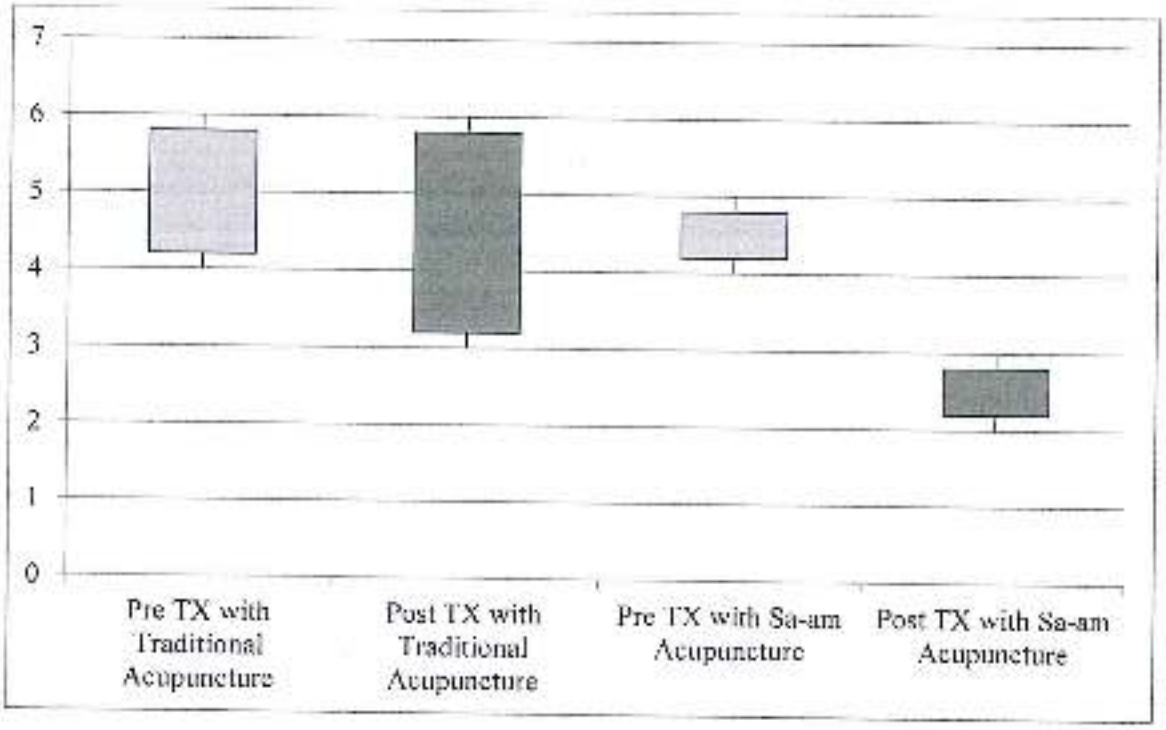

Figure 6. The Distribution Chart of Symptoms of FIQR of two groups

In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 9 [p (2-tailed) = 0.128 > 0.05]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean of post treatment of two groups. These results are in the Table 9. There was

significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 9. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results, Sa-am acupuncture is about 2.0 times more effective than Traditional acupuncture for symptoms in FIQR.

5.2.5. The comparison of two groups with pain in VASPM

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with pain in VASPM are on the Table 10. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used.

Table 10. The Mean and Statistical Data for Pain with VASPM

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	7.1	6.6	0.334	0.261
Post TX	3.9	1.8	0.511	0.001
difference	3.2	4.8	0.087	0.001
p-value*	0.000	0.000		
p-value**	0.004	0.003		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

These results with pain in VASPM are also in the Table 10. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for pain in VASPM is shown Figure 7. Specifical statistical results are attached in appendix E.

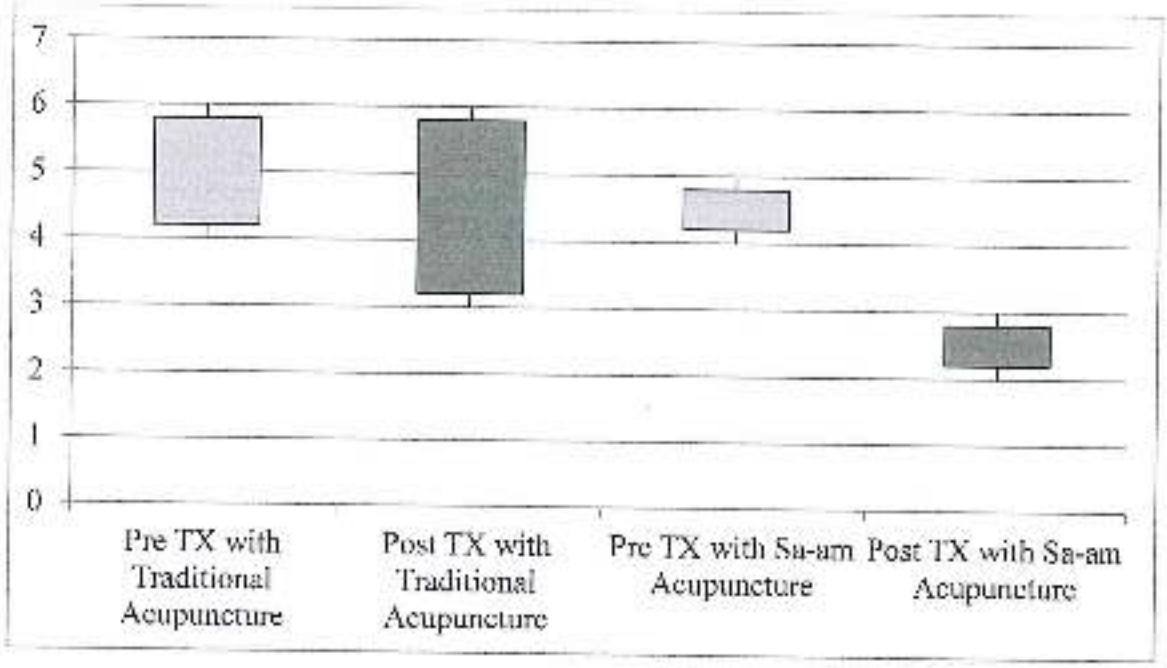

Figure 7. The Distribution Chart of VASPM of two groups

Based on the below Table 10, the mean of the pre treatment of the control group was 7.1 and the mean of the pre treatment of the experimental group was 6.6. The mean of the post treatment of the control group was 3.9 and the mean of the post treatment of the experimental group was 1.8. The difference of the mean of pre and post treatment of the CG was 3.2 and the difference of the mean of pre and post treatment of the EG was 4.8. In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.004$)]. In the

effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.003$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 10 [p (2-tailed) = 0.261 > 0.05]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean of post treatment of two groups. These results are in the Table 10. There was significant difference of two groups [p (2-tailed) = 0.001 < 0.005]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 10. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.001 < 0.005]. Based on above results, Sa-am acupuncture is about 1.5 times more effective than Tranditional acupuncture for pain in VASPM.

5.2.6. The comparison of two groups with sleep in FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with sleep in FIQR are on the Table 11. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results with sleep in FIQR are also in the Table 11. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for sleep in FIQR is shown Figure 8. Specifical statistical results are attached in appendix E.

Table 11. The Mean and Statistical Data for sleep in FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	7.1	6.3	0.000	0.426
Post TX	5.0	0.8	0.005	0.000
Difference	2.1	5.5	0.003	0.000
p-value*	0.000	0.000		
p-value**	0.004	0.005		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

Based on the below Table 11, the mean of the pre treatment of the control group was 7.1 and the mean of the pre treatment of the experimental group was 6.3. The mean of the post treatment of the control group was 5.0 and the mean of the post treatment of the experimental group was 0.8. The difference of the mean of pre and post treatment of the CG was 2.1 and the difference of the mean of pre and post treatment of the EG was 5.5. In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.004$)]. In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.005$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 11 [p (2-tailed) = 0.426 > 0.05]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean of post treatment of two groups.

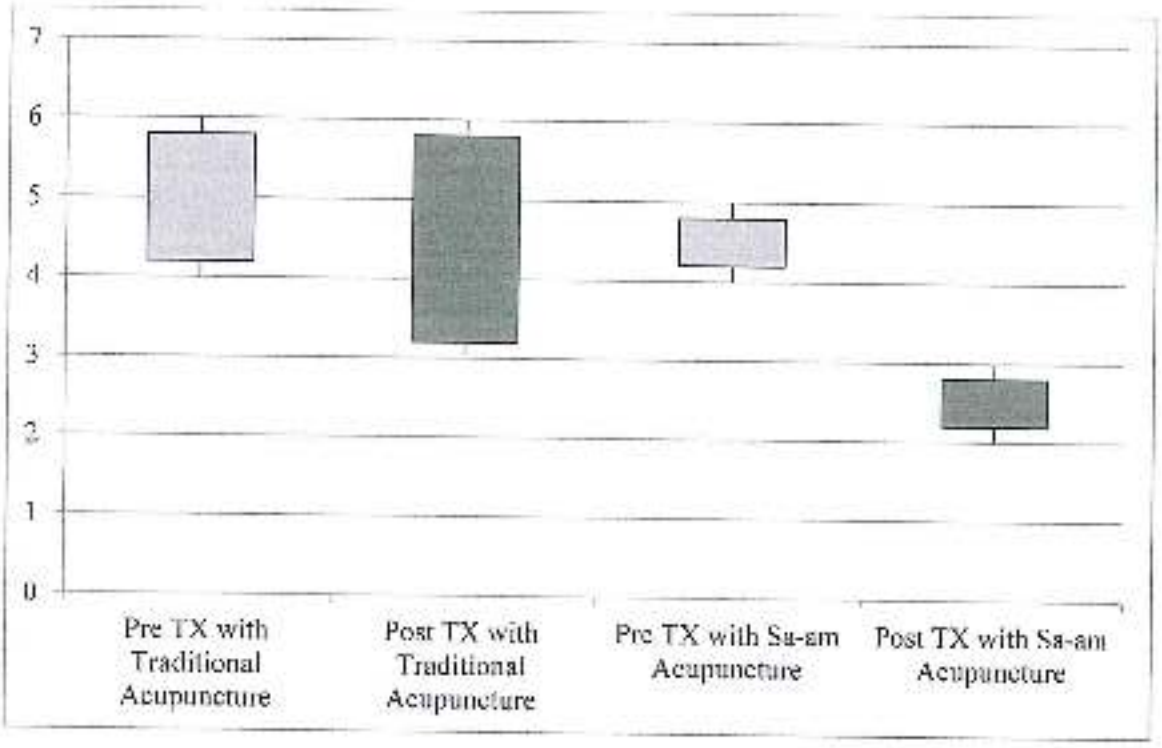

Figure 8. The Distribution Chart of Sleep of FIQR of two groups

These results are in the Table 11. There was significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 11. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results, Sa-am acupuncture is about 2.5 times more effective than Traditional acupuncture for sleep in FIQR.

5.2.7. The comparison of two groups with anxiety in FIQR

For the significance of the difference of mean of the independent sample, both of independent t-test as a parametric test and Mann-Whitney U test as a non-parametic test were used. Results with anxiety in FIQR are on the Table 12. For significance of difference of paired samples mean of before and after treatment, paired t-test as parametric test and Wilcoxon Signed-rank test were used. These results with anxiety in FIQR are also in the Table 12. The sample sizes are not large for the validity of normal distributions, so outputs of a non-parametric test were focused. The difference of distribution of two groups for anxiety in FIQR is shown Figure 9. Specifical statistical results are attached in appendix E.

Table 12. The Mean and Statistical Data for symptoms in FIQR

Tx Condition	Mean of Control Group(n=10)	Mean of Experimental Group(n=10)	p-value from the independent t test	p-value from Mann-Whitney U test
Pre TX	4.9	4.6	0.108	0.459
Post TX	4.6	2.3	0.006	0.000
Difference	0.3	2.3	0.653	0.000
p-value*	0.193	0.180		
p-value**	0.000	0.004		

*p-value by Paired t-test

**p-value by Wilcoxon Signed-rank test

Based on the below Table 12, the mean of the pre treatment of the control group was 4.9 and the mean of the pre treatment of the experimental group was 4.6. The mean of the

post treatment of the control group was 4.6 and the mean of the post treatment of the experimental group was 2.3. The difference of the mean of pre and post treatment of the CG was 0.3 and the difference of the mean of pre and post treatment of the EG was 2.3.

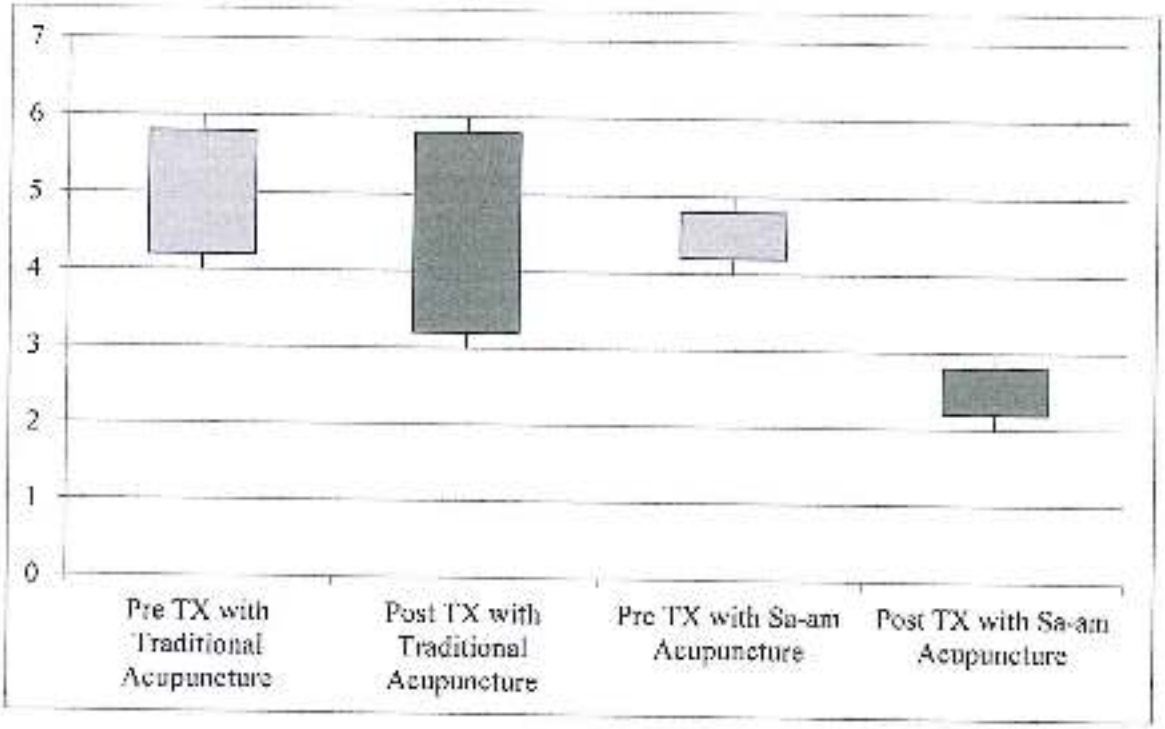

Figure 9. The Distribution Chart of Anxiety of FIQR of two groups

In the effectiveness of traditional acupuncture for the CG, there was significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.001$)]. In the effectiveness of Sa-am acupuncture for the EG, there was also significant difference between pre treatment and post treatment [Wilcoxon Signed-rank test ($p < 0.004$)]. In the equality of the mean of pre treatment of two groups, Mann-Whitney U test was used. These results are in the Table 12 [p (2-tailed) = 0.459 > 0.05]. Statistical outputs are attached in appendix E.4. Mann-Whitney U test was used for the comparison of the mean

of post treatment of two groups. These results are in the Table 12. There was significant difference of two groups [p (2-tailed) = 0.000 < 0.001]. In the effectiveness between Saam acupuncture and Traditional acupuncture, Mann-Whitney U test was used for the comparison of the difference of pre and post treatment. These results are in the Table 12. There was significant difference between pre and post treatment of two groups [p (2-tailed) = 0.000 < 0.001]. Based on above results. Sa-am acupuncture is about 8.0 times more effective than Tranditional acupuncture for anxiety in FIQR.

VI. CONCLUSION

The overall objective of this research is to evaluate the effectiveness of Sa-am (4-needling) acupuncture in the treatment of fibromyalgia. Patients (n=20) were randomly allocated to one of two treatment groups. One group received Sa-am acupuncture treatment and the other received Traditional acupuncture treatment. The outcome for these different groups was subsequently compared. Primary outcome measures were made based on results with Visual Analog Scale of Pain Measurement (VASPM) and Revised Fibromyalgia Impact Questionnaire (FIQR). Secondary outcomes were made analyzed by SPSS for window (SPSS ver. 18.0).

The obtained results are summarized as follows:

1. The reducing mean of total FIQR of the EG using Sa-am acupuncture was -86.1 and the reducing mean of total FIQR of the CG using traditional acupuncture was -44.9. Sa-am acupuncture is about 2 times more effective than Traditional acupuncture about total FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post treatments about total FIQR, we can assess the practical significance of two groups, in addition to statistical significance;

2. In the difference of the mean of total function of FIQR, the EG using Sa-am acupuncture was -38.7 and the CG using traditional acupuncture was -19.4. Sa-am acupuncture is about 2 times more effective than traditional acupuncture about total function of FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post treatments about total function of FIQR, we can assess the practical significance of two groups, in addition to statistical significance;

3. In the reduction of the mean of total overall impact FIQR, the EG using Sa-am acupuncture was -10.3 and the CG using traditional acupuncture was -6.1. Sa-am acupuncture is about 1.7 times more effective than traditional acupuncture about total function of FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post treatments about total overall impact of FIQR, we can assess the practical significance of two groups, in addition to statistical significance;

4. In the difference of the mean of total symptoms FIQR, the EG using Sa-am acupuncture was -37.1 and the CG using the traditional acupuncture technique was -19.4. Sa-am acupuncture is about 2 times more effective than traditional acupuncture about total symptoms of FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post treatments about total symptoms of FIQR, we can assess the practical significance of two groups, in addition to statistical significance;

5. In the reduction of the mean of total pain with VASPM, the EG using Sa-am acupuncture was -4.8 and the CG using the traditional acupuncture was -3.2. Sa-am acupuncture is about 1.5 times more effective than traditional acupuncture about total pain. When viewing the reduction of the distribution of the mean of two groups of pre and post treatments about total pain, we can assess the practical significance of two groups, in addition to statistical significance;

6. In the improvement of the mean of total sleep FIQR, the EG using Sa-am acupuncture was 5.5 and the CG using traditional acupuncture was 2.1. Sa-am acupuncture is about 2.6 times more effective than traditional acupuncture about total sleep of FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post

treatments about total sleep of FIQR, we can assess the practical significance of two groups, in addition to statistical significance;

7. In the improvement of the mean of total anxiety FIQR, the EG using Sa-am acupuncture was 2.3 and the CG using traditional acupuncture was 0.3. Sa-am acupuncture is about 8 times more effective than traditional acupuncture about total anxiety of FIQR. When viewing the difference of the distribution of the mean of two groups of pre and post treatments about total anxiety of FIQR, we can assess the practical significance of two groups, in addition to statistical significance.

In conclusion, the clinical evidence suggests that Sa-am (4-needle technique) acupuncture in managing Fibromyalgia is more effective than Traditional acupuncture.

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VII. APPENDICES

APPENDIX A.

INFORMED CONSENT FORM

TITLE OF STUDY

Clinical Study on the Treatment of Fibromyalgia using Sa-am (4-Needling) Acupuncture

PRINCIPAL INVESTIGATOR

RYU, JIN HYANG

ARTHRITIS DEPARTMENT

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PURPOSE OF STUDY

The goal of this research is to compare the treatment effects of Sa-am Acupuncture Technique and Traditional Acupuncture Technique in Fibromyalgia. This study would benefit to the clinical treatment plan.

STUDY PROCEDURES

For example, As traditional acupuncture points, we will use BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10,

LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03. As Sa-am acupuncture technique points, there will be used The Foot Shaoyang Gallbladder Channel (BL66, GB43, LI1, GB44), The Foot Yangming Stomach Channel (SI5, ST41, GB41, ST43), The Foot Taiyang Bladder Channel (LI1, BL67, S136, BI.40), Sanghwa Special Points (Ren 12, UB60, SJ05, KI10, LV08), Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05). There will be used disposable needles (0.15 X 20 mm, 0.25 X 30 mm Disposable stainless steel needle (Korea Medicine Acupuncture Needle, Korea). There will be treated each group for 8weeks. Each patient was treated for 50 minutes with supine and prone positon twice a week. The evaluations will be made based on results from treatments. All of results will be comparative study of which acupuncture treatment between Sa-am acupuncture and traditional acupuncture treatment is more effective with Visual Analog Scale of Pain Measurement (VASPM) and Revised Fibromyalgia Impact Questionnaire (FIQR). There will be used SPSS ver. 18.0 as statistical analysis program.

RISKS

Acupuncture is a generally safe method of treatment, but that it may have some side effects, including bruising, numbness or tingling near the needling sites that may last a few days, and dizziness or fainting. Unusual risks of acupuncture include spontaneous miscarriage, nerve damage and organ puncture, including lung puncture (pneumothorax). Infection is another possible risk, although the clinic uses sterile disposable needles and maintains a clean and safe environment.

BENEFITS

If you participate in this research, you will have the following benefits: it will be treated with affordable price ($25/visit). It will be treated by Jin Hyang Ryu L.Ac. There will be very few side effects. It will be very effective in controlling pain. It may be considered for patients who do not respond to pain medication.

CONFIDENTIALITY

The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except Ryu, Jin Hyang, L.Ac

CONTACT INFORMATION

If you have any questions about this study, please contact Ryu, Jin Hyang, L.Ac. at 562.458.8861 or 112rjh@hanmail.net. If you have any questions or concerns regarding your rights with respect to this research, you may contract Dr. Edwin Follick, the Chair of Institutional Review Board (IRB) at South Baylo University.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

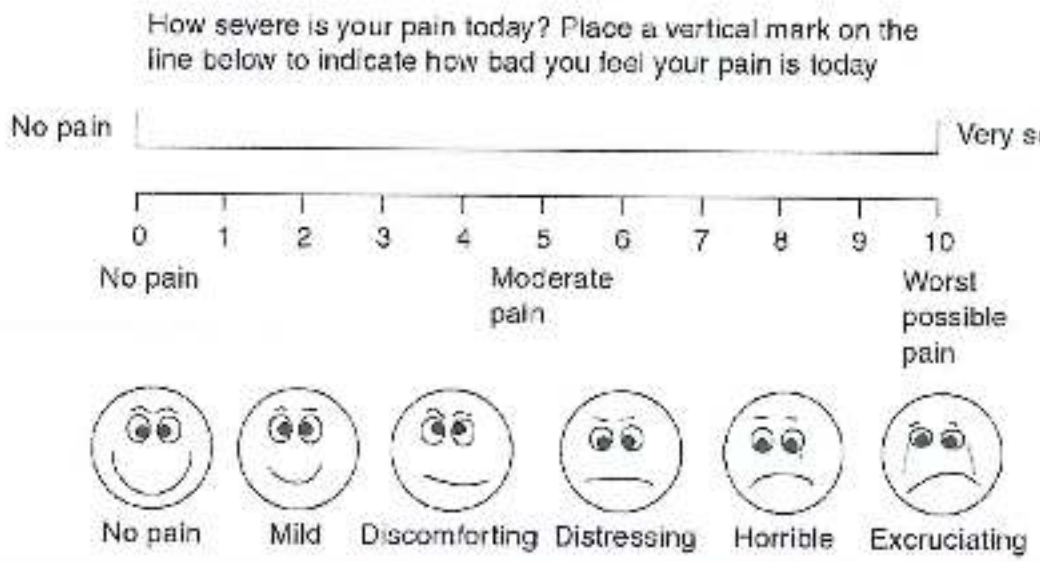
Participant's signature _____ Date _____

Investigator's signature _____ Date _____

APPENDIX B. Measurement Forms

APPENDIX B.1. Visual Analog Scale of Pain Measurement (VASPM)

Medscape



APPENDIX B.2.

REVISED FIBROMYALGIA IMPACT QUESTIONNAIRE (FIQR)

Last Name: **First Name:** **Age:**

Duration of FM symptoms (years) : **Time since FM was first diagnosed (years):**

Directions: For each of the following 9 questions check the box that best indicates how much your fibromyalgia made it difficult to perform each of the following activities during the past 7 days. If you did not perform a particular activity in the last 7 days, rate the difficulty for the last time you performed the activity. If you can't perform an activity, check the last box.

Brush or comb your hair	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Walk continuously for 20 minutes	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Prepare a homemade meal	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Vacuum, scrub or sweep floors	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Lift and carry a bag full of groceries	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Climb one flight of stairs	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Change bed sheets	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Sit in a chair for 45 minutes	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**
Go shopping for groceries	**No difficulty** ☐☐☐☐☐☐☐☐☐☐ **Very difficult**

Sub-total ***(for internal use only)*** ☐

Directions: For each of the following 2 questions, check the box that best describes the overall impact of your fibromyalgia over the last 7 days:

Fibromyalgia prevented me from accomplishing goals for the week	**Never** ☐☐☐☐☐☐☐☐☐☐ **Always**
I was completely overwhelmed by my fibromyalgia symptoms	**Never** ☐☐☐☐☐☐☐☐☐☐ **Always**

Sub-total ***(for internal use only)*** ☐

Directions: For each of the following 10 questions, select the box that best indicates your intensity of these common fibromyalgia symptoms over the past 7 days

Please rate your level of Pain	No pain	Unbearable pain
Please rate your level of Energy	Lots of energy	No energy
Please rate your level of Stiffness	No stiffness	Severe stiffness
Please rate the quality of your sleep	Awoke well rested	Awoke very tired
Please rate your level of Depression	No depression	Very depressed
Please rate your level of memory problems	Good memory	Very poor memory
Please rate your level of Anxiety	Not anxious	Very anxious
Please rate your level of tenderness to touch	No tenderness	Very tender
Please rate your level of balance problems	No imbalance	Severe imbalance
Please rate your level of sensitivity to loud noises, bright lights, odors and cold	No sensitivity	Extreme sensitivity

Sub-total *(for internal use only)* ☐

FIQR TOTAL *(for internal use only)* ☐

APPENDIX C. Combination of Acupuncture Points

APPENDIX C.1. Combination of Acupuncture Points for Control Group

No.	Patients' Main Symptoms	Acupuncture Points
1.	Low Back Pain, Shoulder Pain, Neck Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
2.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Arm Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10, LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
3.	Low Back Pain, Shoulder Pain, Neck Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
4.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
5.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Arm Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10, LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
6.	Low Back Pain, Neck Pain, Shoulder Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
7.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
8.	Low Back Pain, Shoulder Pain, Neck Pain , Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
9.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Arm Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10, LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03
10.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Arm Pain, Insomnia, Low Energy	BL23, BL24, BL25, BL40, BL57, BL60, KI03, GB20, GB21, GB30, GB41, SI11, SI15, ST35, ST36, GB34, LI10, LI11, DU20, Sishencong, Yintang, CV04, CV06, CV17, LI04, LV03

APPENDIX C.2. Combination of Acupuncture Points for Experimental Group

No.	Patients' Main Symptoms	Acupuncture Points
1.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
2.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
3.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
4.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
5.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).

APPENDIX C.2. Combination of Acupuncture Points for Experimental Group

No.	Patients' Main Symptoms	Acupuncture Points
6.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
7.	Low Back Pain, Shoulder Pain, Neck Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
8.	Low Back Pain, Shoulder Pain, Neck Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
9.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).
10.	Low Back Pain, Shoulder Pain, Neck Pain, Knee Pain, Insomnia, Low Energy	-Foot Shaoyang Gallbladder Channel (BL66, GB43, LI01, GB44), -The Foot Yangming Stomach Channel (SI05, ST41, GB41, ST43), -The Foot Taiyang Bladder Channel (LI01, BL67, ST36, BL40), -Sanghwa Special Points (CV12, BL60, SJ05, KI10, LV08), -Blood Stagnation Releasing Points (LU09, SP03, LI11, SJ05).

APPENDIX D. Raw FIQR Data

APPENDIX D.1. Pre FIQR Score for CG

	1	2	3	4	5	6	7	8	9	10	Mean
Gender	W	W	W	W	W	W	W	W	W	W	
Age	53	63	45	58	64	43	45	38	56	56	52.1
How long	15	25	17	18	25	15	8	9	12	15	15.9
Function											
Brush or comb your hair	5	6	5	7	8	5	6	5	7	7	6.1
Walk continuously for 20 minutes	7	7	8	6	8	6	6	6	7	8	6.9
Prepare a homemade meal	5	6	6	7	6	4	4	4	6	4	5.2
Vacuum, scrub or sweep floors	6	5	6	6	6	4	4	4	6	4	5.1
Lift and carry a bag full of groceries	5	6	6	7	6	4	4	4	6	4	5.2
Climb one flight of stairs	6	7	6	5	6	4	4	4	6	4	5.2
Change bed sheets	7	6	6	6	6	4	4	4	6	4	5.3
Sit in a chair for 45 minutes	6	7	6	7	8	7	6	5	7	8	6.7
Go shopping for groceries	6	6	6	7	8	7	4	4	6	4	5.8
Sub total	53	56	55	58	62	45	42	40	57	47	51.5
Overall Impact											
Fibromyalgia prevented me from accomplishing goals for the week	7	7	8	6	8	6	6	6	7	7	6.8
I was completely overwhelmed by my fibromyalgia symptoms	7	7	8	6	8	6	6	6	7	7	6.8
Sub total	14	14	16	12	16	12	12	12	14	14	13.6
Symptoms											
Please rate your level of pain (VASPM)	8	7	7	8	8	6	6	6	8	7	7.1
Please rate your level of energy	7	6	7	7	7	6	6	5	7	7	6.5
Please rate your level of stiffness	8	7	7	8	8	6	6	6	8	7	7.1
Please rate the quality of your sleep	7	7	7	8	7	7	7	7	7	7	7.1
Please rate your level of depression	7	6	7	7	7	5	5	5	7	6	6.2
Please rate your level of memory problems	5	5	5	6	6	4	4	4	6	4	4.9
Please rate your level of anxiety	5	5	5	6	6	4	4	4	6	4	4.9
Please rate your level of tenderness to touch	8	7	7	8	8	6	6	6	8	7	7.1
Please rate your level of balance problems	5	5	5	4	5	4	3	3	4	4	4.2
Please rate your level of sensitivity to loud noises, bright lights, odors and cold	3	3	3	3	4	2	2	1	3	2	2.6
Sub total	63	58	60	65	66	50	49	47	64	55	57.7
Total	130	128	131	135	144	107	103	99	135	116	123

APPENDIX D.2. Pre FIQR Score for EG

	1	2	3	4	5	6	7	8	9	10	Mean
Gender	W	W	W	W	W	W	W	W	W	W	
Age	53	45	56	45	56	56	46	38	42	45	48.2
How long	14	15	16	17	18	20	13	8	13	14	14.8
Function											
Brush or comb your hair	7	8	6	5	4	6	5	4	6	6	5.7
Walk continuously for 20 minutes	7	8	8	8	7	8	7	7	7	7	7.4
Prepare a homemade meal	4	5	6	5	5	4	5	4	4	4	4.6
Vacuum, scrub or sweep floors	5	4	6	5	4	4	4	4	5	5	4.6
Lift and carry a bag full of groceries	4	4	5	6	4	4	5	4	5	5	4.6
Climb one flight of stairs	5	4	5	6	4	4	4	4	5	4	4.5
Change bed sheets	4	5	5	5	4	4	5	4	4	5	4.5
Sit in a chair for 45 minutes	8	8	7	7	5	5	6	5	5	5	6.1
Go shopping for groceries	4	5	5	5	4	4	4	4	4	4	4.3
Sub total	48	51	53	52	41	43	45	40	45	45	46.3
Overall Impact											
Fibromyalgia prevented me from accomplishing goals for the week	6	7	7	8	5	5	5	5	5	5	5.8
I was completely overwhelmed by my fibromyalgia symptoms	6	7	7	8	5	5	5	5	4	4	5.6
Sub total	12	14	14	16	10	10	10	10	9	9	11.4
Symptoms											
Please rate your level of pain (VASPM)	7	8	8	8	6	6	6	5	6	6	6.6
Please rate your level of energy	7	7	7	7	5	5	5	4	5	5	5.7
Please rate your level of stiffness	7	8	8	8	6	6	6	5	5	5	6.4
Please rate the quality of your sleep	7	7	8	8	7	7	7	4	4	4	6.3
Please rate your level of depression	6	7	7	7	5	5	5	5	5	5	5.7
Please rate your level of memory problems	4	5	5	5	4	4	4	4	4	4	4.3
Please rate your level of anxiety	4	5	5	5	5	5	5	4	4	4	4.6
Please rate your level of tenderness to touch	7	8	8	8	6	6	6	5	5	5	6.4
Please rate your level of balance problems	4	5	5	5	4	4	4	3	4	4	4.2
Please rate your level of sensitivity to loud noises, bright lights, odors and cold	2	2	2	2	2	2	2	2	2	2	2
Sub total	55	62	63	63	50	50	50	41	44	44	52.2
Total	115	127	130	131	101	103	105	91	98	98	110

APPENDIX D.3. Post FIQR Score for CG

	1	2	3	4	5	6	7	8	9	10	Mean
Gender	W	W	W	W	W	W	W	W	W	W	
Age	53	63	45	58	64	43	45	38	56	56	52.1
How long	15	25	17	18	25	15	8	9	12	15	15.9
Function											
Brush or comb your hair	3	3	3	4	4	3	3	3	4	4	3.4
Walk continuously for 20 minutes	4	4	5	3	4	3	3	3	4	3	3.6
Prepare a homemade meal	3	3	3	4	3	2	3	3	3	2	2.9
Vacuum, scrub or sweep floors	3	4	4	5	4	3	3	3	4	3	3.6
Lift and carry a bag full of groceries	2	4	4	5	5	3	3	2	4	3	3.5
Climb one flight of stairs	3	3	4	4	4	3	3	2	4	3	3.3
Change bed sheets	3	3	4	5	5	3	3	2	4	3	3.5
Sit in a chair for 45 minutes	3	4	5	4	7	5	4	3	5	6	4.6
Go shopping for groceries	3	3	4	4	6	5	3	2	4	3	3.7
Sub total	27	31	36	38	42	30	28	23	36	30	32.1
Overall Impact											
Fibromyalgia prevented me from accomplishing goals for the week	4	4	4	3	4	4	4	4	5	5	4.1
I was completely overwhelmed by my fibromyalgia symptoms	3	3	3	3	5	3	3	3	4	4	3.4
Sub total	7	7	7	6	9	7	7	7	9	9	7.5
Symptoms											
Please rate your level of pain (VASPM)	5	5	3	3	4	3	3	3	5	5	3.9
Please rate your level of energy	5	5	4	4	5	4	4	3	5	5	4.4
Please rate your level of stiffness	5	4	3	4	5	4	4	4	5	5	4.3
Please rate the quality of your sleep	4	4	6	6	5	5	5	5	5	5	5
Please rate your level of depression	4	4	4	4	4	3	3	3	4	4	3.7
Please rate your level of memory problems	3	4	3	4	4	3	3	3	4	3	3.4
Please rate your level of anxiety	3	4	5	6	6	4	4	4	6	4	4.6
Please rate your level of tenderness to touch	4	4	2	2	3	3	3	3	3	3	3
Please rate your level of balance problems	3	4	5	4	5	4	3	3	4	4	3.9
Please rate your level of sensitivity to loud noises, bright lights, odors and cold	2	2	2	2	3	2	2	1	3	2	2.1
Sub total	38	40	37	39	44	35	34	32	44	40	38.3
Total	72	78	80	83	95	72	69	62	89	79	77.9

APPENDIX D.4. Post FIQR Score for EG

	1	2	3	4	5	6	7	8	9	10	Mean
Gender	W	W	W	W	W	W	W	W	W	W	
Age	53	45	56	45	56	56	46	38	42	45	48.2
How long	14	15	16	17	18	20	13	8	13	14	14.8
Function											
Brush or comb your hair	2	2	2	1	1	2	2	1	2	2	1.7
Walk continuously for 20 minutes	2	1	2	0	2	1	1	0	1	1	1.1
Prepare a homemade meal	1	2	1	2	1	1	1	1	1	1	1.2
Vacuum, scrub or sweep floors	1	1	1	2	0	0	0	0	0	0	0.5
Lift and carry a bag full of groceries	1	1	1	2	0	0	0	0	0	0	0.5
Climb one flight of stairs	1	1	1	2	0	0	0	0	0	0	0.5
Change bed sheets	1	1	1	1	0	0	0	0	0	0	0.4
Sit in a chair for 45 minutes	1	2	2	2	1	1	1	1	1	1	1.3
Go shopping for groceries	1	1	1	1	0	0	0	0	0	0	0.4
Sub total	11	12	12	13	5	5	5	3	5	5	7.6
Overall Impact											
Fibromyalgia prevented me from accomplishing goals for the week	1	2	2	2	0	0	0	0	0	0	0.7
I was completely overwhelmed by my fibromyalgia symptoms	1	1	1	1	0	0	0	0	0	0	0.4
Sub total	2	3	3	3	0	0	0	0	0	0	1.1
Symptoms											
Please rate your level of pain (VASPM)	2	3	3	3	1	2	1	1	1	1	1.8
Please rate your level of energy	3	3	3	3	2	2	2	1	2	2	2.3
Please rate your level of stiffness	2	3	3	3	1	2	1	1	1	1	1.8
Please rate the quality of your sleep	2	2	2	2	0	0	0	0	0	0	0.8
Please rate your level of depression	2	2	2	2	0	0	0	0	0	0	0.8
Please rate your level of memory problems	3	2	2	2	2	2	2	2	2	2	2.1
Please rate your level of anxiety	3	3	3	2	2	2	2	2	2	2	2.3
Please rate your level of tenderness to touch	2	3	3	3	1	2	1	1	1	1	1.8
Please rate your level of balance problems	1	1	1	1	0	0	0	0	0	0	0.4
Please rate your level of sensitivity to loud noises, bright lights, odors and cold	1	1	1	1	1	1	1	1	1	1	1
Sub total	21	23	23	22	10	13	10	9	10	10	15.1
Total	34	38	38	38	15	18	15	12	15	15	23.8

APPENDIX E. Statistical Analysis

APPENDIX E.1. Paired Sample test

APPENDIX E.1.1. Paired Samples Statistics

	Group	Mean	N	Std. Deviation	Std. Error Mean
Total of CG	Pre TX	122.8	10	15.44740	4.88490
	Post TX	77.9	10	9.71196	3.07119
Total of EG	Pre TX	109.9	10	14.75315	4.66536
	Post TX	23.8	10	11.50652	3.63868
Function of CG	Pre TX	51.5	10	7.47217	2.36291
	Post TX	32.1	10	5.76291	1.82239
Function of EG	Pre TX	46.3	10	4.54728	1.43798
	Post TX	7.6	10	3.86437	1.22202
Overall Impact of CG	Pre TX	13.6000	10	1.57762	.49889
	Post TX	7.5000	10	1.08012	.34157
Overall Impact of EG	Pre TX	11.4000	10	2.45855	.77746
	Post TX	1.1000	10	1.44914	.45826
Symptoms of CG	Pre TX	57.7000	10	7.08755	2.24128
	Post TX	38.3000	10	3.97352	1.25654
Symptoms of EG	Pre TX	52.2000	10	8.24352	2.60683
	Post TX	15.1000	10	6.26188	1.98018
Pain of CG	Pre TX	7.1000	10	.87560	.27689
	Post TX	3.9000	10	.99443	.31447
Pain of EG	Pre TX	6.6000	10	1.07497	.33993
	Post TX	1.8000	10	.91894	.29059
Sleep of CG	Pre TX	7.1000	10	.31623	.10000
	Post TX	5.0000	10	.66667	.21082
Sleep of EG	Pre TX	6.3000	10	1.63639	.51747
	Post TX	.8000	10	1.03280	.32660

APPENDIX E.1.1. Paired Samples Statistics

	Group	Mean	N	Std. Deviation	Std. Error Mean
Anxiety of CG	Pre TX	4.9000	10	.87560	.27689
	Post TX	4.6000	10	1.07497	.33993
Anxiety of EG	Pre TX	4.6000	10	.51640	.16330
	Post TX	2.3000	10	.48305	.15275

APPENDIX E.1.2. Paired Samples Correlations

Group		N	Correlation	Sig.
Total of CG	Pre TX & Post TX	10	.871	.001
Total of EG	Pre TX & Post TX	10	.965	.000
Function of CG	Pre TX & Post TX	10	.855	.002
Function of EG	Pre TX & Post TX	10	.937	.000
Overall Impact of CG	Pre TX & Post TX	10	.522	.122
Overall Impact of EG	Pre TX & Post TX	10	.954	.000
Symptoms of CG	Pre TX & Post TX	10	.828	.003
Symptoms of EG	Pre TX & Post TX	10	.932	.000
Pain of CG	Pre TX & Post TX	10	.523	.121
Pain of EG	Pre TX & Post TX	10	.922	.000
Sleep of CG	Pre TX & Post TX	10	.527	.117
Sleep of EG	Pre TX & Post TX	10	.631	.050
Anxiety of CG	Pre TX & Post TX	10	.779	.008
Anxiety of EG	Pre TX & Post TX	10	.089	.807

APPENDIX E.1.3. Paired Samples Test

	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Total CG Pre TX – Post TX	44.9	8.46496	2.67686	38.84453	50.95547	16.773	9	.000
Total EG Pre TX – Post TX	86.1	4.74810	1.50148	82.70341	89.49659	57.343	9	.000
Function CG Pre TX – Post TX	19.4	3.92145	1.24007	16.59476	22.20524	15.644	9	.000
Function EG Pre TX – Post TX	38.7	1.63639	.51747	37.52940	39.87060	74.787	9	.000
Overall Impact CG Pre TX – Post TX	6.1	1.37032	.43333	5.11973	7.08027	14.077	9	.000
Overall Impact EG Pre TX – Post TX	10.3	1.15950	.36667	9.47054	11.12946	28.091	9	.000
Symptoms CG Pre TX – Post TX	19.4	4.40202	1.39204	16.25098	22.54902	13.936	9	.000
Symptoms EG Pre TX – Post TX	37.1	3.31495	1.04828	34.72863	39.47137	35.391	9	.000
Pain CG Pre TX – Post TX	3.2	.91894	.29059	2.54263	3.85737	11.012	9	.000
Pain EG Pre TX – Post TX	4.8	.42164	.13333	4.49838	5.10162	36.000	9	.000
Sleep CG Pre TX – Post TX	2.1	.56765	.17951	1.69393	2.50607	11.699	9	.000
Sleep EG Pre TX – Post TX	5.5	1.26930	.40139	4.59200	6.40800	13.703	9	.000
Anxiety CG Pre TX – Post TX	.300	.67495	.21344	-.18283	.78283	1.406	9	.193
Anxiety EG Pre TX – Post TX	2.30	.67495	.21344	1.81717	2.78283	10.776	9	.000

APPENDIX E.2. Wilcoxon Signed Ranks Test

APPENDIX E.2.1. Ranks of Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Total CG Post TX – Pre TX	Negative Ranks	10[a]	5.50	55.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	10		
Total EG Post TX – Pre TX	Negative Ranks	10[d]	5.50	55.00
	Positive Ranks	0[e]	.00	.00
	Ties	0[f]		
	Total	10		
Function CG Post TX – Pre TX	Negative Ranks	10[g]	5.50	55.00
	Positive Ranks	0[h]	.00	.00
	Ties	0[i]		
	Total	10		
Function EG Post TX – Pre TX	Negative Ranks	10[j]	5.50	55.00
	Positive Ranks	0[k]	.00	.00
	Ties	0[l]		
	Total	10		
Overall Impact CG Post TX – Pre TX	Negative Ranks	10[m]	5.50	55.00
	Positive Ranks	0[n]	.00	.00
	Ties	0[o]		
	Total	10		
Overall Impact EG Post TX – Pre TX	Negative Ranks	10[p]	5.50	55.00
	Positive Ranks	0[q]	.00	.00
	Ties	0[r]		
	Total	10		

APPENDIX E.2.1. Ranks of Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Symptoms CG Post TX – Pre TX	Negative Ranks	10[a]	5.50	55.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	10		
Symptoms EG Post TX – Pre TX	Negative Ranks	10[d]	5.50	55.00
	Positive Ranks	0[e]	.00	.00
	Ties	0[f]		
	Total	10		
Pain CG Post TX – Pre TX	Negative Ranks	10[g]	5.50	55.00
	Positive Ranks	0[h]	.00	.00
	Ties	0[i]		
	Total	10		
Pain EG Post TX – Pre TX	Negative Ranks	10[j]	5.50	55.00
	Positive Ranks	0[k]	.00	.00
	Ties	0[l]		
	Total	10		
Sleep CG Post TX – Pre TX	Negative Ranks	10[m]	5.50	55.00
	Positive Ranks	0[n]	.00	.00
	Ties	0[o]		
	Total	10		
Sleep EG Post TX – Pre TX	Negative Ranks	10[p]	5.50	55.00
	Positive Ranks	0[q]	.00	.00
	Ties	0[r]		
	Total	10		

APPENDIX E.2.1. Ranks of Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Anxiety CG Post TX – Pre TX	Negative Ranks	10[a]	1.50	3.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	10		
Anxiety EG Post TX – Pre TX	Negative Ranks	10[d]	5.50	55.00
	Positive Ranks	0[e]	.00	.00
	Ties	0[f]		
	Total	10		

APPENDIX E.2.2. Test Statistics[h] of Wilcoxon Signed Ranks Test

		Post TX – Pre TX
Total CG	Z	-2.805[g]
	Asymp. Sig. (2-tailed)	.005
Total EG	Z	-2.805[g]
	Asymp. Sig. (2-tailed)	.005
Function CG	Z	-2.807[g]
	Asymp. Sig. (2-tailed)	.005
Function EG	Z	-2.814[g]
	Asymp. Sig. (2-tailed)	.005
Overall Impact CG	Z	-2.848[g]
	Asymp. Sig. (2-tailed)	.004
Overall Impact EG	Z	-2.844[g]
	Asymp. Sig. (2-tailed)	.004
Symptoms CG	Z	-2.821[g]
	Asymp. Sig. (2-tailed)	.005
Symptoms EG	Z	-2.818[g]
	Asymp. Sig. (2-tailed)	.005

APPENDIX E.2.2. Test Statistics[b] of Wilcoxon Signed Ranks Test

		Post TX – Pre TX
Pain CG	Z	-2.844[a]
	Asymp. Sig. (2-tailed)	.004
Pain EG	Z	-2.972[a]
	Asymp. Sig. (2-tailed)	.003
Sleep CG	Z	-2.913[a]
	Asymp. Sig. (2-tailed)	.004
Sleep EG	Z	-2.821[a]
	Asymp. Sig. (2-tailed)	.004
Anxiety CG	Z	-1.342[a]
	Asymp. Sig. (2-tailed)	.180
Anxiety EG	Z	-2.859[a]
	Asymp. Sig. (2-tailed)	.004

a. Based on positive ranks.
b. Wilcoxon Signed Ranks Test

APPENDIX E.3. T-test

APPENDIX E.3.1. Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pre total FIQR	1.00	10	122.8000	15.44740	4.88490
	2.00	10	109.9000	14.75315	4.66536
Post total FIQR	1.00	10	77.9000	9.71196	3.07119
	2.00	10	23.8000	11.50652	3.63868
difference of total FIQR	1.00	10	44.9000	8.4650	2.6769
	2.00	10	86.1000	4.7481	1.5015
Pre Function FIQR	1.00	10	51.5000	7.47217	2.36291
	2.00	10	46.3000	4.54728	1.43798

APPENDIX E.3.1. Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Post Function FIQR	1.00	10	32.1000	5.76291	1.82239
	2.00	10	7.8000	3.64539	1.15277
difference of Function FIQR	1.00	10	19.400	3.9215	1.2401
	2.00	10	38.700	1.6364	.5175
Pre Overall Impact FIQR	1.00	10	13.6000	1.57762	.49889
	2.00	10	11.4000	2.45855	.77746
Post Overall Impact FIQR	1.00	10	7.5000	1.08012	.34157
	2.00	10	1.6000	1.83787	.58119
difference of Overall Impact FIQR	1.00	10	6.100	1.3703	.4333
	2.00	10	10.300	1.1595	.3667
Pre Symptoms FIQR	1.00	10	57.7000	7.08755	2.24128
	2.00	10	52.2000	8.24352	2.60683
Post Symptoms FIQR	1.00	10	38.3000	3.97352	1.25654
	2.00	10	15.1000	6.26188	1.98018
difference of Symptoms FIQR	1.00	10	19.400	4.4020	1.3920
	2.00	10	37.100	3.3149	1.0483
Pre Pain with VASPM	1.00	10	7.1000	.87560	.27689
	2.00	10	6.6000	1.07497	.33993
Post Pain with VASPM	1.00	10	3.9000	.99443	.31447
	2.00	10	1.8000	.91894	.29059
difference of Pain with VASPM	1.00	10	3.200	.9189	.2906
	2.00	10	4.800	.4216	.1333
Pre Sleep FIQR	1.00	10	7.1000	.31623	.10000
	2.00	10	6.3000	1.63639	.51747

APPENDIX E.3.1. Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Post Sleep FIQR	1.00	10	5.0000	.66667	.21082
	2.00	10	.8000	1.03280	.32660
difference of Sleep FIQR	1.00	10	2.100	.5676	.1795
	2.00	10	5.500	1.2693	.4014
Pre Anxiety FIQR	1.00	10	4.9000	.87560	.27689
	2.00	10	4.6000	.51640	.16330
Post Anxiety FIQR	1.00	10	4.6000	1.07497	.33993
	2.00	10	2.3000	.48305	.15275
difference of Anxiety FIQR	1.00	10	.300	.6749	.2134
	2.00	10	2.3000	.6749	.2134

APPENDIX E.3.2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	DF	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Pre Total FIQR	Equal variances assumed	.038	0.848	1.91	18	.072	12.9	6.75483	-1.29138	27.09138
	Equal variances not assumed			1.91	17.962	.072	12.9	6.75483	-1.29353	27.09353
Post Total FIQR	Equal variances assumed	2.425	0.139	11.362	18	.000	54.10	4.76154	44.09538	64.10462
	Equal variances not assumed			11.362	13.506	.000	54.10	4.76154	44.07612	64.12388
difference of total FIQR	Equal variances assumed	6.272	0.020	-13.424	18	.000	-41.20000	3.0692	-47.6482	-34.7518
	Equal variances not assumed			-13.424	14.155	.000	-41.20000	3.0692	-47.7761	-34.6239
Pre Function FIQR	Equal variances assumed	4.558	.047	1.880	18	.076	5.20000	2.76606	-.61129	11.01129
	Equal variances not assumed			1.880	14.862	.080	5.20000	2.76606	-.70049	11.10049
Post Function FIQR	Equal variances assumed	2.010	.173	11.269	18	.000	24.30000	2.15639	19.76960	28.83040
	Equal variances not assumed			11.269	15.208	.000	24.30000	2.15639	19.70925	28.89075
difference of Function FIQR	Equal variances assumed	4.482	.048	-14.363	18	.000	-19.3000	1.3437	-22.1230	-16.4770
	Equal variances not assumed			-14.363	12.047	.000	-19.3000	1.3437	-22.2266	-16.3734

APPENDIX E.3.2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Pre Overall Impact FIQR	Equal variances assumed	5.358	0.033	2.382	18	.028	2.20000	.92376	.25925	4.14075
	Equal variances not assumed			2.382	15.337	.031	2.20000	.92376	.23482	4.16518
Post Overall Impact FIQR	Equal variances assumed	6.125	0.024	8.752	18	.000	5.90000	.67412	4.48372	7.31628
	Equal variances not assumed			8.752	14.554	.000	5.90000	.67412	4.45930	7.34070
difference of Overall Impact FIQR	Equal variances assumed	.832	.372	-7.399	18	.000	-4.2000	.5676	-5.3926	-3.0074
	Equal variances not assumed			-7.399	17.520	.000	-4.2000	.5676	-5.3949	-3.0051
Pre Symptoms FIQR	Equal variances assumed	.290	.597	1.600	18	.127	5.50000	3.43786	-1.72268	12.72268
	Equal variances not assumed			1.600	17.600	.127	5.50000	3.43786	-1.73434	12.73434
Post Symptoms FIQR	Equal variances assumed	8.614	.009	9.893	18	.000	23.20000	2.34521	18.27290	28.12710
	Equal variances not assumed			9.893	15.237	.000	23.20000	2.34521	18.20806	28.19194
difference of Symptoms FIQR	Equal variances assumed	1.627	.218	-10.157	18	.000	-17.70000	1.7426	-21.3611	-14.0389
	Equal variances not assumed			-10.157	16.724	.000	-17.70000	1.7426	-21.3812	-14.0188
Pre Pain VASPM	Equal variances assumed	.986	.334	1.140	18	.269	.50000	.43843	-.42111	1.42111
	Equal variances not assumed			1.140	17.292	.270	.50000	.43843	-.42382	1.42382
Post Pain VASPM	Equal variances assumed	.450	.511	4.905	18	.000	2.10000	.42817	1.20044	2.99956
	Equal variances not assumed			4.905	17.859	.000	2.10000	.42817	1.20044	2.99956
difference of Pain VASPM	Equal variances assumed	3.284	0.087	-5.004	18	.000	-1.60000	.3197	-2.2717	-.9283
	Equal variances not assumed			-5.004	12.629	.000	-1.60000	.3197	-2.2928	-.9072
Pre Sleep FIQR	Equal variances assumed	23.01	.000	1.518	18	.146	.80000	.52705	-.30728	1.90728
	Equal variances not assumed			1.518	9.671	.161	.80000	.52705	-.37977	1.97977
Post Sleep FIQR	Equal variances assumed	10.14	.005	10.804	18	.000	4.20000	.38873	3.38331	5.01669
	Equal variances not assumed			10.804	15.391	.000	4.20000	.38873	3.37327	5.02673
difference of Sleep FIQR	Equal variances assumed	12.31	.003	-7.733	18	.000	-3.40000	.4397	-4.3238	-2.4762
	Equal variances not assumed			-7.733	12.462	.000	-3.4000	.4397	-4.4541	-2.4459
Pre Anxiety FIQR	Equal variances assumed	2.861	.108	.953	18	.353	.30000	.32146	-.37535	.97535
	Equal variances not assumed			.953	14.585	.356	.30000	.32146	-.38687	.98687

APPENDIX E.3.2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	DF	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Post Anxiety FIQR	Equal variances assumed	9.909	.006	6.172	18	.000	2.30000	.37268	1.51703	3.08297
	Equal variances not assumed			6.172	12.492	.000	2.30000	.37268	1.49154	3.10846
difference of Anxiety FIQR	Equal variances assumed	.209	.653	-6.626	18	.000	-2.0000	.3018	-2.6342	-1.3658
	Equal variances not assumed			-6.626	15.000	.000	-2.0000	.3018	-2.6342	-1.3658

APPENDIX E.4. Mann-Whitney Test

APPENDIX E.4.1. Ranks of Mann-Whitney Test

	Group	N	Mean Rank	Sum of Ranks
Pre total FIQR	1.00	10	13.15	131.50
	2.00	10	7.85	78.50
Post total FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Difference of total FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Pre Function FIQR	1.00	10	12.75	127.50
	2.00	10	8.25	82.50
Post Function FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Difference of Function FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Pre Overall Impact FIQR	1.00	10	13.20	132.00
	2.00	10	7.80	78.00
Post Overall Impact FIQR	1.00	10	15.50	155.50
	2.00	10	5.50	55.00

APPENDIX E.4.1. Ranks of Mann-Whitney Test

	Group	N	Mean Rank	Sum of Ranks
Difference of Overall Impact FIQR	1.00	10	5.60	56.00
	2.00	10	15.40	154.00
Pre Symptoms FIQR	1.00	10	12.50	125.00
	2.00	10	8.50	85.00
Post Symptoms FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Difference of Symptoms FIQR	1.00	10	5.50	55.00
	2.00	10	15.50	155.00
Pre Pain with VASPM	1.00	10	11.90	119.00
	2.00	10	9.10	91.00
Post Pain with VASPM	1.00	10	14.75	147.50
	2.00	10	6.25	62.50
Difference of Pain with VASPM	1.00	10	14.75	147.50
	2.00	10	6.25	62.50
Pre Sleep FIQR	1.00	10	11.35	113.50
	2.00	10	9.65	96.50
Post Sleep FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Difference of Sleep FIQR	1.00	10	5.50	55.00
	2.00	10	15.50	155.00
Pre Pain with VASPM	1.00	10	11.90	119.00
	2.00	10	9.10	91.00
Post Pain with VASPM	1.00	10	14.75	147.50
	2.00	10	6.25	62.50
Difference of Pain with VASPM	1.00	10	14.75	147.50
	2.00	10	6.25	62.50

APPENDIX E.4.1. Ranks of Mann-Whitney Test

	Group	N	Mean Rank	Sum of Ranks
Pre Sleep FIQR	1.00	10	11.35	113.50
	2.00	10	9.65	96.50
Post Sleep FIQR	1.00	10	15.50	155.00
	2.00	10	5.50	55.00
Difference of Sleep FIQR	1.00	10	5.50	55.00
	2.00	10	15.50	155.00
Pre Anxiety FIQR	1.00	10	11.40	114.00
	2.00	10	9.60	96.00
Post Anxiety FIQR	1.00	10	15.50	155.50
	2.00	10	5.65	56.50
Difference of Anxiety FIQR	1.00	10	5.90	59.00
	2.00	10	15.10	151.00

APPENDIX E.4.2. Test Statistics[b] of Mann-Whitney Test

		Score
Pre total FIQR	Mann-Whitney U	23.500
	Wilcoxon W	78.500
	Z	-2.007
	Asymp. Sig. (2-tailed)	.045
	Exact Sig. [2*(1-tailed Sig.)]	.043[a]
Post total FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.801
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]

APPENDIX E.4.2. Test Statistics[b] of Mann-Whitney Test

		Score
Difference of total FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.782
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Pre Function FIQR	Mann-Whitney U	27.500
	Wilcoxon W	82.500
	Z	-1.709
	Asymp. Sig. (2-tailed)	.088
	Exact Sig. [2*(1-tailed Sig.)]	.089[a]
Post Function FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.835
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Difference of Function FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.791
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Pre Overall Impact FIQR	Mann-Whitney U	23.000
	Wilcoxon W	78.000
	Z	-2.097
	Asymp. Sig. (2-tailed)	.036
	Exact Sig. [2*(1-tailed Sig.)]	.089[a]

APPENDIX E.4.2. Test Statistics[b] of Mann-Whitney Test

		Score
Post Overall Impact FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.872
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Difference of Overall Impact FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.774
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Pre Symptoms FIQR	Mann-Whitney U	30.000
	Wilcoxon W	85.000
	Z	-1.521
	Asymp. Sig. (2-tailed)	.128
	Exact Sig. [2*(1-tailed Sig.)]	.143[a]
Post Symptoms FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.798
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Difference of Symptoms FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.805
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]

APPENDIX E.4.2.Test Statistics[b] of Mann-Whitney Test

		Score
Pre Pain with VASPM	Mann-Whitney U	36.000
	Wilcoxon W	91.000
	Z	-1.124
	Asymp. Sig. (2-tailed)	.261
	Exact Sig. [2*(1-tailed Sig.)]	.315[a]
Post Pain with VASPM	Mann-Whitney U	7.500
	Wilcoxon W	62.5000
	Z	-3.361
	Asymp. Sig. (2-tailed)	.001
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Difference of Pain with VASPM	Mann-Whitney U	7.500
	Wilcoxon W	62.5000
	Z	-3.361
	Asymp. Sig. (2-tailed)	.001
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Pre Sleep FIQR	Mann-Whitney U	41.500
	Wilcoxon W	96.500
	Z	-.796
	Asymp. Sig. (2-tailed)	.426
	Exact Sig. [2*(1-tailed Sig.)]	.529[a]
Post Sleep FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.902
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]

APPENDIX F.4.2. Test Statistics[b] of Mann-Whitney Test

		Score
Difference of Sleep FIQR	Mann-Whitney U	.000.
	Wilcoxon W	55.000
	Z	-3.879
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Pre Anxiety FIQR	Mann-Whitney U	41.000
	Wilcoxon W	96.000
	Z	-.741
	Asymp. Sig. (2-tailed)	.459
	Exact Sig. [2*(1-tailed Sig.)]	.529[a]
Post Anxiety FIQR	Mann-Whitney U	1.500.
	Wilcoxon W	56.500
	Z	-3.797
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]
Difference of Anxiety FIQR	Mann-Whitney U	1.500.
	Wilcoxon W	56.500
	Z	-3.661
	Asymp. Sig. (2-tailed)	.000
	Exact Sig. [2*(1-tailed Sig.)]	.000[a]

a. Not corrected for ties. b. Grouping Variable: Group