

Effects of structural integration Rolwing® method and acupuncture on fibromyalgia*

Efeitos do método Rolwing® de integração estrutural e da acupuntura na fibromialgia

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ABSTRACT

BACKGROUND AND OBJECTIVES: Considering that a single approach does not encompass all symptoms of fibromyalgia syndrome and so indicated therapy is multidisciplinary, this study aimed at observing the efficacy of Structural Integration Rolwing method, of acupuncture, and of the combination of both techniques for relieving pain, anxiety and depression and for improving quality of life of fibromyalgia patients.

METHODS: Participated in the study sixty patients of the Multidisciplinary Pain Center, Neurological Clinic, Clinicas Hospital, School of Medicine, University of São Paulo, who were randomly distributed in three groups: group A – submitted to 10 acupuncture sessions; group B – 10 Rolwing sessions; and group C – 10 Rolwing and 10 acupuncture sessions. All patients have maintained their routine outpatient treatment and were evaluated according to Fibromyalgia Impact Questionnaire, Pain Numeric Verbal Scale and Beck Anxiety and Depression Inventories, applied during initial interview, after the last session and three months after treatment completion.

RESULTS: There has been statistically significant improvement in the three groups with regard to all evaluated items.

CONCLUSION: Both techniques, individually or in association, were beneficial during the three months of follow up.

Keywords: Acupuncture, Anxiety, Depression, Fibromyalgia, Rolwing.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Considerando-se que um único tratamento não abrange todos os sintomas apresentados no quadro da síndrome fibromiálgica e que, portanto, a conduta terapêutica indicada é multidisciplinar, o objetivo deste estudo foi verificar a eficácia do método Rolwing de Integração Estrutural, da acupuntura e da combinação das duas técnicas no alívio da dor, nos estados de ansiedade e depressão e na melhora da qualidade de vida dos fibromiálgicos.

MÉTODOS: Sessenta pacientes do Centro Multidisciplinar de Dor da Clínica Neurológica do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo foram randomizados em três grupos: grupo A: submetidos a 10 sessões de acupuntura, grupo B 10 sessões de Rolwing e grupo C 10 sessões de Rolwing e 10 de acupuntura. Todos mantiveram o tratamento ambulatorial de rotina e foram avaliados de acordo com o Questionário de Impacto da Fibromialgia, a Escala Verbal Numérica de Dor e os Inventários de Ansiedade e de Depressão Beck, aplicados durante a entrevista inicial, após a última sessão e três meses após o término do tratamento.

RESULTADOS: Houve melhora estatisticamente significativa nos pacientes dos três grupos em relação a todos os quesitos avaliados.

CONCLUSÃO: As duas técnicas foram benéficas tanto individual quanto associadamente, durante os três meses de acompanhamento.

Descritores: Acupuntura, Ansiedade, Depressão, Fibromialgia, Rolwing.

INTRODUCTION

Diffuse chronic pain for more than three months¹ is the primary fibromyalgia syndrome (FMS) manifestation. Fibromyalgia patients have amplified body sensations, which contribute for the onset of somatic symptoms. As a consequence, there is worsening of distress and decreased quality of life (QL)². Many people report mood changes, nonrestorative sleep, stiffness and disproportional fatigue as compared to the effort³ and may use pain as a means of communication. There is poor tolerance to stress, which favors ambivalence and dependence relationship with relatives and health professionals. Symptoms may be triggered, worsened or maintained by emotional influences⁴. FMS

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symptoms are not resolved with a single approach so, a multi-modal treatment integrating patients' education and pharmacological and non-pharmacological therapies is recommended³. Rolwing is a method developed by North-American biochemist Ida Pauline Rolf⁵ who believed that by enhancing body structural organization (posture), it would be possible to change joint bone relations and improve musculoskeletal disorders. The method aims at improving human body balance and alignment quality via myofascial release and movements enhancement and orientation. It is an integration procedure of human body structure which aims at improving body functions by aligning its structure⁵. It consists of deep manual interventions (myofascial release) applied to the elastic structure of the loose connective tissue (myofascial), and of movements re-education. It aims at showing patients that it is possible to find means of communication different from pain, thus being possible to overcome it. Ida Rolf believed that a balanced body makes people better.

Acupuncture is Traditional Chinese Medicine (TCM) practice targeted to treat or prevent diseases by means of methods, including needle insertion on specific body points. These points are located on channels or meridians through which *qi*, which regulates body functions, circulates. Pain and disease are treated with the application of needles to those points to allow free *qi* flow⁶. The 1997 consensus of the National Institute of Health considers acupuncture as supplemental therapy to handle certain painful conditions⁷. The demonstration of its efficacy is complex and sometimes controversial⁸. Recent systematic reviews on acupuncture to manage FMS have resulted in different conclusions, such as lack of evidence⁹, poor analgesic effect¹⁰ and possible effectiveness^{11,12}.

Both Rolwing method and acupuncture, worldwide known as supplemental techniques, do not replace conventional approaches, but may be part of the multidisciplinary management often indicated to chronic pain patients. It is worth stressing that such approaches may be useful for other diagnoses and symptoms; however evaluation and intervention should be carried out by a specialist professional.

This study aimed at evaluating the effect of acupuncture, Rolwing method and the association of both techniques on pain, anxiety, depression and QL of FMS patients.

METHODS

This was a prospective and comparative study, complementary to pharmacological treatment. We have selected 60 people diagnosed by the neurologist as having FMS according to medical criteria proposed by the American College of Rheumatology in 1990¹³. Patients were 18 years old or above, have agreed to voluntarily participating in the study, have signed the Free and Informed Consent Term (FICT) and have met research protocol proposals.

Inclusion criteria were patients able to autonomously understand and answer to proposed tests, who had not been previously treated with Rolwing method or acupuncture until one year before treatment. All of them have maintained previous

routine ambulatory treatment. Exclusion criteria were patients with severe psychic disorders or illiterate.

Because pain is a subjective symptom and patients were already being treated, the group itself was considered control. We decided to compare the group to itself, where patients were their own evaluators, before and after application.

Subjects were randomly distributed in three groups of 20 patients. Group A patients were submitted to 10 weekly acupuncture sessions lasting 20 minutes each and performed by acupuncturist physician. Eighteen needles were applied to points Bl 10, LI 17, GB 21, SI 13, Ki 25, LI 11, Bl 53, Bl 36 and Sp 10.

Group B was submitted to 10 weekly Rolwing method sessions. All patients were seen by a psychologist specialized in such method. Sessions lasted 30 minutes each and consisted of myofascial release on specific body areas and of movements re-education. We have reinforced respiratory freedom and orientation to the vertical axis, contralateral gait and light and fluid movements, as well as relief and wellbeing sensations. Patients were encouraged to incorporate the acquired learning to their daily lives.

Group C was submitted to 10 weekly sessions of the Rolwing method associated to 10 acupuncture sessions on the same day. Additional details of the intervention according to STRICTA (STandards for Reporting Interventions in Clinical Trials of Acupuncture)¹⁴ are presented below.

Acupuncture rational

Treatment was based on FMS painful points associated to TCM points.

Needling details

Eighteen muscular needles were applied in variable depths until reaching *qi*, without manipulation, which were maintained for 30 min. Points and types of needles were: Bl 10, GB 21, SI 13, LI 11, Bl 53, Sp 10 (0.3mm diameter and 40mm length), LI 17, Ki 25 (0.25mm diameter and 25mm length) and Bl 36 (0.3mm diameter and 70mm length).

Bl, Bladder; GB, Gallbladder; LI, Large Intestine; Ki, Kidney; SI, Small Intestine; Sp, Spleen-pancreas.

Treatment regimen

Patients were treated once a week.

Control or comparative interventions

Comparative intervention was the Rolwing method to evaluate the effect of the association of interventions to treat FMS. Rolwing sessions were performed in the same acupuncture environment and context.

All subjects were evaluated in the beginning, at the end of the 10 sessions, and three months after treatment by evaluator blind for treatment groups. Evaluation tools were Pain Verbal Numeric Analog Scale (VNAS), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and Fibromyalgia Impact Questionnaire (FIQ).

VNAS has measured pain in a scale from zero to 10. Patients

were oriented to verbalize the point corresponding to the magnitude of their pain between the extremes zero, that is, 'no pain' and 10, that is 'unbearable pain'. BDI and BAI have measured depression and anxiety intensity by a self-applicable questionnaire. According to FIQ, zero indicates best QL and 100 the worst QL. These tests consider the subjective aspect of analyzed items and patients evaluate their pain as well as their emotional symptoms.

Statistical analysis

For statistical analysis, patients' characteristics were described with likelihood ratio tests and, according to groups, with the use of absolute and relative frequencies. We have also checked the association among groups. Age was described according to groups with summary-measures which were compared among groups with the analysis of variance (ANOVA).

Results of anxiety, depression and pain intensity were described according to the groups and evaluation moments with absolute and relative frequencies. FIQ variables and original BAI, BDI and PAIN scales were described with summary-measures according to groups and evaluation moments. Variables were compared to general linear models with two factors and repetitive measures with estimates of parameters, by square minimums, followed by Bonferroni multiple comparisons, if needed, to see between which groups and moments there have been differences. Significance level was 5% ($\alpha=0.05$).

This study was approved by the Ethics Committee for Research Projects Analysis, Clinical Department, HCFMUSP in 2010, registered with n. 0188/2010.

RESULTS

Participated in the study 60 subjects, being 54 females and 6 males, aged between 30 and 73 years (mean=53.43±9.64 years). The three groups were similar in baseline demographic characteristics and symptoms intensity (Table 1). Subjects have tolerated well the treatments and have reported no adverse effects.

There has been statistically significant difference in the first evaluation moment among the three groups in all items, which was not true for the second moment, showing that results were maintained (Tables 2 and 3).

Scales were statistically different among evaluation moments ($p<0.001$) regardless of group, as well as anxiety (BAI) and QL (FIQ) ($p=0.008$ and 0.028 , respectively). Table 3 shows improvement with the treatment in all evaluated scales. Pain intensity had statistically significant mean improvement at the end of treatment and three months after treatment. The acupuncture group had higher anxiety scores as compared to other groups. QL has shown statistically higher scores, meaning less improvement of patients treated with acupuncture as compared to those treated with acupuncture and Rolfing.

Table 1. Sample characteristics

Variables	ACP		Groups ROLF		ACP+ROL		Total		p value
	n	%	n	%	n	%	n	%	
Gender									0.561
Female	18	90.0	19	95.0	17	85.0	54	90.0	
Male	2	10.0	1	5.0	3	15.0	6	10.0	
Skin color									0.227
Yellow	0	0.0	1	5.0	0	0.0	1	1.7	
White	16	80.0	15	75.0	12	60.0	43	71.7	
Mulatto	2	10.0	4	20.0	6	30.0	12	20.0	
Black	2	10.0	0	0.0	2	10.0	4	6.7	
Education									0.321
Illiterate	0	0.0	1	5.0	1	5.0	2	3.3	
Basic	12	60.0	11	55.0	14	70.0	37	61.7	
High school	5	25.0	6	30.0	1	5.0	12	20.0	
University	3	15.0	2	10.0	4	20.0	9	15.0	
Marital status									0.550
Married	14	70.0	1	5.0	8	40.0	33	55.0	
Divorced	2	10.0	11	5.0	3	15.0	6	10.0	
Single	2	10.0	4	20.0	5	25.0	11	18.3	
Widow/er	2	10.0	4	20.0	4	20.0	10	16.7	
Total	20	100	20	100	20	100	60	100	

Likelihood ratio test results; ACP = acupuncture; ROL = Rolfing.

Table 2. Evaluation of anxiety, depression, pain intensity and quality of life for each group in the three moments (pre, post and 3 months after intervention)

		Treatments		
		Acupuncture	Rolwing	Acupuncture + Rolwing
BAI	Pre	34.90 (10.60)	28.35 (11.03)	28.15 (12.16)
	Post	17.70 (10.12)	12.05 (7.93)	9.10 (8.24)
	3 months	16.26 (9.45)	12.44(5.91)	11.80 (7.25)
BDI	Pre	31.75 (11.82)	26.40 (10.71)	26.65 (13.18)
	Post	15.60(7.63)	12.55 (9.31)	9.95 (5.74)
	3 months	15.95 (8.44)	12.61 (9.04)	12.30 (5.51)
Pain	Pre	8.85 (1.23)	8.90 (1.48)	8.80 (1.20)
	Post	4.65 (2.50)	4.55 (2.26)	3.45 (1.76)
	3 months	5.47 (2.09)	5.72 (2.59)	4.85 (1.53)
FIQ	Pre	75.96 (11.30)	71.43 (16.01)	69.65 (10.39)
	Post	46.13 (17.99)	39.02 (20.33)	29.97 (12.51)
	3 months	47.40 (14.97)	44.16 (19.61)	37.83 (13.09)

All variables are expressed in means (standard deviation); BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; FIQ = Fibromyalgia Impact Questionnaire.

Table 3. Multiple comparisons to evaluate differences among observed scores in the level of anxiety, depression, pain intensity and quality of life

Variables	Comparison	Mean estimated difference	Standard error	p value
BAI	Pre vs Post	16.73	1.53	<0.001*
	Pre vs 3 months	16.41	1.48	<0.001*
	Post vs 3 months	-0.32	1.09	>0.999
	ACP vs ROL	5.72	2.26	0.043*
	ACP vs ACP + ROL	6.63	2.20	0.012*
	ROL vs ACP + ROL	0.91	2.24	>0.999
BDI	Pre vs Post	15.31	1.24	<0.001*
	Pre vs 3 months	14.44	1.38	<0.001*
	Post vs 3 months	-0.86	0.60	0.465
Pain	Pre vs Post	4.57	0.32	<0.001*
	Pre vs 3 months	3.46	0.26	<0.001*
	Post vs 3 months	-1.11	0.31	0.002*
FIQ	Pre vs Post	33.36	2.27	<0.001*
	Pre vs 3 months	29.16	2.27	<0.001*
	Post vs 3 months	-4.20	2.22	0.191
	ACP vs ROL	4.23	3.96	0.870
	ACP vs ACP + ROL	10.56	3.86	0.025*
	ROL vs ACP + ROL	6.33	3.91	0.333

* Significant (p<0.05)

ACP = acupuncture; BAI = Beck Anxiety Inventory = BDI, Beck Depression Inventory; FIQ = Fibromyalgia Impact Questionnaire; ROL = Rolwing.

DISCUSSION

Pain, when understood as sensory warning signal, calls the attention to physiological processes unbalance and may make individuals aware that something might not be well with them. The challenge of this study was to show that it is possible to change one's coping, that is, how we cope with pain-induced stress and, with this, decrease intensity and anxiety levels, thus improving QL.

Acupuncture considers humans as a whole and weighs not only functional acupoint aspects, but also different meridian functions which represent the somatic communication system. In relating physical structure changes to meridians, it recognizes a body vital and energetic state, which allows for

the development of a treatment strategy to reach general balance.

The Rolwing method proposes the improvement of musculoskeletal structures communication with the nervous system⁵. Ida Rolf has considered that what prevents ideally free and natural movement should be related to perception, neuromotor coordination, myofascial tissue and/or emotional meaning. She reported that giving meaning to pain is also a way to modulate it, since this may lead patients to represent and solve their conflicts. Fascial adaptation supports the postural pattern, not always beneficial, and movement habits adopted by individuals. Overloaded muscles shorten connective tissue and make them lose their natural elasticity. There is disruption of the original shape, of balance and alignment, as reac-

tion to the way people moves.

This way, biomechanical function and stability may be enhanced by fascial manipulation and by sensory-motor education by reaching minimum stress and overload and maximum daily movement efficacy. Patients are active during treatment. When noticing stress relief and development of functional resources, they learn how to deal with established habits which cause biomechanical stress¹⁵, and move in a different manner. In the three groups of patients of our study there has been pain intensity, anxiety, depression and QL improvement. At treatment completion, there has been mild pain intensity return, which may be caused by returning to daily activities, by short treatment duration to maintain benefits, among other possibilities.

Our results are in line with Targino et al.¹⁶ who have shown that acupuncture as complementary treatment, improves pain intensity and QL during at least three months after treatment. There is also similarity with Stall & Teixeira¹⁷ results when studying fibromyalgia patients treated with Rolwing as additional approach and with Castro-Sanchez et al.¹⁸ who have investigated massage as useful approach for FMS.

The Rolwing method may have provided positive results for emphasizing that therapeutic touch should induce a pleasant sensation leading to relaxation. By reactive pressure, it contributes for muscle tone recovery. For Ida Rolf, touch is a language awaking memories of experiences previous to pain and, by bringing them back, revives old feelings which may be translated into relief, lightness and pleasure⁵.

The purpose of Ida Rolf to relief pain is to adjust the fascial system with manipulation, together with movements coordination. Jacobson, in his review, reports chronic pain improvement in patients treated with Rolwing¹⁹. There are also reports on decreased levels of anxiety and depression¹⁹. However, clinical efficacy is still limited due to the scarcity of studies. According to Ida Rolf, people's health is a consequence of their alignment as a whole. Segments should be organized to maintain balance and preserve the ability of both plastic and flexible adaptation without causing excessive muscle effort. For the author, straightening human structure means optimizing verticality, gait and the way each isolated part is related to the other and to the whole.

Similarly, the fascial system offers physiological basis to explain acupuncture effects. Langevin & Yandow²⁰ have found 80% correspondence between acupuncture point sites and fascias. Finando & Finando²¹ have described fascial cell structure as cytoskeleton under continuous stress able to transmit mechanical forces to the whole system and to interfere with body movement, adaptation, lubrication and recovery. They have added that acupuncture treatment depends on fascial stimulation. The correspondence of this chain supplies evidence that may be the anatomic basis for acupoints and for major acupuncture meridians to exist on myofascial layers of the human body^{22,23}.

However, the ability for change and transformation remains characteristic of the fascial system due to its plastic nature. This is a major attribution made by Rolf when proposing that

myofascial tissue manipulation could activate this function. Acupuncture strives for vital flow balance via fascial chain. Both for Rolwing and acupuncture, a successful balance makes up the wellbeing scenario, because they convey sensation of tranquility and harmony with the environment.

Liptan²⁴, recognizing evidences of intramuscular connective tissue disorder in MFS has suggested the expansion of manual therapies directly working on fascia, as Rolwing. Rolf has stated that the freer the mobility, the more effective is the maintenance and adaptation of physical and emotional balance⁵.

QL sensation is complex and subjective, as well as health and pain sensations. However, commonsense understands that health is not just lack of disease but also an important component for better QL. This implies individuals able to identify and meet their aspirations, meet their needs and cope well with the environment. The ability to manage stress generated by sudden changes or chronic dissatisfaction is critical for the maintenance of health and improvement of QL.

These therapies may become more than palliative provided the objective is not just suppressing symptoms but rather inducing patients to overcome pain, translating it into more positive life attitudes.

The study was comparative and aimed at evaluating the effect of Rolwing and acupuncture, individually and in association. So, we have not considered the inclusion of placebo control groups.

Due to the characteristics of the study, it was not possible to blind subjects and appliers.

CONCLUSION

The study has shown that the three evaluated treatment methodologies were effective with statistically significant differences, both individually and in association, essentially with regard to pain intensity improvement, affective aspects, such as anxiety and depression, and QL improvement during three months after treatment.

Theoretically, the association of both interventions would yield better results as compared to individual interventions. However, it was observed that the association of Rolwing and acupuncture was more effective as compared to acupuncture with regard to anxiety (BAI) and quality of life (FIQ). Results of the association were not different as compared to Rolwing alone. The lack of significance may be due to the limited number of evaluated subjects and to treatment duration.

Rolwing method and acupuncture were useful as adjuvant therapy for MFS patients. The unique proposal of associating both techniques as multidisciplinary treatment has also incorporated benefits to MFS therapeutic methods, because it makes patients abler to relieve their own pain and to improve their physical and mental health.

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REFERENCES

1. Arnold LM, Clauw DJ, McCarberg BH. Improving the recognition and diagnosis of fibromyalgia. *Mayo Clin Proc.* 2011;86(5):457-64.
2. Verbunt JA, Pernot DH, Smeets RJ. Disability and quality of life in patients with fibromyalgia. *Health Qual Life Outcomes.* 2008;6:8.
3. Arnold LM, Clauw DJ, Dunegan LJ, Turk DC. A framework for fibromyalgia management for primary care providers. *Mayo Clin Proc.* 2012;87(5):488-96.
4. Bennett RM, Jones J, Turk DC, Russell IJ, Matallana L. An internet survey of 2,596 people with fibromyalgia. *BMC Musculoskelet Disord.* 2007;8:27.
5. Rolf IP. Rolwing: a integração das estruturas humanas. São Paulo: Martins Fontes; 1999. 270p.
6. Han JS. Acupuncture analgesia: areas of consensus and controversy. *Pain.* 2011;152(3 Suppl):S41-8.
7. NIH Consensus Conference. Acupuncture. *JAMA.* 1998;280(17):1518-24.
8. Ernst E. Acupuncture: what does the most reliable evidence tell us? *J Pain Symptom Manage.* 2009;37(4):709-14.
9. Martin-Sanchez E, Torralba E, Diaz-Dominguez E, Barriga A, Martin JL. Efficacy of acupuncture for the treatment of fibromyalgia: systematic review and meta-analysis of randomized trials. *Open Rheumatol J.* 2009;3:25-9.
10. Langhorst J, Klose P, Musial F, Irnich D, Hauser W. Efficacy of acupuncture in fibromyalgia syndrome—a systematic review with a meta-analysis of controlled clinical trials. *Rheumatology (Oxford).* 2010;49(4):778-88.
11. Cao H, Liu J, Lewith GT. Traditional Chinese Medicine for treatment of fibromyalgia: a systematic review of randomized controlled trials. *J Altern Complement Med.* 2010;16(4):397-409.
12. Deare JC, Zheng Z, Xue CC, Liu JP, Shang J, Scott SW, et al. Acupuncture for treating fibromyalgia. *Cochrane Database Syst Rev.* 2013;5:CD007070.
13. Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, et al. The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis Rheum.* 1990;33(2):160-72.
14. MacPherson H, Altman DG, Hammerschlag R, Youping L, Taixiang W, White A, et al. Revised STandards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA): extending the CONSORT statement. *PLoS Med.* 2010;7(6):e1000261.
15. Jacobson E. Structural integration: origins and development. *J Altern Complement Med.* 2011;17(9):775-80.
16. Targino RA, Imamura M, Kaziya HH, Souza LP, Hsing WT, Furlan AD, et al. A randomized controlled trial of acupuncture added to usual treatment for fibromyalgia. *J Rehabil Med.* 2008;40(7):582-8.
17. Stall P, Teixeira MJ. Fibromyalgia syndrome treated with the structural integration Rolwing® method. *Rev Dor.* 2014;15(4):248-52.
18. Castro-Sanchez AM, Mataran-Penarrocha GA, Granero-Molina J, Aguilera-Manrique G, Quesada-Rubio JM, Moreno-Lorenzo C. Benefits of massage-myofascial release therapy on pain, anxiety, quality of sleep, depression, and quality of life in patients with fibromyalgia. *Evid Based Complement Alternat Med.* 2011;2011:561753.
19. Jacobson E. Structural integration, an alternative method of manual therapy and sensorimotor education. *J Altern Complement Med.* 2011;17(10):891-9.
20. Langevin HM, Yandow JA. Relationship of acupuncture points and meridians to connective tissue planes. *Anat Rec.* 2002;269(6):257-65.
21. Finando S, Finando D. Fascia and the mechanism of acupuncture. *J Bodyw Mov Ther.* 2011;15(2):168-76.
22. Dorsher PT. Myofascial meridians as anatomical evidence of acupuncture channels. *Med Acupunct.* 2009;21(2):91-7.
23. Bai Y, Wang J, Wu JP, Dai JX, Sha O, Tai Wai Yew D, et al. Review of evidence suggesting that the fascia network could be the anatomical basis for acupoints and meridians in the human body. *Evid Based Complement Alternat Med.* 2011;2011:260510.
24. Liptan GL. Fascia: A missing link in our understanding of the pathology of fibromyalgia. *J Bodyw Mov Ther.* 2010;14(1):3-12.