Journal of Yoga & Physical Therapy
ISSN: 2157-7595

do Rosário, J Yoga Phys Ther 2012, 2:6
DOI: 10.4172/2157-7595.1000128

Research Article Open Access

Efficiency of Modified Yoga Positions to Treat Postural Pathologies Associated Pain: A Literature Review

José Luís Pimentel do Rosário*

State University of the West-Center–UNICENTRO, PR-Brazil

Abstract

Many musculoskeletal pains are related to poor posture. According to a number of authors, poor posture predisposes an individual to severe joint stress and increases muscle energy expenditure, thereby creating tensional stress in these structures. Muscular Chain Therapy (MCT) is a technique that uses modified yoga positions to treat postural pathologies, among others, fitting these yoga positions into the Mézières concept of muscular chains. The body works as a whole chain and these chains can be subdivided into the following: Posterior Chain; Inspiratory Chain; Hip Adductor Chain; Arm Internal Rotator Chain; Arm Adductor Chain and Arm Elevator-Abductor Chain. The aim of the present study was to review Muscular Chain Therapy assessment and treatment, and how it works in terms of treating postural deviations and related musculoskeletal pain.

Keywords: Manual therapy; Muscular chain; Posture; Yoga

Introduction

Static posture refers to the alignment and maintenance of body segments in certain positions. Some postural misalignments may adversely affect the muscular efficiency, predispose individuals to pain and pathological musculoskeletal conditions, and provoke unaesthetic alterations [1,2].

According to Kappler [3], a good postural balance creates less stress on joints, requires less muscle activity to maintain balance and therefore, is the position of maximum effectiveness. An imbalanced posture should be compensated by changes in joint position, which in turn, must be maintained by an increase in muscle activity and cause injuries [3], as well as the imbalanced muscles [4,5]. Thus, the postural imbalance results in excess of energy consumption [3].

A number of authors have stated that if body segments are kept out of alignment for extended periods, some of the muscles involved are used in a shortened position, as a consequence. These muscles are usually seen as strong, while their antagonists are taken to be elongated and weak [6], and this is one of the effects of poor posture. These deviations can be unsightly, adversely affecting muscular efficiency, predisposing individuals to pathologic musculoskeletal conditions. One of the major symptoms of postural change is pain [1].

According to Lee [7], good posture creates the least amount of joint stress, and requires the least amount of muscle activity. Consequently, it is the position of maximum efficiency. The same author also described how a deviation from optimal positioning should be compensated by changes in the joint position, which in turn, must be maintained by an increase in muscle activity. Therefore, postural instability results in an excess of power consumption. This change in joint position described by Lee [7], is very similar to the concept of chiropractic subluxation. Generations of chiropractors have claimed that a large percentage of all diseases are caused by subluxation [8].

In 1947, the kinesiotherapist Françoise Mézières, the mother of therapies based in muscular chain [9,10], stated that human muscles are completely inter-related, and demonstrated that there is not just a single muscle that causes bad posture, but chains of muscles that can end up causing a pathology in a specific place from a generalized tension. Therefore, a localized muscular action provokes reactions at a distance, underlining that the root of the problem can be distant from where the patient feels pain [11].

The Muscular Chain Therapy (MCT) uses this postural concept, observed and elaborated by Mézières, in order to understand the posture. For the evaluation, MCT uses two yoga positions and five for the treatment. These yoga positions were modified, aiming to stretch at the same time, all the muscles of the chain to be worked. A number of existing scientific studies have approached MCT or similar techniques based on Meziérès muscular chains and modified yoga postures, with assistance of a therapist. These studies have produced results in treating various musculoskeletal conditions [12-20].

Considering the fact that poor posture causes joint positioning changes, and that this malposition can cause pain, the origin of which is far from the location, it is important to understand the functioning and application of the muscular chains, and to develop a therapy that successfully uses this theory in clinical practice.

Materials and Methods

The Medline and Lilacs databases were consulted for relevant articles from 2002 to 2012, with the key words "posture" and "postural". The abstracts of articles were read in order to confirm, if they satisfied the inclusion criteria. Only articles and books in English, Portuguese, French, Italian or Spanish were considered, and some type of muscular chain technique must have been used or described, as in the following description.

Muscular Chains Therapy

Muscular chains are formed by gravitational muscles that work synergistically in the same chain, and it is very well explained by the theory of Anatomy Trains [21], and of course, the maintenance of the

***Corresponding author:** José Luís Pimentel do Rosário, Assistant Professor, State University of the West-Center– UNICENTRO, Rua Padre Chagas apto 4290 22-Central Guarapuava-PR-Brazil, Tel: 55 (42) 9992-9992; E-mail: ze.fisio@gmail.com

Received November 22, 2012; **Accepted** December 15, 2012; **Published** December 17, 2012

Citation: do Rosário JLP (2012) Efficiency of Modified Yoga Positions to Treat Postural Pathologies Associated Pain: A Literature Review. J Yoga Phys Ther 2:128. doi:10.4172/2157-7595.1000128

standing position against the action of gravity [22]. The concept of muscular chains is based on the observation that the shortening of a muscle creates compensation in the adjacent and also distant muscles. In this study, the fascial treatment was not added, in order to emphasize the muscles. Therefore, the MCT is a global stretching technique that uses postural positions for stretching several muscles simultaneously, rather than treating an isolated muscle [1]. These muscles belong to the same muscular chain [22]. Basically, we have two main chains: anterior and posterior, which have a lot of similarities with the superficial frontal line and Superficial back line [21], respectively.

The Posterior Chain includes the following muscles: Gastrocnemius and Soleus; Flexor Hallucis Brevis; Flexor Hallucis Longus; Short Flexor of Fingers and Flexor Digitorum Longus; Adductor Hallucis; Abductor Hallucis; Hamstrings (Semitendinosus; Semimembranosus and Biceps Femoris); popliteal; Gluteus maximus. It also includes the following: Paraspinals: Iliocostalis Lumborum; Iliocostalis Thoracis; Iliocostalis Cervicis; Longissimus Thoracis; Longissimus Cervicis; Longissimus Capitis; Spinalis Thoracis; Spinalis Cervicis; Spinalis Capitis; Semispinalis Dorsi; Semispinalis Cervicis; Semispinalis Capitis; Multifidus; Rotatores; Interspinales; Intertransversarii [22,23].

The Anterior Chain is divided in two: The Inspiratory Chain and the Hip Internal Rotator Chain.

The Inspiratory Chain includes the following muscles: Scalenus; Sternocleidomastoid; Pectoralis Minor; Intercostals; Diaphragm [22,23].

The Hip Internal Rotator Chain includes the following muscles: Iliacus; Psoas Minor; Psoas Major; Adductor brevis; Adductor longus; Adductor magnus; Gracilis; Pectineus [22,23].

The Arm Chains can be divided in three: the Shoulder Adductor Chain that may be considered part of Anterior Chain; the Shoulder Elevator-Adductor Chain that may be considered part of the Posterior Chain; and the Arm Internal Rotator Chain which is neutral, because it is associated to both Anterior and Posterior Chains, and can also be stretched in Anterior and Posterior postures.

The Arm Internal Rotator Chain includes the following muscles: Pectoralis Major; Brachial Biceps and Brachialis; Pronator Teres and Pronator Quadratus; Flexor Digitorum Profundus; Flexor Digitorum Superficialis; Flexor Pollicis Longus and Adductor Pollicis; Abductor Pollicis Brevis; Flexor Pollicis Brevis; Opponens Pollicis [22,23].

The Shoulder Elevator-Adductor Chain includes the following muscles: Subscapularis; Deltoid; Upper Trapezius [22,23].

The Shoulder Adductor Chain includes the following muscles: Pectoral Major; Coracobraquialis; Subscapularis [22,23].

This muscular chain concept differs from the segmental stretch, which treats each shortened muscle separately, usually those directly involved in the joint with decreased range of motion. MCT applies a long duration stretch, which lasts approximately 15 minutes per postural position, while coupled with eccentric physical exertion for the posture maintenance, featuring an active form of stretching [1,23]. Clinically, the MCT has been efficient treating postural deviations and providing greater flexibility [23].

Assessment with MCT is described according to Rosário et al. [24].

Assessment

Examination of the anterior chain: The anterior muscles that can raise the lordosis are the diaphragm, the iliopsoas and the pubic adductors. They pull the lumbar spine forward, placing the pelvis in anteversion. Therefore, it was necessary to rectify the lumbar in order to test this chain. The Tadasana – Mountain Pose – is used to assess the Anterior Chain (Figure 4). Patients who have either shortening or tension in this chain exhibit compensatory changes.

Assessment Steps

1. Place the individual standing, with their heels together.
2. Rectify lumbar lordosis by retroversion.
3. Observe the compensation, which may be one of the following:

- Leaning the torso back;

- Bending the knees. A small flexion is normal;

- Chest blocked in an inspiratory position;

- Protrusion of the head and shoulders.

Examination of the posterior chain: The posterior spinal muscles flatten and push the lumbar spine back, leading to pelvis retroversion, with a tendency to keep the sacrum in a horizontal position. It is necessary to flex the trunk, in order to assess this chain. The flexion alone can provide some clues about posture. Since this chain tends to invert the lumbar curve causing a kyphosis, it is important to request a small lumbar lordosis with the hip flexion, in order to put this chain in full tension. Consequently, the trunk will be raised, but a loosening of hip flexion will be avoided. When it exists, shortening becomes obvious at this stage. The Shaktyasana–The Shakty goddess pose–is used to assess the Posterior Chain (Figure 5).

Assessment steps

1. The subject must lean forward with the knees straight and the heels together. Note if the curvature of the spine and the spinous processes are all clearly visible.
2. To complete the test, align the lumbar spine, requesting a small lumbar lordosis.
3. A shortened individual will extend the trunk, opening the hip angle of flexion. Another possible abnormality is the opening of the tibio-tarsal angle, which is the angle formed between the foot and the tibia.

Comparison of chains: The most compromised chain is the one presenting the highest compensation in the test. This chain is the first to be treated.

Examination of the arm chains: If the anterior chain is the most compromised, this test should be done in a standing position, with rectification of the lumbar spine. If the posterior chain is the most compromised, the test should be performed seated, holding a small lordosis. After this positioning, it is essential to confirm that the thoracic curve is not flattened and to add adduction and depression of the scapula, external rotation of the arm, forearm supination and extension of the wrist and fingers.

After aligning the posture, it is necessary to observe the compensation generated by both abduction, and then adduction of the upper limbs. If abduction generated more compensation than adduction of the upper limbs, it was given priority in terms of treatment. If adduction compensated more, adduction was the priority.

Treatment

Treatment consists of two 15-minute postures. Before treatment, the patients were taught how to separate their breathing by region: apical; lower ribs and diaphragmatic breathing, in order to help the maintenance of posture. The selection of posture was based on the assessment described above. If there were more alterations in the posterior chain, two postures of the posterior chain were performed. If there were more alterations in the anterior chain, two postures of the anterior chain were performed. If the two chains exhibited similar alterations, treatment involved one posture of each chain. The therapist should choose a lie down posture in the following circumstances:

1. More work was needed on breathing.
2. Pain or disability prevented the patient from remaining standing or sitting.
3. If the work was focused on the head, neck or upper limbs.

Postures with load (sitting or standing) should be selected in the following cases:

1. Focus on the trunk or lower limbs.
2. To provide a stronger stretch or improve muscle strength.

All postures must be performed actively by the patient, which helps to promote proprioception and eccentric stretching. It is possible to perform at least two postures in one session. Sessions are conducted once or twice a week, depending on whether the problem to be treated is chronic or acute. The muscles involved in each of the modified yoga positions are those found in the posterior and anterior Muscular Chains. Note that acute cases may involve less therapy time and a greater session frequency [10,25].

The following is a description of postures according to Rosário et al. [24].

Supta Baddha Konasana: Reclining Bound Angle Pose (anterior chain) (Figure 1)

- The patient is positioned in the supine decubitus, with the arms against the body;
- The patient puts the soles of the feet together;
- As a rule, the total external rotation of the femur should be sought. If the patient has excessive external rotation of the femur, a neutral position of femur rotation can be adopted;
- Neck traction, while maintaining physiological neck lordosis;
- The tension point of the posture can be found by bringing the heels forward, extending the knees, leading to more difficulty in keeping the patient's lower back flat against the table.

Viparita Karani: Inverted Legs Pose (posterior chain) (Figure 2)

- The patient is positioned in the supine decubitus, with the arms against the body;
- The patient puts the soles of the feet together;
- As a rule, the total external rotation of the femur should be sought. If the patient has excessive external rotation of the femur, a neutral position of femur rotation can be adopted;
- Neck traction while maintaining physiological neck lordosis;
- The therapist flexes the patient's hip holding them by the heels. Alternatively, the therapist can use a support for the heels (Figure 2), in order to free the hands for treatment;
- The tension point of the posture can be found by bringing the heels forward, extending the knees, leading to more difficulty in keeping the patient's lower back flat against the table.

Tadasana: Mountain Pose – against the wall (anterior chain) (Figure 3)

- Check the distance from the wall. The closer to the wall, the more difficult the exercise is.
- The knees are slightly semi-flexed and rotated laterally.
- The pelvis is in slight retroversion with the dorsal and lumbar regions against the wall.
- Thoracic and cervical curves maintained in physiological position; lumbar rectified.
- Upper limbs: place the shoulder blades against the wall, with the arms abducted 30° in neutral rotation, the elbows extended, supinated forearms, wrists in a neutral position and fingers relaxed.

Tadasana: Mountain Pose – free version (anterior chain) (Figure 4)

- Similar to the previous position, but without the support of the wall. The therapist supports the patient's occipital.

Figure 1: Supta baddha konasana–reclining bound angle pose.

Figure 2: Viparita karani–inverted legs pose.

Shaktyasana: The Shakty goddess pose (posterior chain) (Figure 5)

- Similar to the posture standing in the center, but maximum hip flexion is possible, without reversing the physiological curves of the spine.

Dandasana: Staff Pose (posterior chain) (Figure 6)

- The patient sits with a hip flexion that imposes difficulty in maintaining the physiological curves of the spine, without ever reversing them.
- The therapist supports the patient's occipital with his hand.
- The knees are bent and the soles of the feet are together.

The starting position would be Baddha Konasana (Bound Angle Pose), moving to Dandasana (Staff Pose).

Evolution of postures

During the 20 minutes of posture, the therapist must seek to maintain the symmetry of the patient. The difficulty of the posture is gradually increased, until the patient can go no further. The name of the evolution of the posture is applied to this process, and it must follow certain rules:

- At no time is it permissible to reverse the physiological curves;
- All the postures need gradual extension of the lower limbs;
- In the final minutes of the postures, it's important to make a dorsiflexion. In standing postures a ramp is used;
- The postures of the posterior chain need a gradual increase in hip flexion;

Figure 3: Tadasana–mountain pose–against the wall.

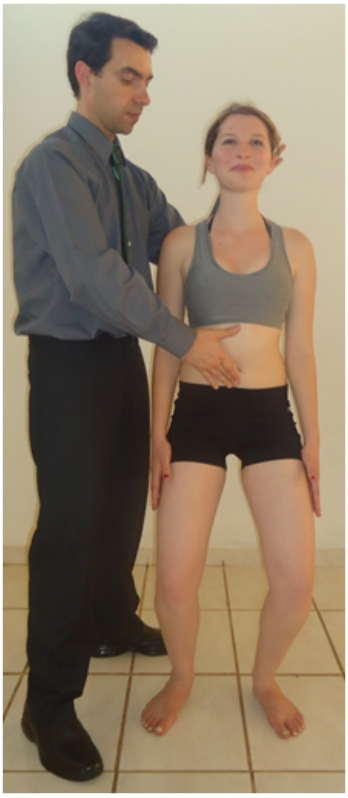

Figure 4: Tadasana–mountain pose–free version.

- The evolution of arm chains in all postures is a gradual increase of the adduction of the shoulder blades, shoulder external rotation, forearm supination, wrist and finger extension;
- There is only evolution in adduction or abduction of the arms in the lying postures. In the standing postures, the arms remain adducted and close to the body at all times.

Results

Beyond the obvious indication of posture treatment, there are some musculoskeletal problems treated by therapies related to muscular chain. The present work had a review of articles that used the Muscular Chain concept and at least one of the Yoga postures previously described, or similar to one of them for treatment. Canto et al. [13] studied the efficiency of MCT in individuals with lower back pain, in terms of the level of pain and functional disability. Thirty-five individuals were assessed with a visual analog pain scale and the Roland Morris functional disability questionnaire, at the time of the first and tenth treatment session. In total, 85.7% of the participants reported a decrease in the level of pain at the end of treatment, and 77.1% of the subjects recorded a lower score on the Roland Morris questionnaire.

Moreira and Soares [17] studied a group of five women aged between 20 and 30 years. The women were submitted to physical therapy to correct their posture, and to reduce the pain caused by postural abnormalities. The patients were radiographed one week after therapeutic discharge. The postural improvement was evidenced by the retraction of the shoulder. Despite the small number of patients, the radiographic image is a high point of the study. Based on this study, it is possible to see that some of the complaints of musculoskeletal pain may be related to postural problems. Rossi et al. [20] assessed

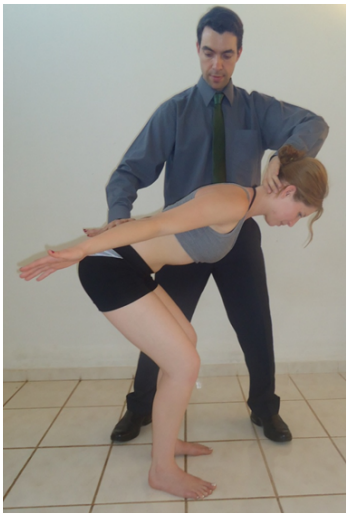

Figure 5: Shaktyasana–the shakty goddess pose.``

Figure 6: Dandasana–staff pose.

the effect of an application of the lying hip extension posture on 11 photographic postural variables. Of these variables, only 4 recorded significant improvements, and these four were all related to the head. Rosário et al. [24] obtained results in 3 of 6 variables with eight postural reeducation sessions, and there was no improvement in the shoulders and head. This highlights the fact that therapists place emphasis on postural correction, which may be more influential in a chosen segment. These studies revive the discussion, with a focus on posture and not on pain, about the time required for postural corrections and relief from the related pain. Rossi et al. [20] obtained the postural result with one posture, and the present study recorded pain reduction with one session and two postures.

Marques et al. [16] assessed the effect of postural treatment on fibromyalgia. Twenty patients that had been diagnosed with fibromyalgia were treated for six sessions on average. Of the 20 patients, 18 reported some improvement, and 65% rated it as excellent or good, whereas 25% reported it as fair and only 10% reported no improvement. Although fibromyalgia is listed as a rheumatologic disease, these data are similar to the results of the present study.

Basso et al. [12] decreased the pain of 20 patients with temporomandibular disorders, using 10 muscular chain treatment sessions. Gil et al. [14] decreased back pain in pregnant women in 8 weeks. Heredia and Rodrigues [26] relieved the pain of patients with epidural fibrosis in post-operative lumbar disc herniation with 15 sessions, also using analog scales.

Teodori et al. [27] conducted an interesting case study. Changes in plantar pressure distribution and the location of the center of force were assessed in a subject with a history of right ankle sprain, using a pressure platform, with free bipedal support and with the eyes open. Asymmetry was found in the distribution of plantar pressure applied to the subject in one postural reeducation session, and was followed by an assessment of the pressure platform, immediately after the intervention, and after 7, 14 and 30 days. The results clearly showed a recovery of symmetry, which continued for 7 days. After this period, there was a gradual recovery of asymmetry, although the initial values had not been attained after 30 days. Although a case study, if the data of this author is correct for the general population and most musculoskeletal pain is related to posture, one MCT session, as performed in the present study, would have the effect of pain resolution for seven days, and would remain in effect for 30 days or more, in cases of chronic pain.

do Rosario et al. [23] argue that this type of postural treatment technique does not act on posture simply by stretching, since a 15-minute posture provided similar results for hamstring flexibility, as a 30-second hamstring stretch. Body awareness and the active maintenance of better joint positioning, reducing an existing subluxation, can exert their influence on postural adjustment and consequently, solve related pain. Whatever the reason for the effect is, previous studies have shown that MCT causes a great improvement in the efficiency of a musculoskeletal pain source.

Conclusion

With the data obtained in the present study, it is possible to state that MCT, using modified yoga positions, is an efficient technique in terms of improving posture, reducing pain, and solving related musculoskeletal problems.

Further studies are required to understand how MCT, using modified yoga positions has the above impact, what musculoskeletel conditions that can be treated effectively by this method, as well as those that cannot, and the optimal time and frequency of application for each of these pathologies.

References

1. Rosário JLR, Marques AP, Maluf AS (2004) Clinical Aspects of Stretching: a literature review. Rev Bras Fisioter 8: 1-6.
2. James H, Castaneda L, Miller ME, Findley T (2009) Rolfing structural integration treatment of cervical spine dysfunction. J Bodyw Mov Ther 13: 229-238.
3. Kappler RE (1982) Postural balance and motion patterns. J Am Osteopath Assoc 81: 598-606.
4. Orchard J, Marsden J, Lord S, Garlick D (1997) Preseason hamstring muscle weakness associated with hamstring muscle injury in Australian footballers. Am J Sports Med 25: 81-85.
5. Bennell K, Wajswelner H, Lew P, Schall-Riaucour A, Leslie S, et al. (1998) Isokinetic strength testing does not predict hamstring injury in Australian Rules footballers. Br J Sports Med 32: 309-314.
6. Kendall FP, McCreary EK, Provance PG (2005) Muscles: Testing and Function with Posture and Pain, ed 5 (with Primal Anatomy CD-ROM). Phys Ther 86: 304-305.

7. Lee D (1994) Manual therapy for the thorax: DOPC, Vancouver.
8. Mirtz TA, Morgan L, Wyatt LH, Greene L (2009) An epidemiological examination of the subluxation construct using Hill's criteria of causation. Chiropr Osteopat 17: 13.
9. Teodori RM, Negri JR, Cruz MC, Marques AP (2011) Global Postural Re-education: a literature review. Rev Bras Fisioter 15: 185-189.
10. Rosário JLP (2011) Practical Manual of postural reeducation-What you need to know to effective treatment. Sao Paulo: Edn Baraúna.
11. Bertherat T, Bernstein C (1977) The Body Has Its Reasons: Self-Awareness Through Conscious Movement. New York: Pantheon Books.
12. Basso D, Correa E, da Silva AM (2010) Effect of global postural reeducation on body alignment and clinical condition of patients with temporomandibular disorders associated with postural deviations. Fisioter Pesq 17.
13. Canto CREM, Oliveira LF, Gobbi FCM, Theodoro MN (2010) Study of the effectiveness of the method of global postural reeducation in patients with low back pain in respect of pain and functional disability. Ter man 38: 292-297.
14. Gil VFB, Osis MJD, Faúndes A (2011) Low back pain during pregnancy: effectiveness of treatment with Global Postural Reeducation. Fisioter Pesqui 18: 164-170.
15. Luz GCP, Cheik NC, Ferreira F, Pereira PAC, Vidal JS, et al. (2008) Treatment of low back pain through the device lumbar-abdominal and global postural reeducation. Ter man 6: 287-292.
16. Marques AP, Mendonca LLF, Cossermelli W (1994) Stretching muscle in patients with fibromyalgia from a study of global postural reeducation. Bras J Rheumatol 34: 232-234.
17. Moreira CMC, Soares DRL (2007) Analysis of the effectiveness of global postural reeducation on protrusion on the shoulder after full recovery. Fisioter Mov 20: 93-99.
18. Moreno MA, Catay AM, Teodori RM, Borges BLA, Cesar MC, et al. (2007) Effect of a muscle stretching program using the Global Postural Re-education method on respiratory muscle strength and thoracoabdominal mobility of sedentary young males. J Bras Pneumol 33: 679-686.
19. Moreno MA, Catay AM, Teodori RM, Borges BLA, Zuttin RS, et al. (2009) Adaptations of the respiratory system related to lung function in response to a program of muscle stretching by the method of global postural reeducation. Fisioter resear 16: 11-15.
20. Rossi LP, Brandalize M, Gomes ARS (2011) Acute effect of global posture reeducation technique in the posture of women with anterior muscular chain shortening. Fisioter Mov 24: 255-263.
21. Myers TW (2009) Anatomy Trains. (2nd edn), Churchill Livingstone/Elsevier, Edinburgh.
22. Marques AP (2000) Muscular chains muscle-a program to teach global physical therapy evaluation. Manole, São Paulo.
23. do Rosário JLP, de Sousa A, Cabral CMN, João SMA, Marques AP (2008) Global posture reeducation and static muscle stretching on improving flexibility, muscle strength, and range of motion: a comparative study. Fisioter Pesq 15: 12-18.
24. Rosário JLP, Nakashima IY, Rizopoulos K, Kostopoulos D, Marques AP (2012) Improving posture: Comparing Segmental Stretch and Muscular Chains Therapy, Clin Chiropractic–in press.
25. Karminoff L (2007) Yoga Anatomy. Champaign IL–Human Kinetics.
26. Heredia EP, Rodrigues FF (2008) The treatment of patient with epidural fibrosis by global postural reeducation. Rev Bras Neurol 44: 19-26.
27. Teodori RM, de Oliveira Guirro EC, Santos RM (2005) Pressure distribution plant and location of center of force policy after the method global postural reeducation: a case study. Mov Fisioter 18: 27-35.