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Ocena czynników wpływających na skuteczność terapii integracji sensorycznej u dzieci w wieku przedszkolnym i wczesnoszkolnym

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Muscle energy techniques versus myofascial release on scoliosis in adolescent girls: A randomized controlled trial

Porównanie technik energetycznych mięśni i terapii uwalniania powięzi w leczeniu skoliozy u dziewcząt w wieku dojrzewania: Randomizowane badanie kontrolowane

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Abstract

Background. Adolescent idiopathic scoliosis (AIS) is a complicated 3D structural spine condition occurring in children aged 10 to skeletal maturity. The study aimed to examine the impact of muscle energy technique and/or myofascial release on adolescent idiopathic scoliosis for large sample. Also, it aimed to compare muscle energy techniques versus myofascial release in idiopathic scoliosis.
Methods. A total of 50 girls with idiopathic non-bony structural scoliosis of the thoracic spine were included in this trial. They were randomly divided into two equal-sized (n = 25 for each group). For three months, group A (Muscle energy technique Group), which received Scientific Exercises Approach to Scoliosis exercises in addition to Muscle energy technique; and group B (Myofascial release Group), which received the same Scientific Exercises Approach to Scoliosis exercises conducted to group A in addition to myofascial release. The primary outcome was a standing radiological evaluation of coronal Cobb´s angle.
Results. According to this study's findings, a highly significant difference was discovered in the mean values of Cobb´s angle between pre and post-treatment in muscle energy technique group. When the mean values of Cobb´s angle was compared before and after treatment for myofascial release group, it was reveals a significant change.
Conclusions. After treatment for three months, both groups improved significantly, with muscle energy technique group outperforming the myofascial release group by a large margin. So, muscle energy technique was more effective than myofascial release in reducing the abnormal thoracic curvature in adolescent idiopathic scoliosis.
Trial registration. The study was registered with Clinicaltrials.gov under the identifier NCT05120089.

Keywords

myofascial release, muscle energy technique, scoliosis

Streszczenie

Wprowadzenie. Idiopatyczna skolioza w okresie dojrzewania (AIS) to skomplikowana, trójwymiarowa strukturalna wada kręgosłupa występująca u dzieci w wieku od 10 lat do osiągnięcia dojrzałości kostnej. Celem badania było zbadanie wpływu technik energetycznych mięśni i terapii uwalniania powięzi na idiopatyczną skoliozę u dziewcząt w okresie dojrzewania na dużej próbie. Ponadto, celem było porównanie technik energetycznych mięśni z terapią uwalniania powięzi w leczeniu skoliozy idiopatycznej.
Metody. W badaniu wzięło udział 50 dziewcząt z idiopatyczną, nienabytą kostnie, strukturalną skoliozą kręgosłupa piersiowego. Zostały one losowo podzielone na dwie grupy po 25 osób każda. Przez trzy miesiące grupa A (Grupa technik energetycznych mięśni), która otrzymywała ćwiczenia według SEAS (Scientific Exercises Approach to Scoliosis) w połączeniu z technikami energetycznymi mięśni; oraz grupa B (Grupa terapii uwalniania powięzi), która otrzymywała te same ćwiczenia według Naukowego Podejścia do Skoliozy, co grupa A, w połączeniu z terapią uwalniania powięzi. Głównym wynikiem było stojące radiologiczne ocena kąta Cobba w płaszczyźnie czołowej.
Wyniki. Zgodnie z wynikami tego badania, odkryto bardzo znaczącą różnicę w średnich wartościach kąta Cobba przed i po leczeniu w grupie technik energetycznych mięśni. Porównując średnie wartości kąta Cobba przed i po leczeniu w grupie terapii uwalniania powięzi, ujawniono znaczącą zmianę.
Wnioski. Po trzech miesiącach leczenia, obie grupy wykazały znaczącą poprawę, przy czym grupa technik energetycznych mięśni osiągnęła znacznie lepsze wyniki niż grupa terapii uwalniania powięzi. Zatem techniki energetyczne mięśni były bardziej skuteczne niż terapia uwalniania powięzi w redukcji nieprawidłowej krzywizny piersiowej w idiopatycznej skoliozie u dziewcząt w wieku dojrzewania.
Rejestracja badania. Badanie zostało zarejestrowane w Clinicaltrials.gov pod identyfikatorem NCT05120089.

Słowa kluczowe

terapia uwalniania powięzi, techniki energetyczne mięśni, skolioza

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Introduction

Adolescent idiopathic scoliosis (AIS), is a 3-dimensional spinal deformity which has a minimal Cobb angle of 10º, is a lateral curvature with concurrent rotation of the spine of unknown cause. Scoliosis typically advances just before or during puberty affecting 2-3% of the ageing population [1-3]. As individuals get older, the female to male ratio rises significantly. The predominance of curves with higher Cobb angles are significantly greater in girls than in boys [4].

As the curve progresses, AIS also exhibits changes in the arranging and biomechanics of other segments that are detectable during a physical examination, such as changes in the posture of the shoulders, shoulder blades, and pelvis. These deviations are related to the increasing of the curve and may indicate that the musculature necessary to support these structures is compromised, either as a result of compensatory changes brought on by the deformity or from other causes [5].

In participants with scoliosis, the serratus anterior was more active and the inferior trapezius' concave side was less active. These results could be attributed to the three-dimensional modifications caused by scoliosis, which vary the posture of the shoulders [6].

Additionally, the hip flexor is stronger on the opposite side of the convexity of the curve than the hip extensor, which is stronger on the same side of the convexity of the curve [7]. Serratus anterior, trapezius distalis, trapezius medius, gluteus medius and quadratus lumborum on the convex side of the spinal curvature appeared to be weaker compared to concave side, and erector spine lumbalis, rhomboideus and multifidus on the concave side of the spinal curvature appeared to be weaker compared to convex side [5, 8-10].

The stability of the spinal system is aided by the posterior thoracolumbar fascia (PLF). Muscles linked to the PLF that are contracted may create tension, make the PLF stiffer, and alter the stability of the pelvis and lumbar spine [11].

Physical therapy is advised for curve magnitudes greater than 15° Cobb, according to current SOSORT (International Scientific Society on Scoliosis Orthopaedic and Rehabilitation Treatment) standards. Additionally, when curve magnitudes of 25–45° are visible, physical therapy and/or bracing are advised as conservative treatments for AIS. When curve magnitudes approach > 50°, surgical intervention for AIS is typically initially considered [12].

Physical therapy treatments attempt to increase range of motion, move joints and soft tissues, and reduce AIS-related muscle tone and pain [13]. Schroth exercises combine activities of daily living with rotational breathing for the purpose of promoting vertebral derotation and deflexion, which aim to repair spinal deformity. The patient's neurodynamic is encouraged to alter motor control by the exercises [14].

Asymmetrical stances are used in yoga poses to strengthen body by requiring arms, hips, or trunk muscles to work against one other [15]. By incorporating coordination, strength, and breathing exercises, the Pilates method was designed to promote mobility and overall physical wellbeing. The exercises include conscious trunk muscle utilization to balance out the lumbo-pelvic region [16,17].

In both static and dynamic activities, core stabilization enhances balance and posture control [18,19]. By releasing fascial limitations and enhancing the body's flexibility, myofascial release helps with posture, discomfort, and quality of life [20, 21]. Idiopathic scoliosis significantly improved with muscle energy technique (MET) [22, 23].

Rare studies were found to investigate either the impact of muscle energy technique or the influence of myofascial release on adolescent idiopathic scoliosis respectively. These studies were limited to one or two cases [20, 21]. Therefore, the purpose of our study was to examine the impact of the muscle energy method (MET) and/or myofascial release (MFR) on a large sample of adolescents with idiopathic scoliosis. Also, it aimed to compare muscle energy techniques versus myofascial release in idiopathic scoliosis.

Materials and methods

Study design

At outpatient physical therapy clinics, a single blinded randomized controlled design study was carried out in compliance with the ethical principles of the 1975 Helsinki Declaration. It lasted from November 2021 to January 2023. Our study was registered with Clinicaltrials.gov under the identifier NCT05120089.

Before conducting the study, the Faculty of Physical Therapy at Cairo University's ethics committee board accepted our procedures. All participants signed a consent form after hearing an explanation of the procedure. They are aware that they can withdraw their consent and quit taking part in the study at any time without harming the researchers.

Participants

Fifty teenage females with idiopathic non-bony structural scoliosis of the thoracic spine were randomly selected to participate in the study. All subjects were recruited from different secondary schools. They were chosen based on the following criteria:

All of the subjects were between the ages of 14 and 16, girls, with non-bony structural scoliosis. They had normal or healthy weight according to Centers for Disease Control and Prevention (CDC) growth charts for girls which ranged from Body mass index (BMI) for age 85th to 95th percentiles [24]. According to the widely accepted King's classification method, the scoliotic curve was a classification 3 (single primary thoracic curve) [10]. The degree of scoliosis (lateral spine deviation) ranged between 15° and 24°, as determined by the Cobb´s angle, via the use of a plane X- ray, from the standing position (stress X-ray). They were free from any associated deformities other than scoliosis.

Randomization

Sixty five girls with idiopathic non-bony structural scoliosis of the thoracic spine were evaluated for eligibility; eleven participants were omitted from the trial because they did not meet the inclusion criteria, and four patients refused to participate. As a result, fifty girls with idiopathic non-bony structural scoliosis of the thoracic spine were included in this trial. They were randomly divided into two equal-sized groups using random allocation software to reduce selection bias [25].

The girls were sorted into two equal groups at random through the Graph Pad Quick Calcs website [26] (n = 25 in each group); group A (Muscle energy technique Group), which received Scientific Exercises Approach to Scoliosis (SEAS)

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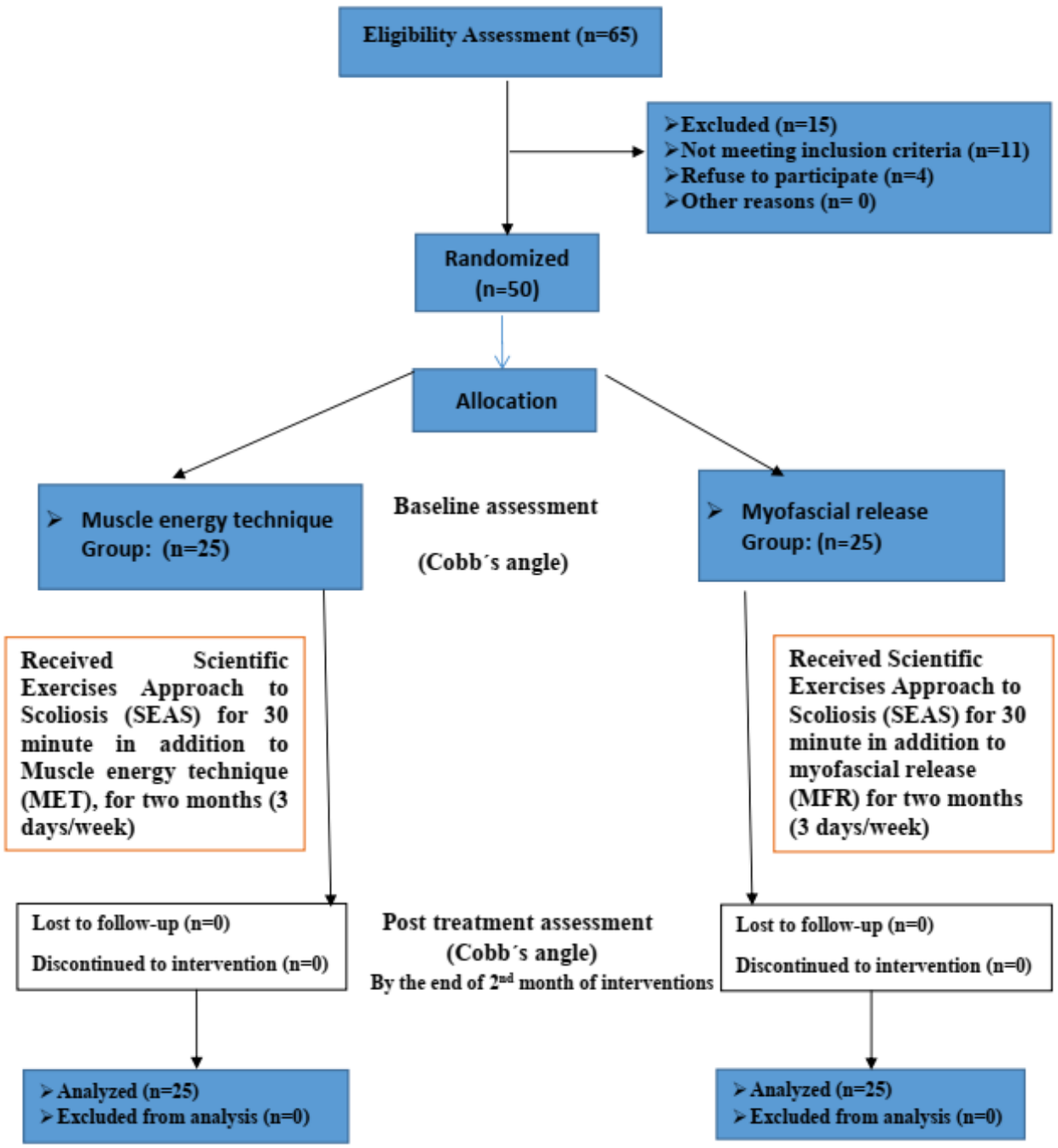

Figure 1. Flow chart

exercises in addition to Muscle energy technique (MET); and group B (Myofascial release group), which received the same Scientific Exercises Approach to Scoliosis (SEAS) exercises conducted to group A in addition to myofascial release (MFR). Figure (1) shows a representation showing patient retention and randomization throughout the research.

Outcome measures

All girls were assessed for the Cobb´s angle outcome at the baseline assessment and after three months of intervention. Each girl got a standing radiological evaluation of their coronal Cobb´s angle. Finding the vertebrae that were most inclined above and below the curve's apex was the initial stage. The Cobb´s angle was then calculated by comparing the tangents of the upper and lower endplates of the different vertebrae. A doctor or physiotherapist performed this measurement [27].

Interventions

Two groups received the following treatment by physiotherapist: group A (Muscle energy technique Group), which received SEAS exercises in addition to MET; and group B (Myofascial release Group), which received the same SEAS exercises conducted to group A in addition to MFR.

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Muscle energy technique Group (A): Scientific Exercises Approach to Scoliosis (SEAS) exercises in its 2002 version (2002: SEAS.02) according to the Italian Scientific Spine Institute (ISICO) approach for 30 minute in addition to Muscle energy technique (MET), for three months (3 days/week). Active Self-Correction is the foundation for the SEAS.02 exercises (ASC) [28].
Muscle energy technique were applied for the following muscles: rhomboideus on the convex side and serratus anterior, latissimus dorsi, trapezius distalis and trapezius medius on the concave side [5, 6, 8-10]. Muscle energy technique (MET) was applied for each muscle for 1 set of 5 repetitions with 10 sec hold [9, 29].
Myofascial release Group (B): the same SEAS exercise conducted to group A in addition to MFR for three months (3 days/week). Myofascial release techniques are characterized by light pressure that is maintained for at least 90 to 120 seconds. The patient received three 30-minute sessions of hands-on therapy every week. It was done from supine and prone positions. From supine position, MFR technique was bilateral lower extremity traction 5 min; diaphragm release 5 min; bilateral sustained pressure release of psoas 5 min; bilateral rib/sternum compression and rotation 3 min; and caudal release on sternum with cervical traction 4 min. From prone position: Thoracic spine release with caudal pressure 4 min and bilateral rib release with caudal pressure 5 min [20].
No obvious negative impacts were seen while the therapies were being used. Each participant was asked to describe any issues they were having, including as stiffness, increased muscular spasm, reduced range of motion, and radicular discomfort.

Power analysis
The proper sample size for this investigation was determined to be 25 subjects in each group using G*Power statistical software (version 3.1.9.2; Germany) prior to the trial.

Statistical analysis
Shapiro-Wilk and Levene's tests were utilized to evaluate the normality of the data distribution and homogeneity of variances, respectively. Unpaired t-test were conducted for comparison of the mean age (years), weight, height and Body mass index (BMI) and Cobb´s angle between the two groups. The statistical software for social science (SPSS) version 25 for Windows was used for all statistical calculations. Statistical significance was defined as a p-value < 0.05.
The data associated with the paper are not publicly available but are available from the corresponding author on reasonable request.

Results
In the pre-treatment, there is no significant variation in age (years), weight, height and Body mass index (BMI) and Cobb´s angle between the two groups ($p > 0.05$), Table (1). A highly significant difference was discovered in the mean values of Cobb´s angle between pre and post-treatment in Muscle energy technique Group (A) as the p-value is (0.001). When the mean values of Cobb´s angle was compared before and after treatment for Myofascial release Group (B), it was reveals a significant change, with a p-value of (0.01). The effect size was significant in Muscle energy technique Group (A) while effect size was medium in Myofascial release Group (B), Table (2).

Table 1. Pre-treatment mean value of age (years), weight, height and BMI and Cobb´s angle between group A & B

Item	Group A (n = 25)	Group B (n = 25)	Mean difference	t-value	p-value	Significance
	Mean ± standard deviation					
Age [year]	14.84 ± 0.72	14.95 ± 0.63	0.11	0.14	0.87	NS
Weight [kg]	52.81 ± 0.531	52.97 ± 0.497	0.16	0.13	0.89	NS
Height [cm]	161.90 ± 5.76	162.05 ± 5.3	0.15	0.14	0.88	NS
BMI	20.37 ± 2.13	20.56 ± 2.87	0.19	0.41	0.67	NS
Cobb´s angle	23.11 ± 1.83	22.68 ± 2.32	0.43	0.29	0.77	NS

NS: not significant. BMI: Body mass index

Table 2. Pre and post treatment mean value of Cobb´s angle for group A & B

Item	Group A		Group B	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Mean ± standard deviation	23.11 ± 1.83	19.18 ± 1.93	22.68 ± 2.32	20.49 ± 2.1.94
t-value	6.89		3.12	
p-value	0.0001**		0.01*	
Percentage of improvement	17%		9.66%	
Effect Size (Cohen's d)	1.378		0.624	

**: Significant. **: Highly significant*

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Discussion

Only a few research have looked into the effects of myofascial release or muscle energy approach on adolescent idiopathic scoliosis, respectively. Only one or two examples were included in these research [20, 23].Therefore, the purpose of our study was to examine the impact of MET and/or MFR on a large sample of adolescents with idiopathic scoliosis. Additionally, it compared the effects of myofascial release against muscle energy approaches on idiopathic scoliosis.

The most prevalent kind of idiopathic scoliosis, known as adolescent idiopathic scoliosis, affects subjects around puberty, when their spines are still developing. It is defined as a structural, lateral, rotational spinal curvature that develops in children. It affects more female than male [1-5, 30]. As a result, we decided to focus on adolescent females in school-age.

X-rays and CT scans are more accurate methods. These imaging methods are increasingly being used in clinical research to examine spinal mobility and assess patients' preoperative or postoperative conditions [31]. Measuring the changes of the scoliotic curve using Cobb´s angle come in agreement with Horng et al., [32] who stated that the Cobb´s angle which was first introduced by American orthopaedic physician John Robert Cobb, is the most used way to measure scoliosis. Measuring Cobb´s angle from standing position come in agreement with Soucacos et al., [33] who mentioned that scoliotic curve has higher Cobb´s angle in standing position than in supine position.

The pre-treatment results obtained from both groups (Muscle energy technique group and Myofascial release group) regarding the measuring variables showed no significant difference. The outcomes of this study revealed a highly significant reduction in Cobb´s angle in Muscle energy technique group. It also represent a significant reduction in Cobb´s angle in Myofascial release group. The percentage of the reduction of the Cobb´s angle muscle energy technique group and myofascial release group was 17% and 9.66% respectively. It shown that MET has a highly significant effect on the scoliotic curve as compared to MFR.

Our outcomes are consistent with those of LeBauer et al., [19] who examined the role of MFR in the management of an idiopathic scoliosis case. According to their findings, the subject's pulmonary function, quality of life, posture, and pain levels all improved after received MFR in the management.

In the at-risk, skeletally immature patient with teenage idiopathic scoliosis described in the study of three cases, the prospective effects of chuna treatment and MFR on back pain and curve reduction were demonstrated. Each scoliosis condition required a three-month corrective regimen. To treat the scoliosis issues, Chuna Therapy and MFR were administered once a week, along with additional eastern medicine treatments administered twice a week. Before and after the treatments, the Cobb's angle was measured using an X-ray with a full spine view. Following the programme, Cobb's angle fell [20].

Also, the results of our study come in agreement with Lee et al., [21, 22] who study the impact of the MET on patients of idiopathic scoliosis. Visual analog scale, correctability, and Cobb's angle were discovered to have greatly improved following MET.

Reduction of the abnormal thoracic curvature in adolescent idiopathic scoliosis could be attributed to the combined effects of SEAS with muscle energy technique or myofascial release. SEAS depends on self-correction and stabilization. It might be related to the fact that workouts can only influence behavioural and instinctive changes in movement and posture via various motor control techniques. This is especially significant for a physical system like the trunk and spine, which have been shown to be driven by automated, feed-forward mechanisms rather than deliberate control. Furthermore, active mobility is more beneficial than passive placement in detecting spinal deformity alterations [34].

Also, muscle energy technique decreases sympathetic tone through fascial stimulation and localized vasodilatation [35, 37]. Additionally, it promotes agonist-receiving muscle inhibition [36, 37]. Effects of myofascial release were underlying by different concepts. The MFR's therapeutic usage is predicated on the tight-loose idea. This tight-loose idea has both biomechanical and neuronal reactive components. Also, there is a role of the palpation in myofascial pain syndromes. Some of the symptoms associated with myofascial pain are likely mediated by reflexes of the sympathetic nervous system, which appears to play a key role in the autonomic nervous system's role in mediating myofascial sensitivity [38, 39].

When manual force is applied to the musculoskeletal system during myofascial release, neuroreflexive change takes place. The hands-on method uses receptors to provide afferent stimulation; a response requires central processing at the spinal cord and cortical levels. Efferent inhibition typically follows afferent activation. When the afferent stimulation of a stretch is performed, this principle is utilized in the MFR technique while the operator waits for efferent inhibition to happen so that relaxation ensues in tight tissue [38, 39].

In the MFR concept, release refers to the tissue's ability to relax when a suitable amount of tissue stress has been applied. Under the application of the load, the tightness "gives way" or melts. Release turns into an enabling and last goal of MFR application. The goal is to produce improvement in the symmetry of form and function [38, 39].

This study has some limitations. First, the psychological component of the girl's rehabilitation that may influence the metrics of success hasn't been looked at. Secondly, the analysis for pulmonary functions and anterior trunk rotation angle has not been investigated in this study.

Conclusion

After treatment for three months, muscle energy technique and myofascial release groups improved significantly, with muscle energy technique group outperforming the myofascial release group by a large margin. So, Muscle energy technique was more effective than myofascial release in reducing the abnormal thoracic curvature in adolescent idiopathic scoliosis.

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Piśmiennictwo/ References

1. Bunge E, Habbema J, de Koning H. A randomised controlled trial on the effectiveness of bracing patients with idiopathic scoliosis: failure to include patients and lessons to be learnt. European Spine Journal. 2010; 19(5):747-753.
2. Abdel Ghafar M, Abdelraouf O, Abdel-aziem A, Elnegamy T, et al. Pulmonary Function and Aerobic Capacity Responses to Equine Assisted Therapy in Adolescents with Idiopathic Scoliosis: A Randomized Controlled Trial. Journal of Rehabilitation Medicine. 2022; 54:jrm00296.
3. Białek M. Conservative treatment of idiopathic scoliosis according to FITS concept: presentation of the method and preliminary, short term radiological and clinical results based on SOSORT and SRS criteria. Scoliosis. 2011; 6(1).
4. Konieczny M, Senyurt H, Krauspe R. Epidemiology of adolescent idiopathic scoliosis. Journal of Children's Orthopaedics. 2013; 7(1):3-9.
5. Alves D, Araújo B. Muscle disorders in adolescent idiopathic scoliosis: literature review. Coluna/Columna. 2016; 15(1):73-77.
6. Zabjek K, Leroux M, Coillard C, Prince F, et al. Postural Characteristics of Adolescents With Idiopathic Scoliosis. Journal of Pediatric Orthopaedics. 2008; 28(2):218-224.
7. Cheung J, Veldhuizen A, Halberts J, Sluiter W, et al. Geometric and Electromyographic Assessments in the Evaluation of Curve Progression in Idiopathic Scoliosis. Spine. 2006; 31(3):322-329.
8. Liang R, Yip J, Fan Y, Cheung J, et al. Electromyographic Analysis of Paraspinal Muscles of Scoliosis Patients Using Machine Learning Approaches. International Journal of Environmental Research and Public Health. 2022; 19(3):1177.
9. Sarcevic Z. Scoliosis: muscle imbalance and treatment. British Journal of Sports Medicine. 2010; 44(Suppl_1):i16-i16.
10. Curtin M, Lowery MM. Musculoskeletal modelling of muscle activation and applied external forces for the correction of scoliosis. Journal of NeuroEngineering and Rehabilitation. 2014;11(1):52.
11. Huang Q, Zhang L, Li Z, Kong L. Manual therapy for idiopathic scoliosis. Medicine. 2020; 99(34):e21782.
12. Abbott A, Möller H, Gerdhem P. CONTRAIS: Conservative Treatment for Adolescent Idiopathic Scoliosis: a randomized controlled trial protocol. BMC Musculoskeletal Disorders. 2013; 14(1).
13. Weiss H, Lehnert-Schroth C, Moramarco M. Schroth therapy. Germany: LAP Lambert Academic Publishing; 2015.
14. Monroe M, Fishman L. Yoga and scoliosis. New York: Demos Health; 2011.
15. Rydeard R, Leger A, Smith D. Pilates-Based Therapeutic Exercise: Effect on Subjects With Nonspecific Chronic Low Back Pain and Functional Disability: A Randomized Controlled Trial. Journal of Orthopaedic & Sports Physical Therapy. 2006; 36(7):472-484.
16. Segal NA, Hein J, Basford JR. The effects of pilates training on flexibility and body composition: An observational study. Archives of Physical Medicine and Rehabilitation. 2004; 85(12):1977–81.
17. Akuthota V, Nadler SF. Core strengthening. Archives of Physical Medicine and Rehabilitation. 2004; 85:86–92.
18. Muthukrishnan R, Shenoy SD, Jaspal SS, Nellikunja S, et al. The differential effects of core stabilization exercise regime and conventional physiotherapy regime on postural control parameters during perturbation in patients with movement and Control Impairment Chronic Low Back pain. BMC Sports Science, Medicine and Rehabilitation. 2010; 2(1).
19. Ayhan C, Unal E, Yakut Y. Core stabilisation reduces compensatory movement patterns in patients with injury to the ARM: A randomized controlled trial. Clinical Rehabilitation. 2013; 28(1):36–47.
20. LeBauer A, Brtalik R, Stowe K. The effect of myofascial release (MFR) on an adult with idiopathic scoliosis. Journal of Bodywork and Movement Therapies. 2008; 12(4):356–63.
21. Hee-Guen J, Sang-Young L, Sae-Hyuk H, Jun Hyuk S, et al. Chuna therapy and myofascial release technique for the pain relief and Cobb's angle improvement in patients with adolescent idiopathic scoliosis: case report. The Journal of Korea CHUNA Manual Medicine for Spine and Nerves. 2013; 8(2):87–95.
22. Lee S-J, Park J-H, Nam S-H, Kang J-H. A Clinical Case of Muscle Energy Technique and Schroth Method for Idiopathic Scoliosis. Korean Med Rehab. 2014; 24(3):173–9.
23. Sung-Joon L, Hyuk-Jae L, Yu-Jin L. Two cases of idiopathic scoliosis with double curved thoracolumbar spine using muscle energy technique. The Journal of Korea CHUNA Manual Medicine for Spine and Nerves. 2017; 12(2):63–71.
24. MB; HMAP. Interpreting weight, height, and body mass index percentiles in the US Centers for Disease Control and Prevention Growth Charts-reply [Internet]. JAMA pediatrics. U.S. National Library of Medicine; [cited 2022Aug29]. Available from: https://pubmed.ncbi.nlm.nih.gov/35188548/
25. Saghaei M. Random allocation software for parallel group Randomized Trials. BMC Medical Research Methodology. 2004; 4(1).
26. Graphpad software inc. Retrieved from http://www.Graphpad.com/quickcalcs/rand mizel.cfm, 2017.
27. Liang R, Yip J, Fan Y, Cheung JP, et al. Electromyographic analysis of paraspinal muscles of scoliosis patients using machine learning approaches. International Journal of Environmental Research and Public Health. 2022; 19(3):1177.
28. Negrini S, Zaina F, Romano M, Negrini A, et al. Specific exercises reduce brace prescription in adolescent idiopathic scoliosis: A prospective controlled cohort study with worst-case analysis. Journal of Rehabilitation Medicine. 2008; 40(6):451–5.
29. Zaidi F, Ahmed I. Effectiveness of Muscle Energy Technique as compared to Maitland mobilizations for the treatment of chronic sacroiliac joint dysfunction. Journal of the Pakistan Medical Association. 2020; 1.
30. Struber L, Nougier V, Griffet J, Daniel O, et al. Comparison of trunk motion between moderate AIS and Healthy Children. Children. 2022; 9(5):738.
31. Topalidou A, Tzagarakis G, Souvatzis X, Kontakis G, et al. Evaluation of the reliability of a new non-invasive method for assessing the functionality and mobility of the spine. Acta Bioeng Biomech Wroclaw Univ Technol. 2014; 16(1):117–24.
32. Horng M-H, Kuok C-P, Fu M-J, Lin C-J, et al. Cobb angle measurement of spine from x-ray images using convolutional neural network. Computational and Mathematical Methods in Medicine. 2019; 2019:1–18.
33. Soucacos PK, Soucacos PN, Beris AE. Scoliosis elasticity assessed by manual traction: 49 juvenile and adolescent idiopathic cases. Acta Orthopaedica Scandinavica. 1996; 67(2):169–72.
34. Romano M, Negrini A, Parzini S, Tavernaro M, et al. SEAS (Scientific Exercises Approach to Scoliosis): a modern and effective evidence based approach to physiotherapic specific scoliosis exercises. Scoliosis [Internet]. 2015 Feb 5 [cited 2019 Jun 12];10(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4344739/
35. Schleip R. Fascial plasticity – a new neurobiological explanation: Part 1. Journal of Bodywork and Movement Therapies. 2003; 7(1):11–9.
36. Lewit K. Manipulative therapy in rehabilitation of the motor system. 3rd. London, UK: Butterworth-Heinemann; 1999.
37. Sbardella S, La Russa C, Bernetti A, Mangone M, et al. Muscle Energy Technique in the rehabilitative treatment for acute and chronic non-specific Neck Pain: A systematic review. Healthcare. 2021; 9(6):746.
38. DeStefano LA, Greenman PE. Greenman's principles of Manual Medicine. 5th ed. Philadelphia: Wolters Kluwer; 2016.
39. Shah S, Bhalara A. Myofascial Release. International Journal of Health Sciences & Research (wwwijhsrorg). 2012; 2(2):69–77.

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