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TBC SYSTEM FOR LOW LOW BACK PAIN IN A PATIENT WITH DISCOPATHY AND SPONDYLOARTHROSIS: CASE REPORT

SISTEMA TBC PARA DOR LOMBAR EM PACIENTE COM DISCOPATIA E ESPONDILOARTROSE: RELATO DE CASO

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Abstract: Introduction: Low back pain (LBP) is considered as a heterogeneous group of musculoskeletal disorders, affecting approximately 65-85% of the world population. There are four classification systems for primary LBP that attempt to combine treatments for subgroups of patients. Only TBC proved to be more effective for the classification system in subgroups of patients with LBP. The aim of this case report was to explore the efficacy of treatment in subgroups, according to TBC, for a patient with LBP and the symptoms generated by herniated discs and spondyloarthrosis. **Case report:** male, 54 years old, black, married, sedentary, construction foreman. She was diagnosed with lumbar spondyloarthrosis and degenerative lumbar discopathy with disc bulges in T12-L1, L3-L4 and L4-L5, in August 2021. The main complaint was: LPB. **Results:** strength (initial MRC: 4, final: 5); increased ROM for lumbar spine movements; pain intensity (VAS: initial: 8, final: 0); Schober's test (initial: 13cm, final: 16cm); improvement in all aspects assessed by the SF-36 questionnaire; ODI (initial: 58%, final: 18%). **Discussion:**

Subgroup-compatible treatment approaches showed better results compared to non-compatible alternative methods, corroborating the results of this study. **Conclusion:** it was found that an approach based on TBC and individualized in patients with LBP, presents effective results in improving pain, functional disability and quality of life.

Keywords: Low Back Pain; Subgroups; TBC; ODI; SF-36.

INTRODUCTION

Low back pain (LD) is considered as a heterogeneous group of musculoskeletal disorders that affects about 65-85% of the world's population, being one of the main causes of pain, functional and work disability[1]. More than 90% of people who have already had LD are prone to relapses, which affects almost all individuals at some point in their lives, representing a great weight for the health and social care systems[1-2]. Among patients with LD, herniated discs are one of the most present musculoskeletal disorders, affecting approximately 10% of the population[2-3]. The prevalence is higher in men and most individuals are between 30 and 50 years of age. Herniated discs appear more frequently in the lumbar region than in any other region and are more common at L4-L5 and L5-S1 levels. It is noteworthy that root pain is one of the most common and disabling symptoms, and can cause sensory and motor deficits and leave the person disabled[2].

Another problem that can also lead to LD is spondyloarthrosis, a chronic, rheumatic and inflammatory disease that results in structural deformity and limitation of spinal mobility by affecting the axial skeleton[4]. Spondyloarthrosis includes two distinct but interrelated pathologies: spondylosis or disc degenerative disease and osteoarthritis of the posterior interapophyseal joints[4-5]. It has as main clinical characteristics: fatigue, inflammatory pain in the back and joint stiffness. It can lead to structural and functional deficiencies, consequently, it also results in a reduction in general health, functional capacity and quality of life[5].

There are four classification systems for primary DL that try to combine treatments for subgroups of patients using a clinically guided decision-making process[1]: (1) the mechanical diagnosis and therapy classification model described by McKenzie[6]; (2) the deficiency syndrome model of the motion system described by Sahrmann[7]; (3) the mechanism-based classification system described by O'Sullivan[8]; and (4) the treatment-based classification system (TBC), described by Delitto et al. [9]. However, only TBC was more effective for the treatment classification system in subgroups of patients with LD [1].

Since its publication in 1995, TBC has gone through development phases that have been largely based on increasing evidence[9]. A review of the TBC was published in 2007 with the aim

of updating the 1995 TBC with the most recent evidence that emerged between 1995 and 2007, representing the second phase of development[10]. And in 2015 the TB system received an update, representing the third phase of development, being conducive due to advances in the way care is provided to patients with DL[1].

TBC is considered the most researched DL classification system, with several studies that investigate its usefulness as a guide for clinical decision-making[1], so it was used in decision-making for this clinical case in the treatment of LD of this patient. Therefore, the objective of this case report was to explore the effectiveness of treatment in subgroups, according to TBC, for a patient with LD and the symptoms generated by herniated discs and spondyloarthrosis.

CASE REPORT

Male patient, 54 years old, black, married, sedentary, in charge of works, resident of the city of Muritiba - BA. He was diagnosed with lumbar spondyloarthrosis and lumbar degenerative discopathy with disc bulges in T12-L1, L3-L4 and L4-L5, in August 2021.

The main complaint was pain in the lumbar region. The patient reported that six years ago he felt pain in the lumbar region, being an intermittent pain, however, two years ago it became constant and more intense. This pain also began to radiate to the thoracic, sacral and anterior regions of the right and left thighs, presenting the following characteristics: burning, stings and tingling. The patient also reported that, before the medication, he could not sleep at all at night and that the pain relieves only with the use of medications.

The clinical characteristics found in the patient were: continuous pain in the thoracic, lumbar and sacral region with bilateral irradiation to the anterior face of the thighs; positive orthopedic tests: Valsava, Lasegue, Lasegue crossed test, Roover and Schober; worsening of pain in the movement for flexion; presence of spasms of the paravertebral muscles; change in sensitivity (paresthesia); decrease in strength for flexors and abductors of the hip, knee extensors and glutes (grade 4 on the MRC scale); decrease in the range of motion of the lumbar spine; antalgic posture; difficulty in performing activities of daily and instrumental life; and made use of anti-inflammatory, analgesics and relaxants Muscular.

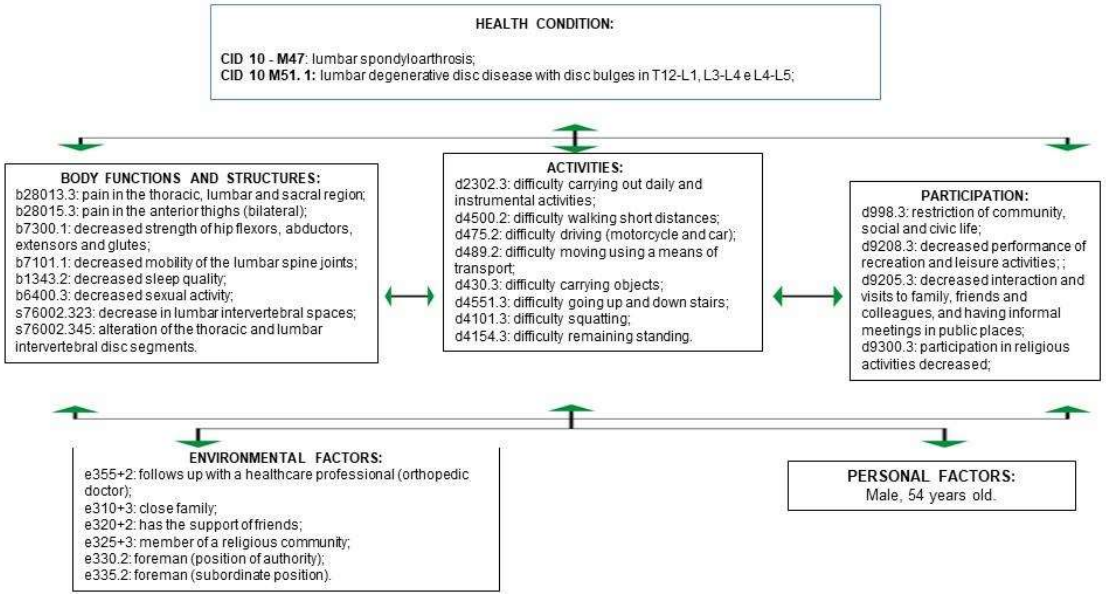
The participant was evaluated and treated at the School Clinic of the Adventist College of Bahia, in Cachoeira, Bahia, and signed the free and informed consent form (TCLE). The study followed resolution 196/96 of the National Health Council for study in human beings.

After the anamnesis and physical examination, the SF-36 Quality of Life Questionnaire and the Oswestry Disability Index were applied. The SF-36 (Medical Outcomes Study 36 - Item Short - Form Health Survey) is a general quality of life assessment tool, easy to administer and understand. Being a multidimensional questionnaire composed of 36 items, classified into 8

(eight) scales or domains, which are: functional capacity, physical aspects, pain, general state of health, vitality, social aspects, emotional aspects and mental health[11]. The Oswestry Disability Index (ODI) is a disease instrument - specific for the evaluation of spinal disorders. The scale consists of 10 questions with six alternatives, the value varies from 0 to 5. The first question evaluates the intensity of pain and another nine evaluate the effect of pain on activities such as personal care, weight lifting, walking, sitting, standing, sleeping, in your sexual, social and locomotion life[12].

The International Classification of Functionality, Disability and Health (ICF) system was also used, developed by the World Health Organization (WHO), thinking about a biopsychosocial evaluation of the patient[13].

Figure 1 – Interaction between the components of the ICF. Initial assessment:



Source: Data from the study adapted from the ICF model, WHO 2008.

In the classification of the patient into subgroups through TBC[1], initially the patient underwent screening to determine the most appropriate management approach. Because it presents a low state of psychosocial risk with predominant leg pain and minor or controlled medical comorbidities, it was decided by rehabilitation management. Then the most appropriate rehabilitation approach was determined. The patient's stage was focused on the modulation of symptoms, due to the presentation of high deficiency, status of volatile symptoms and high to moderate pain. From this, the patient moved on to the classification of subgroups of treatments: exercises of directional preference; manipulation/mobilization; traction; and stabilization.

Due to the signs and symptoms presented by the patient, he was classified in the subgroup for exercises of directional preference for extension. This is because it presented symptoms that

centralized with lumbar extension and peripherized with flexion and directional preference for extension (dorsial decubitus).

The treatment was divided into 15 consultations, with two weekly sessions. In the first phase, with the therapeutic objective of relieving symptoms, the following was performed: electrotherapy (Transcutaneous Electrical Neurostimulation - TENS and Interferential Current[14]; myofascial thoracolombosacral release[15]; mobilization of the spine with the movement of the leg[3]; exercises of directional preference for extension[1]; and education in pain[10].

In the second phase, which aims at the relief of symptoms and the rapid return to functions, the following conducts were performed: thoracolombosacral myofascial release; thoracic joint manipulation; stretching of the lumbar square and the muscles of the lower limb[15]; mobilization of the spine with the movement of the leg[3]; exercises of directional preference for extension[1]; and education in pain[10].

In the third phase, which aimed to return to activities of high physical demand and prevention of relapses of LD, it was carried out: stretching of the lumbar square and the muscles of the lower limbs; resistance training for flexors, abductors, internal and external rotators of the hip; resistance training for knee extensors[15-16]; pain education[10]; aerobic exercises[16]; and exercises of directional preference for extension[1].

The exercises of directional preference for extension were included in all phases of treatment and were performed in all sessions. The patient received all the necessary guidance to perform them at home.

RESULTS

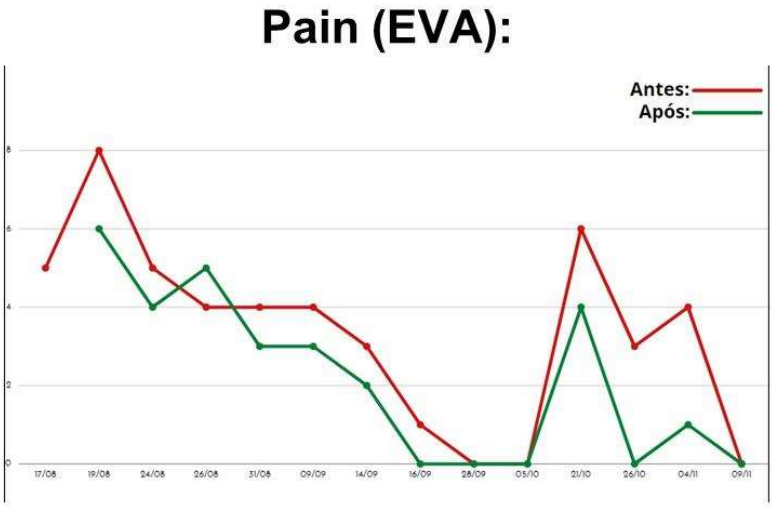
Table 1 - Description of the results before and after the interventions.

Variables	Initial	Final	Diference (%)
Force (MRC)			
Hip flexors	4	5	20%
Knee extensors	4	5	20%
Hip abductors	4	5	20%
Glutes	4	5	20%
Pain (EVA)	8	0	-100%

ROM (lumbar spine)			
Flexion	78°	93°	19,23%
Extension	25°	35°	40%
Right side tilt	20°	36°	80%
Left side tilt	30°	40°	33,3%
Rotation to the right	20°	35°	75%
Rotation to the left	18°	32°	77,7%
Schober Test	13 cm	16 cm	23,07%

Source: research data.
MRC: Medical Research Council; ROM: range of motion; VAS: visual analogue scale;

Figure 2 – Assessment of pain intensity through VAS before and after care/interventions.



Source: research data.

Figure 3 – Assessment of quality of life using the initial and final SF-36.
Source: research data.

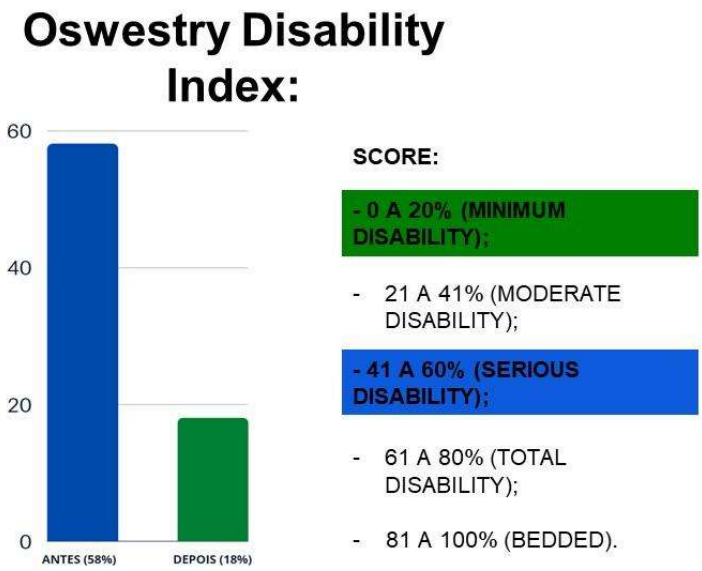
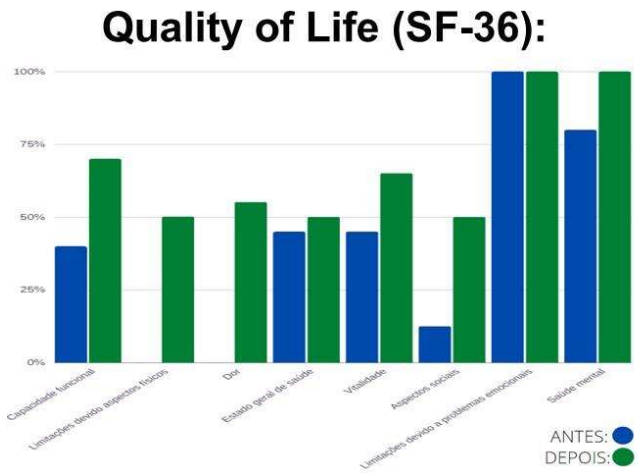
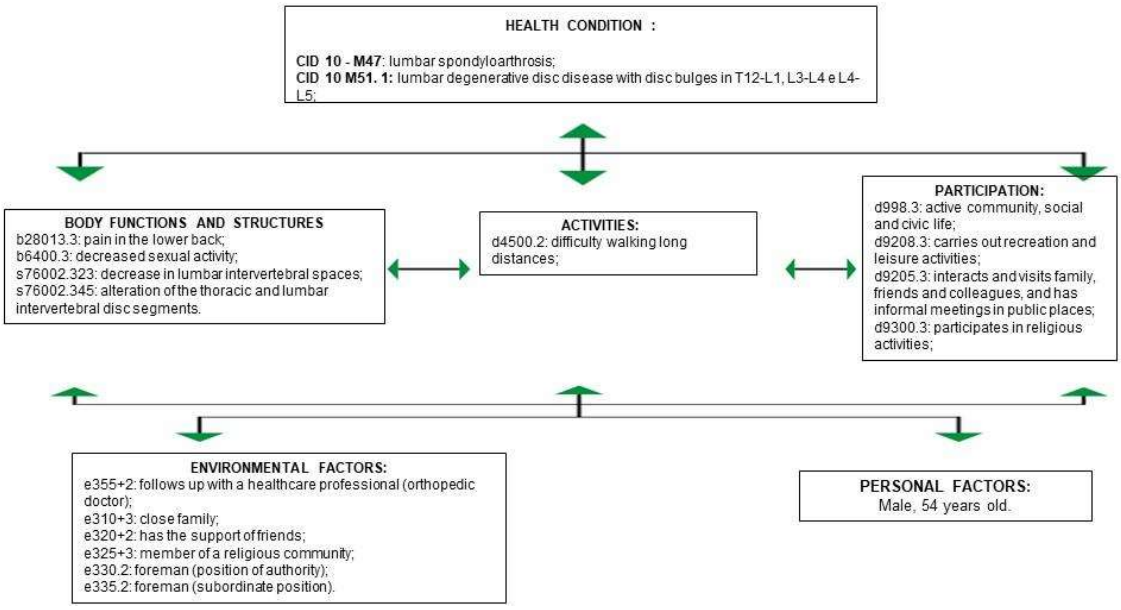


Figure 4 – Initial and final assessment using the Oswestry Disability Index.



Source: research data.
Note: values closer to 0% represent less disability

Figure 5 – Interaction between the components of the ICF. Final evaluation:



Source: Data from the study adapted from the ICF model, WHO 2008.

DISCUSSION

Several studies have shown the effectiveness of various techniques in improving pain, functional capacity and quality of life of individuals with LD, such as manual therapy techniques, electrotherapy, physical exercise, among others[2]. However, despite the abundance of research on DL, clinical trials did not provide conclusive evidence to support the superiority of any specific intervention[1,17-18].

This fact is attributed to what is carried out in most clinical trials that include the application of a single intervention to a heterogeneous group of patients with LD. This heterogeneity, combined with broad inclusion criteria, tends to decrease the effect of treatment[17-18]. A suggestion to improve the effect of the treatment of patients with LD, these should be classified into homogeneous subgroups and paired for a specific treatment according to signs, symptoms and level of disability presented[1].

Treatment approaches compatible with subgroups showed better results compared to non-compatible alternative methods[1,17], corroborating the results of this study that found improvement in pain, functional disability and quality of life, in addition to strength and ROM, of a patient with LL. Results that demonstrate the importance of clinical decision-making according to the best methods available for the treatment of LD.

The ICF is an important parameter for the evaluation and reassessment of patients, since cases can be reclassified[13]. The use of the ICF aimed to add the evaluation scales that were used

in this patient with LD, being a tool for description and systematized understanding of the evaluation and reassessment of the patient. Through the classification of the patient with the ICF, an improvement in the biopsychosocial aspects can be observed after the interventions. In the case of spondyloarthrosis, a systematic Cochrane review, published in 2019, showed that there is only evidence of good and low quality that exercise programs may or may not have an effect on improving function and reducing pain in patients with ankylosing spondylitis. There is therefore no certainty that spinal mobility exercise programs reduce fatigue or induce undesirable effects on these patients[19]. These uncertainties about exercise programs for patients with spondyloarthrosis may have contributed to the worsening of the intensity of the patient's pain during treatment, in addition to known recurrences of LD.

Pain education is considered one of the pillars of the treatment of patients with chronic pain[10]. A systematic review of multidisciplinary interventions for chronic pain showed that education in the intervention environment seems to give good results. Topics about physical activity and cognitive-behavioral strategies were the most used. Most of the included studies offered written material and homework for participants to review the content, according to their preference[10]. All these pain education strategies were included in all the care of this patient.

CONCLUSION

Based on the results of this clinical case, it was found that a personalized approach to TBC for the patient with LD led to effective results in reducing pain, functional disability and improvement in quality of life. However, the data need to be validated through studies with representative samples. It is worth noting that this technique is low cost, has a low risk of complications and can be considered a viable alternative to surgical interventions. In summary, a scientifically based therapeutic approach to the management of LD is highly significant in the clinical context.

REFERENCES

1. Alrwaily M, Timko M, Schneider M, Stevans J, Bise C, Hariharan K, Delitto A. Treatment-Based Classification System for Low Back Pain: Revision and Update. Physical Therapy. 2016;96(7):1057–1066. Disponível em: https://academic.oup.com/ptj/article/96/7/1057/2864925. Acesso em: 05 nov. 2021.

2. Singh V, Malik M, Kaur J, Kulandaivelan S, Punia S. A systematic review and meta-

analysis on the efficacy of physiotherapy intervention in management of lumbar prolapsed intervertebral disc. Int J Health Sci. 2021;15(2):49-57. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7934127/ Acesso em: 05 nov. 2021.

3. Satpute K, Hall T, Bisen R, Lokhande P. The Effect of Spinal Mobilization With Leg Movement in Patients With Lumbar Radiculopathy-A Double-Blind Randomized Controlled Trial. Arch Phys Med Rehabil. 2019;100(5):828-836. Disponível em: https://www.archives-pmr.org/article/S0003-9993(18)31509-0/fulltext. Acesso em: 05 nov. 2021.

4. Zdrodowska B, Leszczyńska-Filus M, Leszczyński R, Błaszczyk J. The influence of laser therapy on selected functional parameters of patients with spondyloarthrosis of the lower section of the spine. Pol Merkur Lekarski. 2014;36(212):101-5. Disponível em: https://pubmed.ncbi.nlm.nih.gov/24720105/ Acesso em: 05 nov. 2021.

5. Batur EB, Karataş GK. Do postural changes affect balance in patients with ankylosing spondylitis? J Rehabil Med. 2017;49(5):437-440. Disponível em: https://www.medicaljournals.se/jrm/content/abstract/10.2340/16501977-2230 Acesso em: 05 nov. 2021.

6. Sahrmann S. Diagnosis and treatment of movement impairment syndromes. Elsevier Health Sciences. 2017. Disponível em: https://www.sciencedirect.com/science/article/abs/pii/S1413355517303660?via%3Dihub. Acesso em: 05 nov. 2021.

7. O'Sullivan P. Diagnosis and classification of chronic low back pain disorders: maladaptive movement and motor control impairments as underlying mechanism. Manual therapy. 2005;10(4):242-255. Disponível em: https://www.sciencedirect.com/science/article/abs/pii/S1356689X05001104?via%3Dihub. Acesso em: 05 nov. 2021.

8. Delitto A, Erhard RE, Bowling RW. A treatment-based classification approach to low back syndrome: identifying and staging patients for conservative treatment. Physical therapy. 1995;75(6):470-485. Disponível em: https://academic.oup.com/ptj/article-abstract/75/6/470/2632889?redirectedFrom=fulltext. Acesso em: 05 nov. 2021.

9. Fritz JM, Cleland JA, Childs JD. Subgrouping patients with low back pain: evolution of a classification approach to physical therapy. Journal of orthopaedic & sports physical therapy. 2007;37(6):290-302. Disponível em: https://www.jospt.org/doi/10.2519/jospt.2007.2498?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed. Acesso em: 05 nov. 2021.

10. Joypaul S, Kelly F, McMillan SS, King MA. Multi-disciplinary interventions for chronic pain involving education: A systematic review. PLoS One. 2019;14(10):e0223306. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6774525/. Acesso em: 05 nov. 2021.

11. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma MR. Tradução para a língua portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36 (Brasil SF-36). Rev. bras. reumatol.. 1999;39(3):143-50. Disponível em: http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IsisScript=iah/iah.xis&scr=google&base=LILACS&lang=p&nextAction=lnk&exprSearch=296502&indexSearch=ID. Acesso em: 05 nov. 2021.

12. Vigatto R, Alexandre NM, Correa Filho HR. Development of a Brazilian Portuguese version of the Oswestry Disability Index: cross-cultural adaptation, reliability, and validity.

Spine. 2007;15;32(4):481-6. Disponível em: https://journals.lww.com/spinejournal/Abstract/2007/02150/Development_of_a_Brazilian_Portuguese_Version_of.16.aspx. Acesso em: 05 nov. 2021.

13. Organização Mundial da Saúde. CIF: Classificação Internacional de Funcionalidade, Incapacidade e Saúde [Centro Colaborador da Organização Mundial da Saúde para a Família de Classificações Internacionais]. São Paulo: Editora da Universidade de São Paulo – EDUSP. 2008. Disponível em: https://apps.who.int/iris/bitstream/handle/10665/42407/9788531407840_por.pdf?sequence=111&isAllowed=y. Acesso em: 05 nov. 2021.

14. Pereira DSL. Eletrotermofototerapia. 1 ed. Rio de Janeiro: SESES; 2017. 136 p.

15. Kisner C, Colby LA. Exercícios Terapêuticos, fundamentos e técnicas. 6 ed. Barueri – SP: Manole; 2016. 1058 p.

16. Wewege MA, Booth J, Parmenter BJ. Aerobic vs. resistance exercise for chronic non-specific low back pain: A systematic review and meta-analysis. J Back Musculoskelet Rehabil. 2018;31(5):889-899. doi: 10.3233/BMR-170920. PMID: 29889056.

17. Hayden JA, van Tulder MW, Malmivaara AV, Koes BW. Meta-analysis: exercise therapy for nonspecific low back pain. Ann Intern Med. 2005;142:765–775. Disponível em: https://www.acpjournals.org/doi/10.7326/0003-4819-142-9-200505030-00013?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed. Acesso em: 05 nov. 2021.

18. Hayden JA, van Tulder MW, Tomlinson G. Systematic review: strategies for using exercise therapy to improve outcomes in chronic low back pain. Ann Intern Med. 2005;142:776–785. Disponível em: https://www.acpjournals.org/doi/10.7326/0003-4819-142-9-200505030-00014?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed. Acesso em: 05 nov. 2021.

19. Vibe Fersum K, O'Sullivan P, Skouen JS, et al. Efficacy of classification-based cognitive functional therapy in patients with non-specific chronic low back pain: a randomized controlled trial. Eur J Pain [internet]. 2013;17:916–928. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3796866/. Acesso em: 05 nov. 2021.