



REPERCUSSION OF THE PILATES METHOD ON SYMPTOMS CAUSED BY LUMBAR DISC HERNIATION

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ABSTRACT

The lumbar disc herniation (LDH) is a dysfunction that causes physical and functional limitations to patients, and may even be incapacitating. The Pilates method is a modality of physical exercise that, through stabilization of the spine, reduces pain and improves the quality of life of its practitioners. The objective was to identify the repercussion of the benefits of the Pilates method on the symptoms caused by LDH. Study of the qualitative type; with a semi-structured interview was used, and the data were analyzed by the content analysis technique. Consisting of four patients, of both genders, diagnosed with lumbar disc hernia, who were performing treatment based on the Pilates method on a regular basis and over 18 years old. The following categories of analyses emerged: Pain and clinical diagnosis of LDH, the relation of lumbar pain with functional capacity, personal relationships and quality of life and repercussion of the Pilates method in health, daily life activities and quality of life of patients with LDH. Patients found that they had a lumbar disc herniation, pain episodes that led to limitations in activities of daily living, such as at work and home. Patients reported a significant improvement after treatment with the Pilates method, even failing to use analgesic drugs, reporting no pain. Patients with LDH presented severe pain, which in most cases led to a limitation in the execution of daily activities. However, after practicing the Pilates method, they had a significant reduction in the painful picture and improvements in functionality.

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INTRODUCTION

Each day is passing, the problems related to the spine increase and the herniated disc is highlighted among the dysfunctions of the spine. Due to its repercussion on the health of the patient, it appears as a public health problem because the symptoms cause limitations of the movements, reduction of the functional capacity and negative alteration in the quality of life (Rezende *et al.*, 2015; Sean *et al.*, 2005). The disc hernia is characterized by the rupture of the fibrous ring, and it causes a displacement of the nucleus pulposus, compressing nerve structures. Lumbar disc herniation (LDH) is the most frequent, and due to the compression of the sciatic nerve, it causes pain in the lower back, radiating to the lower limb, a symptom

defined as lumbosciatalgia (Vialle *et al.*, 2015; Omidi-Kashani *et al.*, 2016). Lumbar pain caused by LDH often leads patients to a degree of functional disability, which brings major limitations in the activities of daily living. Currently, the literature indicates two types of treatments, the surgical and the conventional treatment, based on medication and physiotherapy (Balagué *et al.*, 2012). Through the physiotherapeutic intervention, the individual's pain with LDH can be reduced and even eliminated, allowing the patient greater functionality and reintegrating his functional activities (Nolet *et al.*, 2015). There are several physiotherapeutic treatments aimed at reducing the symptoms caused by LDH, including kinesiotherapy, acupuncture, electrothermal therapy, joint manipulation techniques and Pilates (Anema *et al.*, 2007; Menezes *et al.*, 2010).

The Pilates method was created by Joseph Pilates in 1918, dealing with concepts such as gymnastics, yoga, martial arts and dance, as well as having a variety of exercises performed on solo or instruments (Conceição and Merganer, 2012). Pilates is a method based on physical exercises that work the body and the mind. There are six principles governing the method: concentration, control, precision, the fluidity of movement, breathing, and contraction of the center of force. Associated with these principles, the method is based on the conscious activation of the musculature responsible for the static and dynamic stabilization of the spine, defined as Power House (Dorado *et al.*, 2012). The Power House is the set of abdominal muscles (rectus abdominals, internal and external oblique, transverse abdomen), buttocks, perineum muscles and lumbar paravertebral (Pinheiro *et al.*, 2014). According to the method, these muscles must be contracted during inspiration and expiration, maintenance of correct posture, with lower energy expenditure to the movements, providing stabilization of the lumbar spine (Sinzato *et al.*, 2013). For patients with LDH, the literature indicates that the Pilates method can increase muscular strength and flexibility, generating a postural alignment, motor control, improved consciousness and body perception (Miranda and Morais, 2009; Santos *et al.*, 2015). The objective of this study was to identify the repercussion of the benefits of the Pilates method on symptoms caused by lumbar disc herniation.

MATERIALS AND METHODS

Type of study

This is a pilot study. The fundamental part of research is the choice of which methodology will guide the study because, through it, the research reaches the proposed objective. In the analysis of the repercussion of the Pilates method on the symptoms experienced by patients living with LDH, a qualitative research was carried out. In Minayo (2012) perspective, it is structured by the understanding of the individual's reality and by the interpretation, experiences, living, common sense and social participation in the subject's individual scope. The thematic life history technique was used, which is defined by Ferrarotti (2014) as the oral report of only one part of the interviewee's life story, in which the interview is centered on the subject studied, enabling a detailed analysis of the information.

Participants

The research was conducted in a private clinic, located in the city of Imperatriz-Maranhão, Brazil, during October 2016. As already mentioned, the qualitative research aims at understanding the reality of the individual. Thus, the sample consisted of four patients of both genders, diagnosed with lumbar disc hernia, who had performed at least 10 sessions of the Pilates method regularly and over 18 years old. Only pregnant women were excluded from the study. Initially, a verbal invitation was made to patients enrolled in the clinic. At the moment, all the procedures and purpose of the research were described. After the acceptance, the patients were instructed to sign the Informed Consent Form-TCLE; Only after this act, the interview was started. The research faithfully respected Resolution 466/2012 of the National Health Council, and it was approved by the Ethics in Research Committee of the União de Goyazes-CEP-FUG, with the opinion number 66/2014-2.

Data collection

For the data collection, a semi-structured interview was used, containing questions that triggered and contemplated the proposed objective, as proposed by Szymanski (2004). The interview was conducted initially by the warming, which was an informal moment for the researcher to approach the interviewee. The researcher established a dialog collecting data as a fictitious name to be replaced with the actual name. Subsequently, the interview was conducted with the triggering questions. The interviews that were recorded in audio, when finished, were heard several times to know the material and soon after they were transcribed in full; the names of patients were replaced by, PT1, PT2, PT3 e PT4 (Szymanski, 2004).

Data analysis

The data were analyzed by the technique of content analysis, which Bardin (2011) defines as “to analyze the contents of the messages to obtain systematic and indicative information, in a way that allows knowing the content of the communication.” The first step in the content analysis process was to perform the pre-analysis of the data that was the floating readings of the interviews. After this step, interview data were organized into record units that, in general, is a broader unit of research, the purpose of this step is to set contextual limits to interpreting it. From the unit described above, the units of context that are identified by the homogeneous words in the text emerged. For this reason, it appears in the categories of analysis (Figure 1) (Bardin, 2011). As pointed out by Bardin (2011) and Franco (2008), the technique of content analysis is fragmented chronologically and systematized:

- Pre-analysis: it is considered as the data organization phase to create the corpus of the research. According to Bardin (2011), “The corpus is the set of documents considering to be submitted to the analytical procedures.” In this phase, the floating reading of the interviews already transcribed are carried out looking at the first perception of the messages contained in the text, leaving us “being invaded by impressions, representations, emotions, knowledge and expectations” (Franco, 2008).
- Exploration of the material: units and context units were defined in this the registration. According to Bardin (2011), “Gross results are treated in a way that is meaningful (speaking) and valid. At this stage, it is nothing more than the systematic organization of the decisions taken” starting for the creation of the registration unit. “The recording unit is the smallest part of the content whose occurrence is recorded according to the categories raised.” Records can be of different types: word, theme, character or item (Franco, 2008). In this research, the theme was chosen. Eleven recording units were found in this step (Table 1).

Table 1. Registration Units

Search for exam
Pain description
Intensity of pain
Interference in sleep due to LDH
Insomnia
Stress
Emotional changes
Use of medication
How did the knowledge of the Pilates method
Health benefits of starting treatment with the Pilates method
Satisfaction with the Pilates Method

- After this stage is finished, the units of context appeared. Franco (2008) points out as the background that generates meaning to the categories. According to Bardin, (2011) context units can be created from two criteria: cost or relevance. Here, the pertinence of the themes was used, of which they were stratified according to the recurrence in the interviews. With the help of the registration units, we returned to the data to search for the recurrences and singularities of the themes, looking for what each interviewee had said to quantify the pertinence of the themes that gave rise to six contextual units (Table 2).
- Treatment of results: in this stage, the data were organized from the context units. The categories of analysis, according to Bardin (2011) is an “operation of classifying constitutive elements of a set by differentiation and, then, by regrouping according to the genus (analogy), with the criteria previously defined.” The categories of analysis are described in the table below; these were originated from the context units (Table 3).

RESULTS

Two of the four patients were male, and two were female, with variation between 23 to 64 years old. All four patients had already performed more than 25 Pilates sessions. The number of sessions varied from 24 to 96, patients with more than three months of treatment (24 sessions) had already been discharged, but they chose to continue practicing the Pilates method since they felt an improvement in their general health and physical and mental well-being.

Pain and clinical diagnosis of LDH

The pain was the main symptom reported by patients. The radiating pain began in the lumbar region and traversed the posterior region of the lower limb. The pain felt was qualified as a nuisance that caused numbness.

It is a pain, very strong in the lower back, a pain that upsets me [...] I felt a numbness in that leg (left) that was a pain that I thought was in the bone (PT4).

I felt pain ... it hurt, it fell asleep, and it went down to the leg (PT2).

When I was in crisis, my leg ached and became numb (PT1).

[...] I felt pain in the knee joint, behind [...] (PT3).

The pain reported by the patients occurred due to the nerve compression that the displacement of the intervertebral disc causes, the posterolateral disc herniation in the lumbar region presses the lumbar nerves that innervate the lower limbs. With this, the patients feel numbness, and most of the times there was a reduction of the muscular strength, directly affecting its functional capacity. Painful pain is the first symptom felt by patients with DH, and the aggravation of pain led the patients in this study to seek out and discover their diagnosis. According to the response, the patients said they had an unexpected discovery. They encountered limitations caused by pain and went in search of a doctor and only then could they have the understanding of the real cause of the painful discomforts, as can be seen in the lines below.

Table 2. Registration units and contexts

Registration Units	Context units	Patients
Search for exam Pain description Intensity of pain	Discovery of LDH due to the presence of pain	
Interference in sleep due to HDL Insomnia Stress	Social and personal changes due to HDL	
Emotional changes	Emotional changes due to pain	
Use of medication How did the knowledge of the Pilates method Health Benefits After You Have Been Practiced The Pilates Method	Stopped taking pain medicine after practicing the Pilates method Pain relief through the Pilates method	
Satisfaction with the Pilates Method	Very satisfied with treatment results	

Table 3. Categories of analysis

Context units	Categories of analysis
Discovery of LDH due to the presence of pain	Pain and clinical diagnosis of LDH.
Social changes and people due to LDH Emotional changes due to pain	Relationship of low back pain with functional capacity, personal relationships, and quality of life
Pain relief through the Pilates method Stopped taking pain medicine after practicing the Pilates method Very satisfied with treatment results	Repercussion of the Pilates method on health, daily life activities and quality of life of patients with LDH

[...] Only in some movements of some activity that I felt pain, [...] I discovered it by chance (PT3).

[...] I went to my gynecologist, and she told me to look for an orthopedist because of the very high osteoporosis. I consulted the doctor, and he asked for resonance, I did not even know I had a herniated disc (PT4). The physical limitations caused by LDH caused PT1 to experience undesirable situations. Through the patient's speech, it is possible to verify great limitations in his social context, but that eventually led him to seek a diagnosis.

[...] On December 20th, in a store at the mall [...] then I sat in the middle of the corridor, it hurt so much I sat in the middle of the hall, it was much pain! [...] I remember, on December 23, I stuck in the middle of the street that I sat on the curb, I could not stand walking, I went to the doctor, he "unlocked" me, [...] then I came back there and I discovered that I had herniated disc (PT1).

Relationship of low back pain with functional capacity, personal relationships, and quality of life

Due to the pains that LDH causes, patients, living with LDH undergo changes in their functional activities. When the patient becomes incapable of performing their daily life activities, the quality of life of the patient is directly impaired, when the individual stops performing activities that were once simple, he or she feels unmotivated and still presents stress pictures. In the speeches below, the changes regarding the pain interference in the performance of the patients' ADLs are described.

It is very complicated; it gives a damn mess in our lives because you are sitting and twisting, dying of pain if you are lying in bed and turning around a little bit, it is going to bust you up... I tell you, it is stressful, very bad, very bad indeed (PT4).

When I move and when I sit in a position for too long and in an inappropriate way, it hurts. [...] I was a little stressed because of the pain [...] I was very uncomfortable, I lost many nights of sleep (PT2).

I could not stand, just sitting, if I walked about 100 meters I had to sit, I could not stand [...] (PT1).

Before to ADL changes, patients reported social changes due to pain, where the most evident were the limitation in work activities due to pain.

The pain hinders for me to do some things in my work [...] (PT2).

In my work, it interfered a lot (PT1).

PT1 and PT2 complained a lot about the difficulties encountered in carrying out the activities at work. Such difficulties even hinder job performance. "In the activity that I moved I demanded a lot, because of the pain that I judged enough, I could not take it," PT1 said. PT2 also stated that he was suffering from pain because it hinders for him to perform some activities at work. The pain caused by LDH was the symptom that caused the discomfort. The patients affirmed to go through situations of stress through the limitations, brought about by the constancy of the pain. Therefore, it is possible to

perceive that the pain felt reflected in all the scopes of the life of the patients with LDH, interfering from their ADLs as in their social activities, becoming evident that the consequences of the pain pictures interfere in a negative way in the quality of life of the patients interviewed.

Repercussion of the Pilates method on health, daily life activities and quality of life of patients with LDH

From this category, it is possible to identify the benefits that the Pilates method provided to patients with LDH. It was observed that pain relief was unanimous among patients, as can be seen in the following speeches.

The first week, it was giving a relief and improving that today I do not feel anything else (PT4).

It improved very, very good. The pain does not hurt more the way it hurts, now I feel uncomfortable, but it is a little something (PT1).

I improved with Pilates [...] I improved almost 100% [...] Ah, today I feel painless and calmer (PT2).

The satisfaction of no longer needing to use medication for pain relief was notable in two of the Pilates practitioners. PT4 reported having to take 10 to 12 tablets every day and today does not need anymore, merit she dedicated to the Pilates method; The same thing happened to PT1, who said he did not need medicine anymore.

I do not take any more medicine [...] Now I am good! (PT1).

Through the Pilates method, the patients achieved a significant improvement in pain reduction, reflecting the improvement in ADLs and a marked improvement in the quality of life. After practicing the Pilates method, the patients stated that they normally return to their daily activities without interrupting them.

These days, I washed the floor of the bathroom all without feeling any pain (PT4).

Before to PT1 treatment reported taking time off work because the pain chart today states, "I am working hard that this is lacking is service." A little girl who complained about the limitation of movements shows the gain of flexibility as another benefit acquired with the method.

I like Pilates, mainly because I got stretching (PT3).

Pilates exercises are based on the conscious activation of the Power House specifically of the transverse abdomen, which when properly tensioned, it stabilizes the lumbar spine, a factor that can be attributed to the reduction of the pain of patients with LDH. Through the exercises, they had a positive impact on the patients' lives, which had a marked reduction of pain, increased flexibility and return to ADLs.

Pilates was a lifesaver in my life (PT4).

DISCUSSION

Due to the pain caused by lumbar disc hernia, the patients have a restriction of the physiological and functional movements, also presenting a limitation of the muscular flexibility that

triggers postural problems. However, the stretching and muscle strengthening of the Pilates exercises leads to an improvement in the longitudinal stretching of muscle fibers and reduction of pain levels (Lopes *et al.*, 2012). These findings are consistent with those found in this study. The first symptom experienced by patients with LDH was a pain, which was often incapacitating, leading to a functional limitation interfering with the ADL of the patients studied. However, after the practice of the Pilates method, this picture was reversed, as found by Lopes *et al.* (2012). Thus, with the results presented previously and with the results of this study, Patti *et al.* (2016) identified that the Pilates method promoted a significant reduction of the low back pain of the patients studied by them. Well *et al.* (2014) brings Pilates exercises as a technique that promotes relevant improvements in the pain and functional capacity of patients with low back pain when compared to other therapies such as kinesiotherapy and therapeutic massages. Before looking for the Pilates method as an alternative to reduce pain, the patients studied sought other ways to treat pain, such as drug therapy and conventional physiotherapy, based on electrothermic-therapy and kinesiotherapy. However, they did not get better, opting for Pilates. Only one of the four patients studied sought the manual therapy technique as the first option, from where he was referred to practice the Pilates method. The practice of the Pilates method promotes a satisfactory re-education in the flexibility, posture, muscular strength, sensation of well-being translated in the significant improvement of its quality of life. As pointed out by Lins *et al.* (2013) and by Lima *et al.* (2009) who identified an increase in the flexibility of the ischio-tibial in Pilates practitioners. These results corroborate with the ones entered in the present research; PT3 claims to have improved her flexibility and PT4 who points out that after practicing the Pilates method her life has improved.

Conclusion

It was concluded that patients with LDH presented pain, which in most cases led to a limitation in the execution of daily activities. However, after the practice of the Pilates method, they had a significant reduction in the painful picture, and consequently an improvement in the performance of the ADLs, as well as improvements in the psychosocial and physical aspects. The Pilates method provided patients with movements that were difficult to perform in their daily lives, such as sitting, walking and squatting due to sciatic pain. However, even with the positive results of the Pilates method in reducing LDH pain, few studies addressing the subject are available.

Conflict of interests: The authors certify that there is no conflict of interest.

REFERENCES

- Rezende, R., Júnior, C.J., Silva, C.K., Zanon, I.B., Cardoso, I.M., Júnior, J.L.B. 2015. Comparação da eficácia das técnicas transforaminal e interlaminar de bloqueio radicular feito no tratamento da hérnia de disco lombar. *Rev Bras Ortop.*, 50:220-225.
- Sean, P.G., Romana, K., Joseph, H.P., William, J.M. 2015. *The complete writings of Joseph H. Pilates: return to life through contrology and your health.* Bain Bridge Books. Philadelphia.
- Vialle, E., Vialle, L.R., Contreras, W., Jacob, C.J. 2015. Anatomical study on the relationship between the dorsal root ganglion and the intervertebral disc in the lumbar spine. *Rev Bras Ortop.*, 50:450-454.
- Omid-Kashani, F., Hejrati, H., Ariamaneh, S. 2016. Ten important tips in treating a patient with lumbar disc herniation. *Asian Spine J.*, 10:955-63.
- Balagué, F., Mannion, A.F., Pellisé, F., Cedraschi, C. 2012. Non-specific low back pain. *Lancet*, 379:482-491.
- Nolet, P.S., Kristman V.L., Côté, P., Carroll, L.J., Cassidy, J.D. 2015. Is low back pain associated with worse health-related quality of life 6 months later? *Eur Spine J.*, 24:458-466.
- Anema, J.R., Steenstra, I.A., Bongers, P.M., Vet, H.C., Knol, D.L., Loisel, P., Van, M.W. 2007. Multidisciplinary rehabilitation for subacute low back pain: graded activity or workplace intervention or both? A randomized controlled trial. *Spine*. 32:291-298.
- Menezes, C.R.O., Moreira, A.C.P., Brandão, W.B. 2010. Base neurofisiológica para compreensão da dor crônica através da acupuntura. *Rev Dor.*, 11:161-168.
- Conceição, J.S., Mergener, C.R. 2012. Eficácia do método Pilates no solo em pacientes com lombalgia crônica: relato de casos. *Rev Dor.*, 13:385-388.
- Dorado, C., Calbet, J.A., Lopez-Gordillo, A., Alayon, S., Sanchis-Moysi, J. 2012. Marked effects of Pilates on the abdominal muscles: a longitudinal magnetic resonance imaging study. *Med Sci Sports Exerc.*, 44:1589-1594.
- Pinheiro, K.R.G., Rocha, T.C.C., Brito, N.M.S., Silva, M.L.G., Carvalho, M.E.I.M., Mesquita, L.S.A., *et al.* 2014. Influence of pilates exercises on soil stabilization in lumbar muscles in older adults. *Rev Bras Cineantropom Desempenho Hum.*, 16:648-657.
- Sinzato, C.R., Taciro, C., Pio, C.A., Toledo, A.M., Cardoso, J.R., Carregaro, R.L. 2013. Efeitos de 20 sessões do método Pilates no alinhamento postural e flexibilidade de mulheres jovens: estudo piloto. *Fisioter Pesqui.* 20:143-150.
- Miranda, L.B., Morais, P.D.C. 2009. Efeitos do método Pilates sobre a composição corporal e flexibilidade. *Rev Bras Prescr Fisiol Exer.*, 3:16-21.
- Santos, F.D.R.P., Moser, A.D.L., Bernardelli, R.S. 2015. Análise da efetividade do método Pilates na dor lombar: revisão sistemática. *Rev Bras Ciência Mov.*, 23:157-163.
- Minayo, M.C.S. 2012. Análise qualitativa: teoria, passos e fidedignidade. *Ciênc Saúde Coletiva.* 17:621-626.
- Ferrarotti, F. 2014. *História e histórias de vida.* Natal: EDUFRN.
- Szymanski, H. 2004. *A entrevista na pesquisa em educação: a prática reflexiva.* Brasília: Liber Livro.
- Bardin, L. 2011. *Análise de conteúdo.* São Paulo: Edições 70.
- Franco, MLPB. 2008. *Análise do conteúdo.* 3ª Ed. Brasília: Liber Livro.
- Lopes, C.R., Gonnsaga, F., Okamoto, K., Mota, G.R., Viana, H.B., Tessuti, L.S. 2012. O método Pilates no tratamento da hérnia de disco. *Rev Bras Prescr Fisiol Exer.* 6:506-510.
- Patti, A., Bianco, A., Paoli, A., Messina, G., Montalto, M.A., Bellafiore, M., Battaglia, G., Iovane, A., Palma, A. 2016. Pain perception and stabilometric parameters in people with chronic low back pain after a Pilates exercise program: A randomized controlled trial. *Medicine (Baltimore)*, 95:e2414.

Wells, C., Kolt, G.S., Marshall, P., Hill, B., Bialocerkowski, A. 2014. The effectiveness of Pilates exercise in people with chronic low back pain: a systematic review. *PLoS One*. 9:e100402.

Lins VML, Caldas RR, Carvalho AGC, Barros MFA, Guerino MR, Campos SL, Araújo MGR. 2013. Avaliação da qualidade de vida nos portadores de hérnia de disco lombar praticantes do método Pilates. *Ter Man.*, 11:567-572.

Lima, P.S.Q., Mendes, A.C.G., Laurentino, G.E.C., Montenegro, E.J.N., Medeiros, M.S.L. 2009. O método Pilates no ganho de flexibilidade dos músculos isquiotibiais em pacientes portadores de hérnia de disco lombar. *Fisioter Bras.*, 10:314-317.
