Case Study

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Effects of pilates method in low back pain

Efeitos do método pilates na lombalgia

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Abstract

Introduction: Back pain is all pain conditions, located in the lower back, between the last rib and the gluteal fold. The main goal of Pilates is to strengthen the center of the body, improving spinal stabilization. **Objective**: This study aimed to examining the effects of Pilates on low back pain, checking their effect on low back pain, using a visual analog pain scale, assess the quality of life through the Quality of Life Questionnaire - WHOQOL Bref and measure flexibility by Test FINGER-FLOOR. **Method**: This study was submitted to the ethics committee of a private college in Teresina, PI (no. 18441813.0.0000.5211). The sample was not random type, consisting of six participants with low back pain. They were assessed before and after treatment by means of an evaluation form (age, weight, height, BMI, visual analog pain scale - EVA Test and finger-floor) and the Quality of Life Questionnaire - WHOQOL Bref. 10 individual sessions were conducted with the Pilates method, often two weekly visits lasting one hour each. Data were analyzed using parametric test "t" test, with significance level of $p \leq 0.05$. **Results**: The results showed that treatment significantly reduced pain, with $p = 0.0048$. Regarding quality of life, we can observe significant improvements in the Physical Domain with $p = 0.0288$, and p = Psychological Domain. 0.0477. Already in Social Domains, Domain Environment and overall quality of life, the results were not significant with $p = 0.2894$, $p = 0.6357$ and $p = 0.0830$, respectively. Flexibility in the analysis of observed significant improvement, with $p = 0.0039$. **Conclusion**: Therefore, the Pilates Method can be an effective treatment option in the treatment of lumbago, acting globally.

Keywords: Low back pain; Physical therapy modalities; Flexibility, Quality of life.

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Resumo

Introdução: Lombalgia são todas as condições de dor, localizadas na região inferior do dorso, entre o último arco costal e a prega glútea. O principal objetivo do pilates é fortalecer o centro do corpo, melhorando a estabilização da coluna vertebral. **Objetivo**: O presente estudo teve como objetivo analisar quais os efeitos do Método Pilates na lombalgia, verificando seus efeitos sobre a dor lombar, através da escala visual analógica da dor, avaliar a qualidade de vida através do Questionário de Qualidade de Vida – WHOQOL Bref e mensurar a flexibilidade através do Teste FINGER-FLOOR. **Método**: Esta pesquisa foi submetida ao CEP de uma faculdade particular em Teresina-PI (nº 18441813.0.0000.5211). A amostra foi do tipo não aleatória, constituída de seis participantes com quadro de lombalgia. Os mesmos foram avaliados, antes e após o tratamento, por meio de uma ficha de avaliação (idade, peso, altura, IMC, escala visual analógica da dor – EVA e Teste finger-floor) e do Questionário de Qualidade de Vida – WHOQOL Bref. Foram realizados 10 atendimentos individuais com o método Pilates, com freqüência de dois atendimentos semanais com duração de uma hora cada. Os dados foram analisados através do teste paramétrico "t" de Student, com nível de significância de p≤0,05. **Resultados**: Os resultados mostraram que o tratamento reduziu significativamente a dor, com p= 0, 0048. Em relação à qualidade de vida, pode-se observar melhoras significativas no Domínio Físico com p=0,0288;e no Domínio Psicológico com p=0,0477. Já nos Domínios Social, Meio Ambiente e Domínio qualidade de vida geral, os resultados não foram significativos com p=0,2894, p=0,6357 e p=0,0830, respectivamente.Na analise da flexibilidade observou-se melhora significativa, com p= 0,0039. **Conclusão**: Portanto, o Método Pilates pode ser uma opção de tratamento eficiente, no tratamento da lombalgia, atuando de maneira global.

Palavras-chave: Lombalgia; Modalidades de fisioterapia; Flexibilidade; Qualidade de vida.

INTRODUCTION

The dysfunctions of the lumbar spine, causing functional disabilities, are of high prevalence worldwide. Among these disorders, low back pain is a major health problem. It is one of the most common diseases in the Western world, affecting approximately 70-80% of the population at some time in their life.[1] In functional terms, is responsible for a significant financial cost, since the large number of absences from work in private companies and public institutions, and an inability to daily life caused by it, reaches high percentage of the population.[2]

Low back pain are all conditions of pain, located in the lower region of the back, between the last costal arch and the gluteal fold. Low back pain has many causes, among which we highlight: degenerative, congenital, infectious, inflammatory, stress, poor posture, anxiety and emotional tension.[3]

In low back pain, one can observe a direct relationship with pain symptoms, reduced range of motion and change the standard of flexibility or a synergistic interaction of these factors, therefore, increase the severity of the symptom picture and can lead to early fatigue of the muscles paraspinal with change in functional performance.[4]

Among the various treatment options for low back pain to search for complementary therapies are high, being one of the Pilates wanted features.[5] The exercise program of Pilates focuses on postural muscles which help keep the body balance that is essential to support the spine. Particularly, respiration exercises improve the postural alignment and stretching of the deep muscles of the trunk, which are important for relieving and preventing pain in column.[6]

The Pilates method enabling acts performing exercises that are not possible to achieve because of the limitation of pathology through its holistic approach and training that combines body and mind, he considers all segments of the body in harmony, rather than focus solely on problem areas.[7]

The proposal of Joseph Pilates, creator of the method, has a wider benefit to the human body, as stimulate circulation, improve flexibility, range of motion, muscle strength, improve posture, finally, physical and mental conditioning.[8,9]

The Pilates method is grounded in the applicability of six principles: centering, pictured at center of power of the human body (located on the circumference corresponding muscles of the abdomen to the knee and forearm hands), known as "Powerhouse"; Control, characterized in control muscle movements executed during movements; Concentration, which is described by developing exercises with correct mental intent and focus on the process of deepening consciousness in motion; Fluidity, which is demonstrated by the efficiency of movement with rhythm; Breathing is understanding the importance of exhaling to stimulate breathing and intensify the movement; Accuracy is the perfect coordination of movements.[10]

The finding that the number of practicing Pilates has increased greatly in recent decades comes only encourage and support the need for scientific support to professionals working in this area.[11]

Thus the present study is justified by the high prevalence of low back pain, which generates large impact on the lives of people affected by this symptom, which generates high levels of absenteeism from work

and retirement in the period of greatest productivity. And the need for scientific research on the Pilates method, since its purpose is to strengthen and be responsible for stabilizing the spine and contribute to the reduction of back pain and consequently, decrease the use of drugs and absences from work.

This study aimed to analyze the effects of the Pilates Method in low back pain and checking their effect on this disease using the visual analogue pain scale, assess the quality of life through the Quality of Life Questionnaire - WHOQOL Bref and measure flexibility through floor-Finger Test.

METHODS

The survey was prepared pursuant to Resolution No. 466/2012, the National Board of Health/Ministry of Health regarding research involving human subjects. The study was initiated after approval by the Research Ethics Committee of the Faculdade Integral Diferencial (FACID) under protocol number 18441813.0.0000.5211. Survey participants signed an informed consent, with which they were informed and educated about the study, guaranteeing confidentiality, anonymity and non-use of the information to the detriment of others.

This is a study of the experimental, longitudinal with a quantitative approach, aiming to verify the effects of the Pilates method in the treatment of low back pain. The survey was conducted in a school clinic of a private institution of a college in the city of Teresina-PI, in the period February to April 2014. Inclusion criteria were: participants between 20 and 50 years with a clinical diagnosis of low back pain. Exclusion criteria were: subjects who were conducting some other treatment for low back pain and those with contraindications to Pilates.

The sample was not random type, consisting of six participants, chosen intentionally. The study participants underwent a physiotherapy evaluation form containing the following information: name; age; weight; height; BMI; the Visual Analog Scale pain to low back pain presented numerical graduation; Finger-floor test for evaluation of flexibility, which the spinal flexion was observed, noting the distance in centimeters from the tip of the third finger to the ground in flexion of the spine, and still Questionnaire Quality of life-WHOQOL Bref at the beginning and end of treatment.

Ten individual sessions of Pilates solo, lasting one hour, twice a week were performed.

Treatment were divided in three phases:

First phase:

1. Awareness of the powerhouse and breathing
2. Stretching hamstrings, gluteus, psoas / quadriceps (each for 30 seconds)
3. Abdominal and hip with knees bent and feet flat on the floor, trunk flexion associated with hands under the neck (12 repetitions).
4. Abdominalandhipwithknees bentandfeet flaton the floor withthe ballbetween the legs, trunk flexionassociatedwithhandsunder the neck (12 repetitions).
5. Abdominal with one leg with hip and knee flexed and foot flat on the floor, and the other with 90-degree flexion of the knee and hip, and working with dumbbells chest (12 repetitions).
6. Elongation manual abductor (therapist in front of the patient abducting the patient's leg up to a physiological limit the patient for 30 seconds with a bent legs and the other with stretched knee).
7. Abdominal with one leg, hip and knee flexed and foot flat on the floor and the other leg with knee extension and hip flexion to 45 degrees, with ball between the legs, causing adduction (12 repetitions).
8. Abdominal with trunk flexion, hip and knees bent and feet flat on the floor, the patient bends the trunk laterally playing a hand in ipsilateral ankle (10 repetitions each side).
9. Hamstring stretching
10. Strech piriformis (patient in dorsal decubitus hip and knee extended and the other leg flexion and adduction of hip and knee flexion with foot flat on the floor next to the patient therapist, supports the proximal hand on the contralateral ASIS, and causes the distal hand coordinated adduction movement in order to lengthen the piriform for one minute).
11. Strech the scalene/sternocleidomastoid (patient in supine, with hip flexed and feet flat on the floor, knees therapist behind the patient recumbent, turning the neck of this, puts a hand on the insertion of the sternocleidomastoid/scalene and the other on the sternum, Ask of the patient to inhale and exhalation (oral), keeps a steady hand and proximal to distal hand directs the force in flow direction, 4 times each side for one minute).

Second Phase:

1. Stretching hamstrings, gluteus, psoas quadriceps, adductors (each for 30 seconds).
2. Abdominal with trunk flexion, hip and knee flexed to 90 degrees, with ball between his legs, coordinates patient breathing, squeezing the ball (2 X10 repetitions).
3. Abdominal coordination with patient in supine, hips and knees flexed to 90 degrees position, extended and flexed elbows and shoulders. While that is an elbow

extension of the upper limbs, it is knee extension of the contralateral side, using dumbbells (10 reps each leg).

4. Abdominal with patient supine with hips and knees flexed to 90 degrees, performing abduction of legs, coordinating with triceps exercises, shoulder flexion and elbow at 90 degrees, followed by elbow extension (2x10 repetitions).
5. Stretching hamstring.
6. Strech piriformis (patient in dorsal decubitus hip and knee extended and the other leg flexion and adduction of hip and knee flexion with foot flat on the floor next to the patient therapist, supports the proximal hand on the contralateral ASIS, and causes the distal hand coordinated adduct in order to lengthen the piriform for one minute) movement.
7. Strech of scalene / sternocleidomastoid (patient in supine, with hip flexed and feet flat on the floor, knees therapist behind the patient position, rotating the neck of this, puts a hand on the insertion of the sternocleidomastoid / scalene and the other on the sternum, asked the patient to inhale and exhalation (oral), keeps steady hand and the proximal to distal hand directs the force in flow direction, 4 times each side for one minute).

Third phase:

1. Stretching hamstrings, gluteus, psoas / quadriceps, adductors (each for 30 seconds).
2. Abdominal on the ball, with sacrum resting on the ball, bending the hips and knees and feet flat on the floor. Hands resting on his chest is small trunk flexion (L1-L3), stressing close the ribs and retroversion of the pelvis in order to protect the lower back (3 X 10 reps).
3. Abdominal triceps associated with adduction of legs (beans between legs), coordinating with triceps exercises, shoulder flexion and elbow at 90 degrees, followed by elbow extension (2x 10 repetitions).
4. Previous chain elongation using beans in the legs, which will initially be flexed and dumbbells in hands starting from a shoulder flexion of 90 degrees, the knee extension expires there spreading the legs of the trunk, and hands away from the trunk, up to 180 degrees of flexion (2x 10 reps).
5. Abdominal with flexion of the trunk, hip and knees bent and feet flat on the floor, the patient leans the trunk laterally playing hand on the ipsilateral ankle (10 reps each side).
6. Abdominal with patient supine with hips and knees flexed to 90 degrees, performing abduction of legs, coordinating with triceps exercises, shoulder flexion and elbow at 90 degrees, followed by elbow extension (2x 10 reps).
7. Stretching hamstring.
8. Strechpiriformis (patient in dorsal decubitus hip and knee extended and the other leg flexion and adduction of hip and knee flexion with foot flat on the floor next to the patient therapist, supports the proximal hand on the contralateral ASIS, and causes the distal hand coordinated adduction movement in order to lengthen the piriform for one minute).
9. Strech of scalene/sternocleidomastoid (patient in supine, with hip flexed and feet flat on the floor, knees therapist behind the patient position, rotating the neck of this, puts a hand on the insertion of the sternocleidomastoid/scalene and the other on the sternum, asked the patient to inhale and exhalation (oral), keeps steady hand and the proximal to distal hand directs the force in flow direction, 4 times each side for one minute).

Data were organized into spreadsheets Microsoft Office Excel 2010 program for creating result tables. Subsequently, the data were transferred to the statistical program Graph Pad 5.0 Prim with which graphs were created and these were submitted to the test of comparison of means t student with confidence interval of 95% and significance at p <0, 05 for the start and end of sets of paired parameters Pilates sessions. Subsequently the results were presented in form of graphs and table.

RESULTS

The sample consisted of six participants with signs of back pain with a clinical diagnosis of low back pain. The sample was homogeneous, related to anthropometric parameters of the subjects of the research.

For the analysis of the flexibility of Finger-Floor (Figure 1) test was used. Were evaluated at the beginning and end of treatment with the Pilates Method. In the

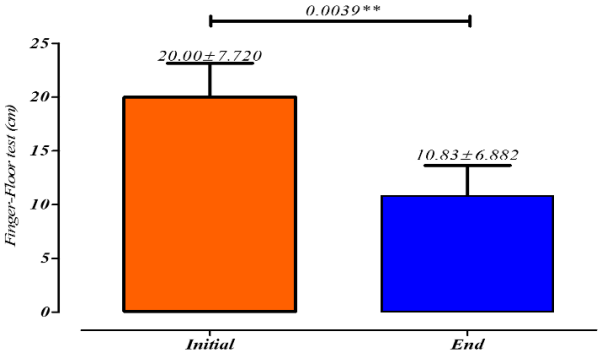

Figure 1. Finger-Floor test (mean ± standard deviation). **Significant (p<0,05).

initial evaluation can be seen that the average distance from the toe to the ground was 20cm ± 7.72 and after 10 sessions yielded an average of 10.83cm ± 6.882, to gain flexibility 9.17cm, with p = 0.0039.

In this study significant results were found in increased flexibility which corroborates with the study of Bertolla et al.,[12] who despite having different study sample also reported satisfactory results in his research on increasing the flexibility of youth soccer athletes, with the Pilates method. The program presented acute effects, represented by the statistically significant increase in flexibility in the post-immediate (p <0.05 in the bank of Wells and p <0.01 in fleximeter) and chronic, the observed slight decrease (not statistically significant, p> 0 05) later in the post-period for both methods.

Reis et al.[13] evaluated in their study, the flexibility of 10 seamstresses in the textile industry before and six months after the start of a specific program of gymnastics. The results showed significant improvement in hip flexibility and significant decrease in complaints of back pain. These authors concluded that there is strong relationship between the shortening of the posterior thigh muscles and the presence of low back pain. The Pilates method also achieved satisfactory results in flexibility gains in the participants of this study, and it is believed, as the authors cited above, this result influenced the decrease in back pain, seen in the chart below.

The study of Lima et al.[14] also sought to evaluate the gains in flexibility, taking as parameter the hamstrings muscles through Pilates in participants who had low back pain, but suffering from lumbar disc herniation. Voluntarily participated in the study and thirty two subjects presenting diagnosis of lumbar disc herniation. Patients participated in Pilates sessions lasting 60 minutes twice a week for eight weeks. In the group of patients studied, it was found gains in flexibility of hamstrings statistically significant. improving the composition of flexibility.

Analyzingthe collected data related to pain (Figure 2), the Visual Analogue Scale (VAS), one can observe that at the initial assessment, mean VAS was 7±0.632. In reevaluation can be observed an average of 3.33±1.966, a total reduction of 3.67. on average.

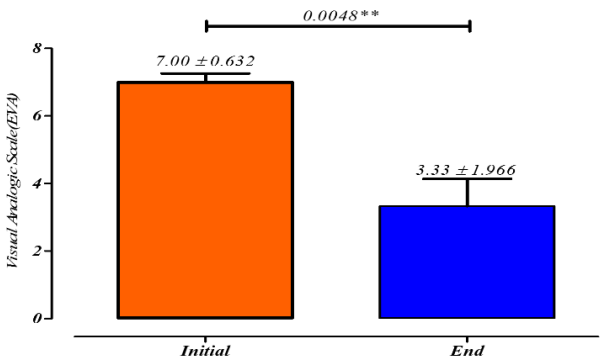

Figure 2. Visual Analogic Scale. **Significant (p<0,05).

Factors that interfere with low back pain are interdependent, probably because of improved functionality is associated with a reduction in pain intensity which in turn is associated with improved flexibility and muscle strength of the trunk.[15]

It can be observed that the results found in this study were similar to studies like the one conducted by Schossler et al.[16] where we obtained a significant decrease in pain or total absence of the lumbar region in all subjects with a significant increase in the flexibility of the hamstrings after the treatment period with the Pilates method,.

The calculation of the Physical Domain of Quality of Life Index WHOQOL-Bref (Figure 3), initially of 55.95 ± 10.99. In revaluation can be observed an average of 70.24±13.68. As we can observe a significant improvement (p=0.0288).

Related to Psychological Domain Quality of Life Index WHOQOL-Bref (Figure 4), we initially observe an average of 65.28 ± 14.59. In reevaluation can be observed an average of 76.39 ± 10.09. There was a significant improvement (p = 0.0477) in the field of Psychological Index of Quality of Life WHOQOL-Bref.

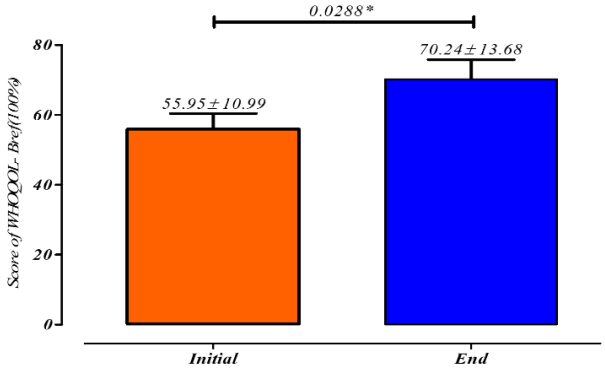

Figure 3. Physical Domain of Quality of Life WHOQOL-Bref. *Significant (p<0,05).

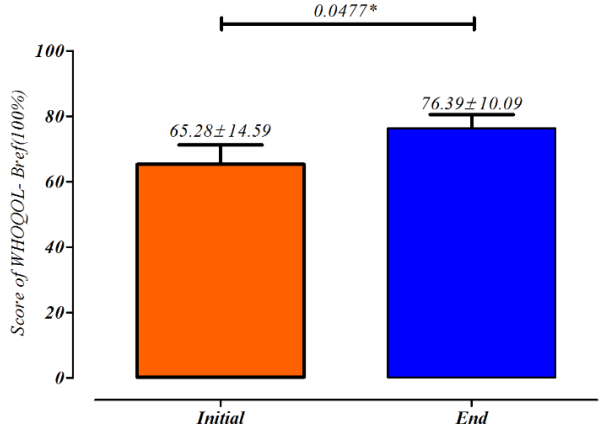

Figure 4. Psychological Domain Index Quality of Life WHOQOL-Bref. *Significant (p<0,05).

Related to Social Domain of Quality of Life IndexWHOQOL-Bref (Figure 5), we can see that the initial assessment an average of 72.22 ± 22.77. At reassessment, there was an average of 79.17 ± 14.67. In this area there was a significant improvement (p = 0.2894).

Related to Environmental Domain of the quality of life index WHOQOL-Bref (Figure 6), we observe that, in the initial assessment, we obtained an average of 66.67 ± 15.14. At reassessment, there was an average of 68.23 ± 18.05. In this area there was a significant improvement (p = 0.6357).

The calculation of the General Quality Domain of Life Quality Index WHOQOL-Bref (Figure 7). At the initial assessment, we obtained an average of 65.03 ± 10.52. In reevaluation can be observed an average of 73.51 ± 11.43. In this area there was no significant improvement (p = 0.0830).

Sacco et al.[17] state that in order to improve the quality of life, each individual has their preferences when looking for activities that work the body a comprehensive and interesting way. This study worked the Pilates method, which performs a global workforce, and the sample was composed of participants who complained of back pain therefore subject to the limitations in functional activities and thus quality of life.

Stefane et al.[18] evaluated the perception of pain, disability and quality of life in individuals with chronic low back pain. The sample consisted of 97 participants, and used a 11-point numerical scale to measure the intensity of pain, the Roland-Morris questionnaire for disability and WHOQOL-Bref to measure quality of life. The result showed that the perceived pain intensity was considered high, the level of disability found were considered serious and the physical domain of quality of life the most prejudiced and strongly associated with the level of disability. From the observation of this study as it is believed to include a questionnaire of quality of life, as WHOQOL-Bref in research evaluating the response of low back pain from treatment methods, is something relevant to analysis of the results.

The quality of life can be assessed by several questionnaires, this research was chosen the WHOQOL-Bref which consists of 26 items and divided into four domains: physical, psychological, social relationships and environment; addition of a domain of overall quality of life quality. Within the present study, we observed that the physical domain is the most relevant, the fact that it is composed of questions relating to pain, discomfort, energy, fatigue, sleep and rest, these factors may adversely affect the subject with low back pain. Analyzing Figure 3, can observe a significant result, leading to believe that Pilates can have an influence on one or more of these factors questioned the physical domain.

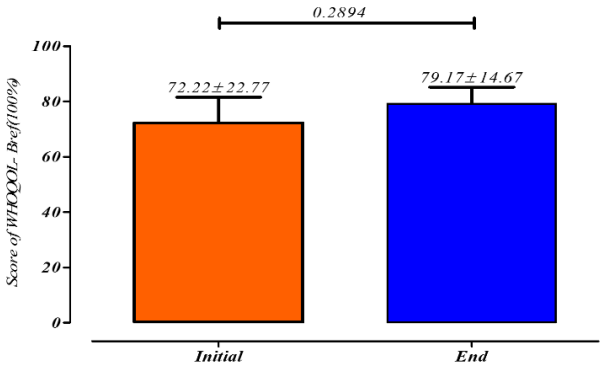

Figure 5. Social Domain of Index Quality of Life WHOQOL-Bref.

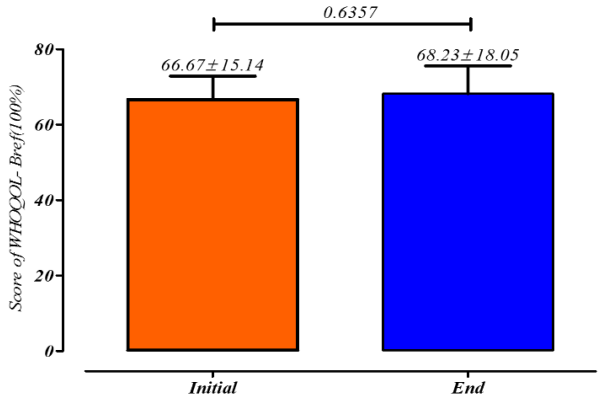

Figure 6. Environmental domain of the Index of Quality of Life WHOQOL-Bref.

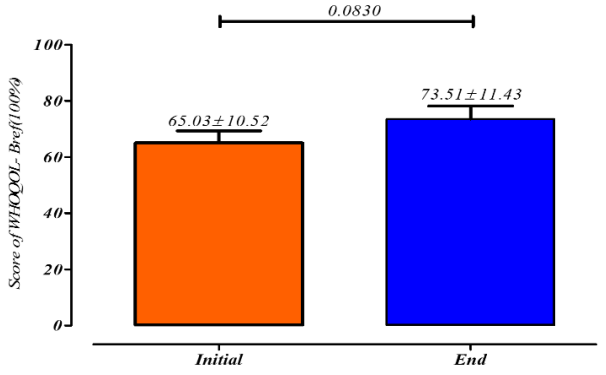

Figure 7. General Quality Domain of Life Quality Index WHOQOL.

In the study by Oliveira et al.[19] 26 seamstresses, who were divided into two groups, one with low back pain nd one without low back pain (control group)were interviewed. With the results, it was observed that 73.07% of the seamstresses had low back pain. In the analysis of SF-36, there was worse score on all parameters of quality of life in the group with low back pain. In the assessment of disability, met average of 4.74 for the group with low back pain and 0.57 for the control group, which in the statistical analysis showed a significant difference (p <0.05). It can be concluded through this study that seamstresses with low back pain have a worse quality of life and functional disability.

Nogueira and Navega[20]analyzed the effects of a "Back School Program" program in relation to quality of life, functional capacity, flexibility and pain intensity of adult workers in administrative activities in the city of Marilia. A total of 33 workers joined in the study. The program was conducted in seven meetings with four groups once a week, lasting an hour each. Before and after the intervention, the volunteers responded to the SF-36 and the functional Roland-Morris disability questionnaire, performed the sit and reach with the bank of Wells test and reported the pain intensity on a visual analogue scale. The results were significant in improving the quality of life, functional capacity, flexibility and intensity of pain.

Although the present study used different treatment method and survey results of the above study were similar regarding the improvement of pain symptoms, flexibility and improved quality of life for participants.

In this study it was observed that the overall quality domain index WHOQL Quality of Life-Bref was close to significant (p = 0.0830). It is believed that two factors could have influenced: the sample size, which was small, and the fact that the domain overall quality is related to all areas including social and environmental; and these were not significant - which may have occurred due to lower relationship between these areas and the variables analyzed in the study.

Through regular practice of Pilates, "the individual rediscovers his own body with more coordination, balance and flexibility." Regardless of age, anyone can be benefited by this method that improves the quality of life and provides quick results.[21]

CONCLUSION

Low back pain results in a series of negative effects on the lives of people affected by these symptoms, often related to decreased flexibility and strength of stabilizing muscles of the spine, which may affect their quality of life, leading in many cases to sick leave and early retirements.

The Pilates method has the intention to physical and mental conditioning, improving strength, balance, flexibility and body awareness, thus improving the quality of sleep and increased sense of well-being, providing better functionality.

In the study we observed a significant improvement in back pain, in addition to increased flexibility and improved quality of life of participants, with respect to the physical and psychological domains. Therefore, the Pilates method can be an effective treatment option, among physiotherapy resources available, and a different procedure for the treatment of patients with low back pain, since it operates globally, improving physical and psychological aspects.

Further studies with larger sample and for a longer period of application of the technique are required in order to obtain more scientific evidences the use of the method Pilates in the treatment of low back pain.

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