Original Article

Effect of dance in aquatic environment in fibromylgia

Efeito da dança em ambiente aquático na fibromialgia

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ABSTRACT | INTRODUCTION: Fibromyalgia is one of the most frequent rheumatological diseases and with a higher incidence in the female population. Physiotherapy in general is one of the treatments used to minimize symptoms and aquatic therapy has been showing better results". **OBJECTIVE:** To evaluate the pain level, life quality, fatigue, diastolic and systolic blood pressure, and total distance covered of women with fibromyalgic, before and after therapy with jazz dance in aquatic environment. **METHOD:** A longitudinal study with semiprobabilistic sample was carried out after approval by the Ethics Committee of Universidade Presbiteriana Mackenzie. There were 10 volunteers, aged between 40 and 70 years. They were submitted to 22 sessions, being it twice per week and contemplating 20 minutes of initial stretching, 30 minutes of dance and 10 minutes of relaxation. Data were collected through the use of scales: Fibromyalgia Impact Questionnaire (QIF), Borg Scale (Fatigue) and 6-Minute Walk Test (6MWT) that were applied at the beginning and end of the collections, and analog pain scale (EVA), which was applied at the beginning and at the end of each intervention. The data were initially submitted to the KS test to verify the normality of the sample, then analyzed by Wilcoxon and Student T tests, with significance level $p \leq 0.05$ (5%). **RESULTS:** There was a significant difference when the initial EVA was related to the final EVA, with $p = 0.000$. Regarding QIF, there was no significant difference when comparing initial and the final EVA, with $p = 0.241$. Even as the TC6 in the variables systolic blood pressure ($P = 0.780$), diastolic blood pressure ($p = 0.257$), Borg scale ($p = 0.435$), and total distance covered ($p = 0.765$). **CONCLUSION:** Dance as an aerobic exercise in aquatic environment provided an improvement in pain.

KEYWORDS: Fibromyalgia. Dance therapy. Hydrotherapy.

RESUMO | INTRODUÇÃO: A fibromialgia é uma das doenças reumatológicas mais frequentes e com incidência maior na população feminina. A fisioterapia é um dos tratamentos mais procurados para minimizar os sintomas, e a terapia aquática tem apresentado melhores resultados". **OBJETIVO:** Avaliar a dor, qualidade de vida, fadiga, pressão arterial (PA) sistólica, diastólica e distância total percorrida de mulheres com fibromialgia (FM), antes e após terapia com dança do tipo *jazz dance* em ambiente aquático. **MÉTODOS:** Foi realizado um estudo longitudinal com amostra semiprobabilística após aprovação da comissão de ética da Universidade Presbiteriana Mackenzie, por meio da plataforma Brasil. Participaram 10 voluntárias, com idade entre 40 e 70 anos, submetidas a 22 sessões, 2 vezes por semana, com 20 minutos inicias de alongamento, 30 minutos de dança e 10 minutos finais de relaxamento. Para a coleta de dados foi utilizado o Questionário de impacto da Fibromialgia (QIF), Escala Borg (Fadiga), Teste de caminhada de 6 minutos (TC6) e escala análoga de dor (EVA). Os dados obtidos foram inicialmente submetidos ao teste de KS para a verificação da normalidade da amostra, em seguida analisados por testes estatísticos *Wilcoxon* e *T-Student*, com nível de significância $p \leq 0.05$. **RESULTADOS:** Houve diferença significativa importante quando comparado o EVA inicial com o EVA final, com $p=0,000$. Em relação ao QIF não houve diferença significativa quando comparado o inicial com o final, sendo $p=0,241$. Assim como no TC6 nas variáveis pressão arterial sistólica ($p=0,780$), pressão arterial diastólica ($p=0,257$), escala Borg ($p=0,435$) e distância total percorrida ($p=0,765$). **CONCLUSÃO:** A dança como exercício aeróbico em ambiente aquático proporcionou melhora na dor, não apresentando alteração significante nas outras variáveis.

PALAVRAS-CHAVE: Fibromialgia. Terapia através da dança. Hidroterapia.

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Introduction

The Fibromyalgia (FM) is one of the most frequent rheumatological diseases and its main characteristics are the diffuse and chronic musculoskeletal pain, fatigue and sleep disorder, hard diagnosis and for the inexistence of an objective clinical or laboratory milestone[1].

The main complaint presented in the fibromyalgia is the pain; which in turn is defined as a sensory and emotional unpleasant experience associated or similar to the actual or potential tissue damage (International Association for the Study of Pain – IASP, 2020)[2].

This syndrome affects between 0.6 and 4.4% of the world population and 2.5% of the Brazilian population, with higher incidence between 20 and 55 years old women and the main theories about its etiology and pathophysiology comprise the central awareness, dysfunction of the neuroendocrine system and generalized fascial inflammation[3,4].

For the treatment is necessary a multidisciplinary approach in association with the pharmacological measures, thus integrating the work of psychologists, nutritionists, physical educators and physiotherapists so that the physical and psychic benefits are achieved accurately[5].

Studies demonstrate the role of the Physiotherapy in the FM embracing various types of treatments; such as strengthening and stretching exercises[6], massage therapy[7], relaxation exercises[8] and aerobic exercises[9]presenting satisfactory results mainly in the reduction of symptomatology.

In addition to the types of treatments mentioned above, the aquatic physiotherapy has been recommended as the main treatment of patients with FM, due to the benefits that the therapeutic effects of the water bring to the individual, such as reduced sensitivity to pain, reduction of tension and muscle spasms by muscle relaxation, decreased impact on joints, lower members overload and improved peripheral circulation[10].

However, the dance therapy has been much researched and currently used, because it can be an important complement to the other forms of therapy and pharmaceutical treatment for the patients with chronic pain. The jazz dance is the dance that performs the combination of the body movements in various rhythms used at the same time, from the slow and winding to the fast and striking[11].

Through the rhythmic activities that are provided by dance, it is possible to modulate contraction and the muscle relaxation in terms of speed, intensity and duration of movements, generating body control in a segmented way, including dimensions that theoretically have a potential to relive the tension conditions, stress and pain in patient with FM, thus improving the life quality as well[12].

That said, the aerobic exercises together with the aquatic physiotherapy program provide a planned activity, structured, repetitive, and purposeful, in which the dance can be considered a type of aerobic exercise[13]. Given the above, the aim of this study was to evaluate the pain, quality of life, fatigue, systolic, diastolic blood pressure and the total distance covered by women with FM, before and after therapy with jazz dance in an aquatic environment.

Methodology

A longitudinal study was carried out with semiprobabilistic sample after approval by the ethics committee of Mackenzie Presbyterian University, via Brazil Platform, CAAE: 44371215.90000.0084.

Data were collected using the scales: Fibromyalgia impact Questionnaire (FIQ), Borg Scale (Fatigue) and 6-minute walk Test (6MWT) that were applied at the beginning and end of the collections and visual analog scale (VAS) that was applied in the beginning and at the end of each intervention.

The intervention lasted 22 days of group care of FM patients that was performed twice a week, totaling 11 weeks. The treatment followed a sequence of 1-hour exercise sequence, composed by initial 20 minutes of active stretching of the posterior and anterior muscular chain, 30 minutes of aquatic dance (aerobic exercise – jazz dance style) and final 10 minutes of relaxation with floats.

The jazz dance style was composed by rhythmic and choreographed movements, from the slow to the fastest one. The songs were chosen by the participants themselves and in the end floats were used in the participants' popliteal region for relaxation, besides the cervical float. A calmer song was played in those 10 minutes, besides light inhibition.

Ten volunteers, from the state of São Paulo were invited to participate in this study; they were submitted to an initial evaluation. Women with fibromyalgia were inclusion criteria and partially or totally adapted to the liquid environment (swimming pool) in which they have participated in previous aquatic Physiotherapy programs and the non-inclusion criteria, fear of the liquid environment and dermatological lesions.

The institution in which the data were collected, Mackenzie Presbyterian University, (Alphaville Campus) was informed through the information and consent letter sent to the institution.

All the volunteers invited to participate were informed about the study proposal, the handling performed, the location of the performance (Physiotherapy Clinic of Mackenzie Presbyterian University Alphaville), the necessary clothing (swimsuit and swimming cap), the inclusion and exclusion criteria and the period of development.

For the participants that filled the inclusion criteria was offered a meeting with explanation and guidelines about the fibromyalgia and the treatment of aquatic physiotherapy associated with dance, in addition to its importance in the quality of life, in order to encourage the participation.

After being informed, the participants confirmed their participation by signing the Free and Informed Consent Form and the Information Letter to the Subject of Research.

The materials used for this research were: Physiotherapy Clinic of Mackenzie Presbyterian University Alphaville; Swimming pool heated to 34°C (1.20m deep) from the Physiotherapy Clinic of Mackenzie Presbyterian University Alphaville; Float (foam pool noodle); FIQ and VAS scales, Borg Scale and 6-minute walk Test.

The values obtained were initially submitted to the KS test to verify the normality of the sample and then analyzed by parametric and non-parametric statistical tests. Student T test for systolic BP analysis and total distance covered and Wilcoxon test respectively for analysis of VAS, FIQ, diastolic BP and fatigue, adopting a significance level of $p \leq 0.05$ (5%), being represented by tables.

Results

The 10 participants had an average age of 53 ± 10.77 years, being female, married, living in the Barueri region (São Paulo) and FM carriers.

In table number 1 the median and the interquartile deviation referring to the visual analog scale (VAS) can be seen, related to quantitative pain that the participants reported in the beginning and in the end of each intervention. The analysis was performed using the Wilcoxon non-parametric test.

Table 1. Comparison of the initial VAS with the final VAS

VAS	Median	Interquartile	P-value
Before	4	0 – 7	
			0,000***
After	3	0 – 6	

Result of the Wilcoxon test. Significance P≤0.05.

When analyzing the value of VAS before and after, a significant improvement in the participants' pain intensity was observed and to understand this improvement just observe that there was a reduction in the median from 4 to 3.

Regarding the FIQ questionnaire, applied before and after the 75-day treatment, related to the quality of life of FM patients, the analysis was performed using the Wilcoxon non-parametric test. We can see that the median score decreases from 73.52 on the first day of the intervention to 70.28 on the last day of the intervention, that is, the lower the score, the better the individual's quality of life, however when the statistical test is performed, there was no significant difference with the p-value of 0.241. (Table 2)

Table 2. Comparison of FIQ before and after intervention

VAS	Median	Interquartile	P-value
Before	73,52	56,70 – 85,70	
			0,241
After	70,28	61,32 – 76,99	

Result of the Wilcoxon test. Significance P≤0.05.

In table number 3, the parametric T-Student test was used to compare data from before and after intervention of the systolic BP variables and total distance covered. For the variables diastolic BP and Borg Scale were used the non-parametric Wilcoxon test.

From the data presented above, there was no statistically significant difference (p≥ 0.05).

Table 3. Comparison of Systolic Blood Pressure, Total Distance Traveled, Diastolic Blood Pressure and Borg Scale before and after intervention

Variables	Mean ± SD Before	Mean ± SD After	P-value
Systolic Blood Pressure	133 ± 11,60	132 ± 13,17	0,780
Total Distance	483,5 ± 106,74	489 ± 88,45	0,765
Variables	Median (Interquartile) Before	Median (Interquartile) After	P-value
Diastolic Blood Pressure	90 (80 – 90)	80 (80 – 90)	0,257
Borg Scale	5 (5 – 7,25)	6,5 (5 – 7,25)	0,435

Results of the T-Student (Systolic blood pressure and total distance) and Wilcoxon (Diastolic BP and Borg Scale) tests. Significance P≤0.05.

Discussion

The association of dance and aquatic environment presents very scarce literature, therefore, as an innovative way and adding to the field of physiotherapy research, we carried out the first study that evaluates jazz dance in aquatic environments as a therapeutic modality, as a practice of physical activity and as an intervention in women with FM, analyzing the following variables: pain, quality of life, fatigue, systolic, diastolic BP and total distance covered before and after the dance therapy.

The time, frequency, number of repetition and loads used are important to have positive results regarding pain improvement, quality of life and functional capacity in patients with FM; it is observed that the ideal time would be between 2 to 32 weeks, with 2 to 3 times a week[14]. However, in this study we had no parameters for the aquatic environment, therefore we believe that as we worked for 11 weeks and saw some positive results, the extension of this protocol for longer could achieve the results in all variables searched.

The control of pain chart is reported as the main objective of FM treatment, aimed at restructuring the functional capacity and improving the patient's quality of life[15]. When we talk about the pain variable, described in the study, it was the one that got the most significant important difference, in which the main complaint of the women during dance movements was that the pain limited the performance of the entire range of movement proposed, but that was not a reason for giving up the intervention and the participants always reported an improvement at the end of the therapy.

Regarding quality of life, in our research we did not observe any statistically significant changes, however clinically, all volunteers reported that dance combined with music made them put aside their limitations and pain and that positively influenced self-esteem, because that was a time for them to vent their concerns, pains and afflictions present in everyday life, improving the interaction between them, bringing pleasure[16].

When we evaluated the before and after of 6MWT it was possible to analyze a worse performance in the functional evaluation of the participants, this fact resembles a study carried out in 2011, which also reports a worsening in the functional capacity by the 6MWT in women with FM when related to a group of healthy women, that according to Homann, et al. is due to the increase in painful intensity and the subjective perception of effort[17].

An important aspect to also analyze in the 6MWT is the Borg Scale that assesses fatigue and in women with FM it is known that exhaustion occurs faster than in healthy individuals due to three possible explanations: the chronic pain leads to activation of the stress system, sleep disturbance and the presence of depression. In the present study there was no significant difference in this aspect, we suggest that the intervention time was not enough to substantiate this hypotheses[18-20].

From that, it is possible to verify that the aerobic exercise seems to positively influence the functional capacity of the Fibromyalgia patients, that is, in just 75 days of intervention it was possible to increase the distance covered in 6.5 meters, however we suggest an increase in the number of sections so we can prove the results in other investigated variables.

The routine of women with FM must contain necessarily the regular practice of physical activity, considering that physical exercise can assist in improving or maintaining the physical fitness of these women, it is known that its regular practice can enable a greater sense of general well-being, improving other FM-related symptoms. Scientific evidence has shown benefits especially from the aerobic exercises on the functional capacity of these women. In summary, dance associated with the aquatic environment seems to be an effective alternative for the improvement of the pain symptom, quality of life, fatigue, systolic, diastolic BP and total distance covered.

Conclusion

The dance as an aerobic exercise in an aquatic environment provided a significant improvement in the pain variable. Regarding the quality of life, fatigue, systolic and diastolic BP and the total distance covered as shown in the results tables and discussed, there was no significant improvement. However, there is a need for more studies with a longer intervention time so that the results are more trustworthy.

Author contributions

Regra GL was responsible for data collection, writing the results and final review of the article. Salerno GRF was responsible for writing the results and final review. Ressurreição K was responsible for data collection and analysis of results. Rodrigues E was responsible for the final review.

Competing interests

No financial, legal or political conflicts involving third parties (government, companies and private foundations, etc.) have been declared for any aspect of the submitted work (including, but not limited to, grants and funding, participation in advisory council, study design, preparation of manuscript, statistical analysis, etc.).

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