

A different approach to the use of elastic bands in the recovery of lower lumbar discopathy

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Abstract

Lower lumbar discopathies are in continuous growth among both young people and elderly. Causes that have led to an increase in the incidence of this pathology include: lack of exercise, nutrition, excessive use of computers and mobile phones, etc. The increased incidence of pathology led us to identify an attractive kinetotherapeutic treatment protocol that initially reduced the symptoms of this condition, and subsequently allowed the patients' complete recovery.

The present study was conducted on 33 patients diagnosed with lower lumbar discopathy. They received two evaluations, and between these, the patients performed a kinetic program consisting of elastic band exercises along with general neuroproprioceptive muscle relaxation techniques.

The data obtained were inventoried and processed using statistical programs. The comparison of the initial and final results, as well as the data obtained from statistical processing showed an improvement of the symptomatology and the orientation of patients towards a complete recovery.

Key words: lower lumbar discopathy, elastic bands, treatment protocol, statistical analysis

Introduction

The 21st century has come with a technological explosion that facilitates both personal and professional life, but like any help provided, it is accompanied by a number of side effects.

One of the most important side effects is the lack of exercise, which has led to a substantial increase in the number of lower lumbar discopathies. In order to rapidly reintegrate patients into social and professional activity, therapists resort to different treatment methods. One of these methods used by therapists is treatment with elastic bands. This treatment is very popular and is designed to improve muscle function and performance, to increase joint mobility, reduce pain and muscle fatigue, etc. (1, 2). It has been shown that exercising with elastic bands increases strength, muscle mass, joint mobility, bone density, etc. (3, 4, 5, 6, 7). Bergquist also demonstrates that elastic bands are a good alternative to free weights, and Janusevicius D. claims they are even superior to weight-bearing exercises (8, 9). The combination of elastic bands and general neuroproprioceptive facilitating techniques brings a qualitative increase in the recovery program (10).

Materials and methods

The study was conducted on a group of 33 male and female patients aged between 35 and 60 years. Prior to entering the recovery process, all patients were diagnosed with lower lumbar discopathy by rheumatologists.

All 33 patients received 2 evaluations (initial evaluation before the kinetotherapeutic program and final evaluation after the kinetotherapeutic program). Patient assessment consisted of analyzing pain experienced by patients based on the Visual Analog Scale (VAS), where the patient had to score the symptom felt from 1 to 10 (0 - no pain and 10 - unbearable pain) (11, 12, 13).

In addition to VAS, the patients also performed two functional tests: the finger-ground test and the Schober test. These functional tests are designed to evaluate the mobility of the spine, which is a determining factor in the disease (14).

After the initial testing, patients attended a recovery program performed exclusively with elastic bands. The program lasted 2 weeks (10 working days), and was composed of exercises with elastic bands from fundamental positions and derived from

fixed scale exercises. The dosing of each exercise varied according to the patients' age, so that patients aged 35 years had a greater number of repetitions than older patients.

After completing the kinetic program, patients underwent the final assessment (consisting of Visual Analog Scale (VAS), finger-ground test and Schober test) under the same conditions as the initial testing.

The data obtained from the initial and final evaluation were statistically processed using the IBM SPSS Statistics 19 and Statistics 7 applications (15, 16).

Results

Table 1 exemplifies the initial and final values for 10 of the 33 patients participating in the study and explains how the patient data were collected and the baseline values to be reported.

Table 1. Initial and final evaluation

Subject s	VAS (initial)	VAS (final)	Finger ground test (initial) cm	Finger ground test (final) cm	Schober test (initial) cm	Schober test (final) cm
1	8	5	20	18	1.5	2
2	7	3	19	18	1	1
3	8	6	18	13	2	3.5
4	6	2	8	8	2	2
5	5	3	8	7	2	2.5
6	8	5	17	15	3	3
7	7	5	14	10	2	3
8	6	3	7	7	4	4
9	8	6	18	14	1	2
10	8	5	18	11	1	3
-	-	-	-	-	-	-

After processing the initial and final evaluations with the statistical programs, as shown in Table 2, there was a decrease in the minimum value obtained from 5 to 2, and the maximum value also dropped from 9 to 7.

Table 2. VAS – initial and final evaluation

	N	VAS (initial)	VAS (final)
	32	32	32
	0	0	0
Mean		7.3750	4.1875
Std. Deviation		1.12880	1.28107
Skewness		-.099	.216
Std. Error of Skewness		.414	.414
Kurtosis		-.897	-.765
Std. Error of Kurtosis		.809	.809
Minimum		5.00	2.00
Maximum		9.00	7.00

It can be seen how the skewness coefficient indicates a value of $-.099$, which means a negative asymmetry, and after treatment, it changes to become a positive skewness index of $.216$ indicating a positive asymmetry with an inclination to the left but values to the right. This together with the average decrease from 7.37 (initial evaluation) to 4.18 (final assessment) confirms the positive results obtained by patients following the treatment protocol.

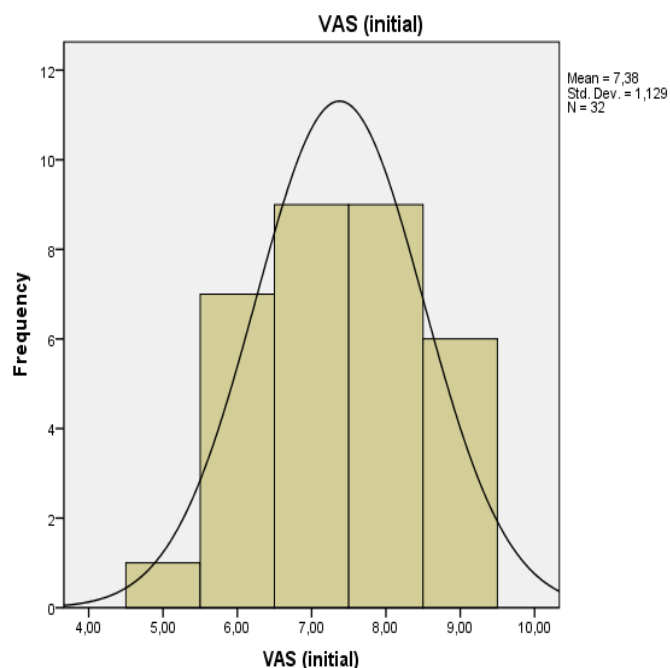


Fig. 1. VAS – initial evaluation

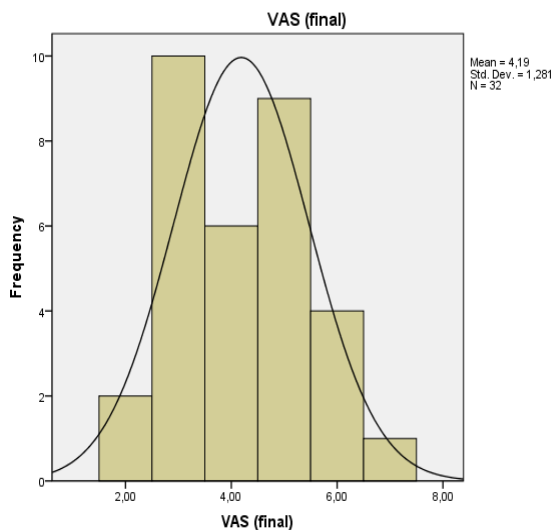


Fig. 2. VAS – final evaluation

The coefficient of kurtosis presented in Fig. 1 shows a platykurtic distribution with $-.897$, and after treatment, as observed in Fig. 2, this kurtosis coefficient has a normality trend indicating a value of $-.765$. The proposed protocol has brought an improvement of $.132$ in this coefficient, thus indicating the quality of the proposed treatment.

The finger-ground test, represented by Table 3, shows how the minimum value decreases from 7 cm to 5 cm and the maximum value from 21 cm to 19 cm. This indicates an increase in spine mobility by at least 2 cm. This increase in spine mobility evidences an improvement in the symptoms generated by lumbar discopathy by reducing pain experienced by the patient (Table 1) and eliminating the contractions caused by it.

Table 3. Finger-ground test – initial and final evaluation

		FGt (initial)	FGt (final)
N	Valid	32	32
	Missing	0	0
Mean		13.8750	11.1563
Std. Deviation		4.57024	3.92765
Skewness		-.176	.376
Std. Error of Skewness		.414	.414
Kurtosis		-1.427	-.904
Std. Error of Kurtosis		.809	.809
Minimum		7.00	5.00
Maximum		21.00	19.00

Also, the skewness coefficient indicates a value of $-.176$, which means a negative asymmetry. The proposed treatment plan brings a significant difference of $.552$ in this coefficient, from $-.176$, as indicated by the initial evaluation, to $.376$, as indicated by the final assessment (Table 3).

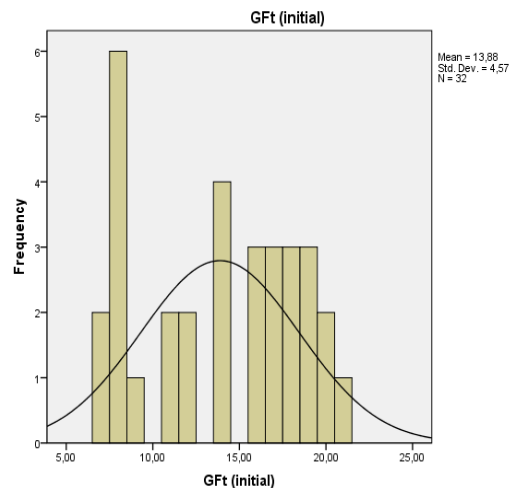


Fig. 3. Finger-ground test – initial evaluation

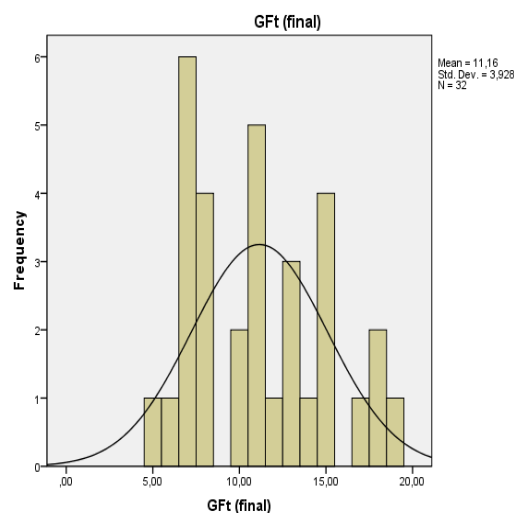


Fig. 4. Finger-ground test – final evaluation

The coefficient of kurtosis indicates a platykurtic distribution both in Figure 3 and Figure 4, but the difference between the two figures is given by the value of -1.427 obtained at the initial assessment and the value of $-.904$ obtained at the final assessment. The difference of $.523$ shows the trend of this normalization coefficient.

Table 4, representing the processing of the results obtained in the Schober test, indicates a change in the maximum value from 4 cm to 5 cm. This confirms the results of the finger-ground test and also shows an improvement in the symptoms generated by lumbar discopathy through: an increase

in mobility, elimination of pain experienced by the patient, and disappearance of contractions in the lumbar region.

Table 4. Schober test – initial and final evaluation

		Schober test (initial)	Schober test (final)
N	Valid	32	32
	Missing	0	0
Mean		2.0469	2.8125
Std. Deviation		.95343	.92239
Skewness		.393	.134
Std. Error of Skewness		.414	.414
Kurtosis		-.952	.205
Std. Error of Kurtosis		.809	.809
Minimum		1.00	1.00
Maximum		4.00	5.00

The skewness coefficient obtained at the initial evaluation indicates a value of .393, which means a positive asymmetry, but after treatment, this coefficient changes to a normal asymmetry (0), indicating a final value of .134.

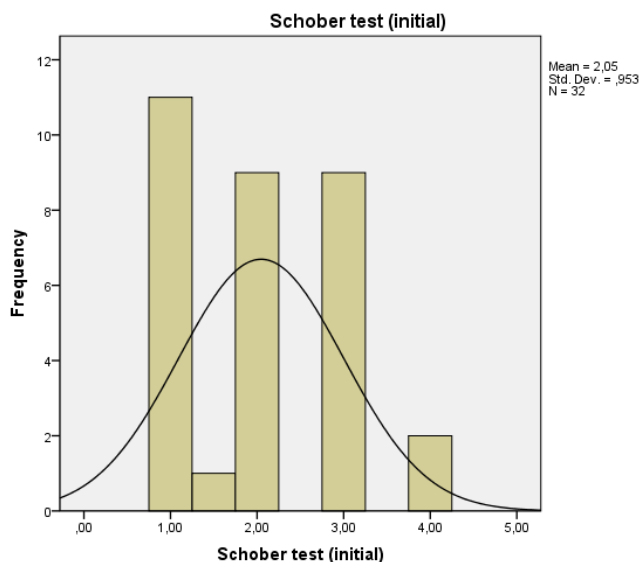


Fig. 5. Schober test – initial evaluation

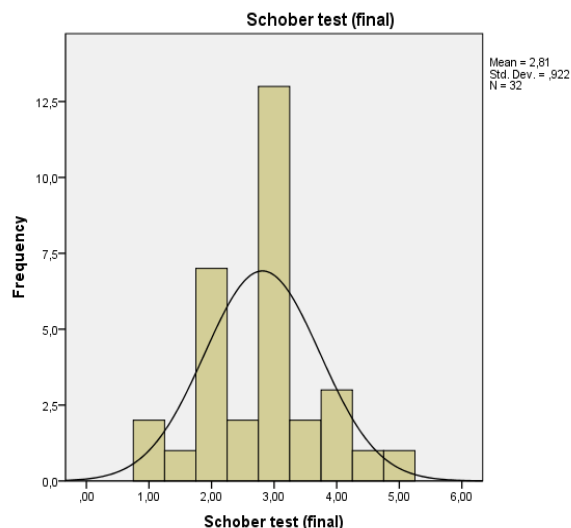


Fig. 6. Schober test – final evaluation

The coefficient of kurtosis shows in Figure 5 a platykurtic distribution with $-.952$, and after treatment, an important change in this coefficient is seen, which acquires a leptokurtic distribution having the value of $.205$, slightly exceeding the mesokurtic distribution (a distribution considered normal and represented by 0). This difference of 1.157 shows the quality of treatment performed in patients suffering from lower lumbar discopathy.

One thing observed during all evaluations is the constant value of the standard parameters. Error of kurtosis = $.809$ and standard error of skewness = $.414$.

Conclusion

After comparing the results, it can be said that the therapeutic plan consisting of exercise with elastic bands has positive effects in the recovery of lower lumbar discopathy.

The registered parameters showed an improvement in symptomatology and an increase in lumbar range of motion which led to an increase in patients' quality of life by reducing the symptoms of this illness, by giving them the opportunity to perform their day-to-day work without feeling pain in the lumbar spine. With the increase in the quality of life of patients, there was also an economic growth allowing patients to reintegrate more quickly into professional activity.

The use of graphical interfaces helps the reader to better understand the results.

Declaration of conflict of interests

There is no conflict of interest for any of the authors regarding this paper.

Informed consent

An informed consent was obtained from the patients included in this study.

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