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Bowen Technique for patients with low back pain

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ABSTRACT

Non-specific lumbar spine pain syndromes (nslsp) are currently the most common ailment. There are many physiotherapeutic methods that reduce pain and improve the functional status of patients. One of them is Bowen Technique (BT), which is a little-known fascial therapy and is characterized by a holistic approach to the patient. The aim of the study was to assess the effectiveness of BT in patients with non-specific lumbar spine pain syndromes. We examined 50 patients aged 25-60 (the average age was 39.92, SD ± 9.510, median 37.0). An interview was conducted with each patient. Functional examination based was done four times. It included Revised Oswestry scale, Low Back Pain Disability Scale measurements of the range of motion of the lumbar spine and Visual analogue scale (VAS) was used to describe the pain of patients. Eeach patients attended into three procedures of Bowen Therapy. The pain in the lumbar spine decreased after the first TB and its level is constantly reduced with each subsequent procedure. Analyzing all subjects, statistically significant differences were visible between the state before therapy and each subsequent examination, as well as between the first and the third treatment. In the subjects, the health condition is improved, and more precisely, the intensity of pain, the frequency of its occurrence and the increase in independence were reduced. A study showed that there was a statistically significant improvement in patients' health due to therapy. The ranges of motion of the lumbar spine as a result of the therapy increased. The assessment of TB therapy after the first treatment is mostly good, and after the third 66% of respondents assess as very good. The number of patients who are very satisfied with the effectiveness of the treatment increases from the procedure to the procedure.

***Keywords*:** Bowen Technique, Bowtech, non-specific lumbar spine pain syndromes, lumbar spine pain

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1. INTRODUCTION

Lumbar spine pain is described as the pain located in the lower part of the spine (lumbar-sacral), coming from this area and optionally radiating to one or both lower limbs. It occurs in a great amount of the population, in about 80% of people and it has a different intensity. In a situation where there is no pathology within the spine such as cancer, osteoporosis, trauma or fracture, this kind of ailment is treated as a non-specific lumbar spine pain syndrome (nslsp). [1-4]

There are many physiotherapeutic methods that reduce pain and improve the functional status of patients. One of them is Bowen Technique - BOWTECH (TB), which is a little-known fascial therapy and is characterized by a holistic approach to the patient. TB is a form of manual therapy that was created by Thomas Bowen in the 1950s. It is a fascial vibrational technique, based on a delicate movement and a series of manipulation of soft tissues. [5] Currently, TB is described as a system of information that is sent to the patient's body from precisely defined points located on his body, and then transmitted in the form of vibrations by the nervous system and perceived as stimuli to initiate systemic repair processes. The effect of rolling movement characteristic of this method is muscular and fascial loosening. [6]

Until now, the effects of TB therapy have been most often described in the form of a case study. It is difficult to find research conclusions from such works. However, the case reports allow the conclusion that TB is used in a manner that is individually tailored to the needs of each patient. The review of the work on TB published in 1985 - 2009 shows that therapy with this technique is non-invasive and aimed at improving health. Over half of the completed studies (53%) showed that TB is effective in reducing pain, and 33% of them indicate improved mobility. Several studies demonstrate the effectiveness of this therapy in the treatment of symptoms in patients suffering from chronic diseases, such as, for example, multiple sclerosis. [7] Researchers from the last 10 years are very diverse and it is difficult to provide generalized conclusions. Taking into account the pain criterion, these are two studies which are recommended. The first one is carried out in patients after total knee arthroplasty. The results of the study indicated that in patients undergoing two treatments between 2 and 10 days after surgery, the pain in the first two days significantly reduced. The next study is "A pilot study on the use of TB as a treatment for people living with chronic, nonspecific low back pain". The results indicated that in the experimental group there was an improvement in all categories - 20, and in the control group in 12. [8] Taking the scope of motion as a criterion, the study deals with the effect of one-off TB therapy on the flexibility of hamstring muscles during one week. Thanks to one therapeutic session, there is an immediate increase in the flexibility of the above-mentioned muscle groups and this condition lasts for a week without additional intervention. [9] There is also a pilot study about the group of patients who have suffered from a stroke. In terms of the high motility test, a statistically significant improvement was demonstrated. The same is true for the well-being, the sphere of social life and the strength of the hand grip. [10]

There are several theories that describe the way that TB influence on the body. Some of them referred to embryonic development, autonomic nervous system, joint prihi-receptors, stretching reflex, segmental skin and visceral reflex, harmonious vibrations, resonant model, trigger and acupuncture points, meridians. Due to the fact that they do not yet have a scientific background, they are hypotheses for further research on this therapy. Based on a number of

studies on the skin, fascia and effects of manual therapy, the concepts of pioprioception and interoception best describe the mechanism of action of TB so far. [7]

The skin is innervated tissue and has various types of receptors that detect changes during the position of touch, pressure, vibration, temperature or pain. The most important functions of the skin is: communication of the external and internal environment of the body, thermoregulatory mechanisms, maintenance of water and electrolyte balance, immune response protecting against pathogens, as well as reacting with physical, chemical and thermal pathogens. The skin adheres to the subcutaneous and superficial fascia, and these in turn connect to the deep fascia. [7] Thanks to this construction, the fascia also plays the role of a system for collecting, transmitting and processing information. [11] It is strongly innervated by myelinated nerve endings that have proprioceptive function, i.e. "the ability to feel the position, orientation and movements of the body and its parts". [12] An exemplary structure that transmits information between the skin and the skeleton are the so-called Heine cylinders. [8] In addition, there is collagen, elastin and reticulin in the extracellular space of the superficial fascia, which also allow connections with deep fascia and skeleton. Adipocytes and fibroblasts, on the other hand, are responsible for mechanotransduction and lead to a wide range of sensory sensations and communication signals. Therefore, it has been suggested that the contact of the therapist's hands with the patient's skin initiates communication with structures lying deeper. [13] It is said that the nervous system of human being has such an organization that it involves the sensory nerves more than the motor nerves. [14]

Interpeption determines the feeling of physiological body condition and covers a wide range of physiological sensations, among others muscular effort, touch or vasomotor feelings. In general, it refers to the homeostatic needs of the body and is related to the motivation of behaviors that are key to maintaining the physiological integrity of the body. It has been proven that some of the free nerve endings are mechanoreceptors located in the scalp, conducting changes that include mechanical stimuli, i.e. light touch, pressure or stretching. [15] Part of the interoceptive nerve endings located in the muscles is referred to as ergoreceptors. Their role is to transmit information about the load intensity in local parts of the muscle to the insular cortex. Mechanical stimulation of these receptors causes changes in the bandwidth of the sympathetic nervous system, which in turn increases local blood flow. [16] Other interoceptive nerve endings - increased hydration of extracellular matrix. For this reason, it is beneficial to observe the patient's autonomous and limbic-emotional reflexes during the procedure of BT. By monitoring the direction of movement, its speed and strength, you can notice significant changes in local tissue hydration and achieve an autonomous effect. [16]

In general, the mechanism of action of BT is based mainly on the numerous free nerve endings and light touch receptors in the skin and superficial fascia. Autonomous nervous system pathways between skin and skeleton may explain the mechanism of profound changes occurring after therapy. [7] The free nerve endings referred to above go into the ascending pathways and run to the bark of the insular cortex, which is involved in the projection of consciousness, and also participates in the emergence of emotions and homeostatic control of the body. The main functions of the insula are: perception, motor control, self-awareness, participation in cognitive processes. [7] Proprioceptive sensation is the first reaction of the body after and while BT. Interoceptive ones are more delicate and easier to feel during periods of several-second intervals between individual movements. Subjective feelings such

as warmth, lightness / heaviness, pulsation, spontaneous sensations or overall well-being, are indicative of interoceptive sensations that can be triggered by myofascial stimulation. [16].

2. EXPERIMENTAL / RESULT

2. 1. Method

The study group consisted of 50 patients. All of them agreed to participate in the research. Only patients for whom the period from any last treatment was above 1 month were enrolled in the study. Participants of the study were asked not to take any medicines during the course of therapeutic treatments. We excluded Patients who were diagnosed with "red flags", who have many concomitant diseases, serious neurological disorders (eg epilepsy, post-stroke, Parkinson's disease, MS, amyotrophic lateral sclerosis) and cardiac (m. other post-infarction conditions).

The tests were performed four times at intervals of 7-10 days. The first was a test before the start of therapy, the second one was performed before the second treatment and allowed to evaluate the effectiveness of the first treatment. Similarly, the third study was performed before the third treatment and evaluated the effects after the second treatment. The fourth study was final. Each patient underwent three procedures during which specific procedures were carried out:

- I procedure - “Bowen Relaxation Moves”
- II procedure - “Kidney Procedure”
- III procedure - “Hamstring Procedure”

An interview and functional examination with each patient were carried out. The intensity of pain was assessed using the visual-analogue scale (VAS). The level of impairment was described according to Oswestry scale. The measurements of the range of motion of the lumbar spine was also performed. The examination was carried out after each session of treatment (the second, third and fourth procedure).

Physical examination included such information as gender, age, body weight and height. The type of work currently performed by the patient and the number of working hours per day were also taken into account. We also asked about the general health condition, about coexisting diseases and the number of incident of back pain syndromes. During the interview information on the topography and duration of symptoms of the current nonspecific lumbar spine pain was collected.

The physical examination covered 4 issues. The first is the VAS scale - Visual Analogue Scale. A patient should note in a scale from 0 to 10 how she or he recognized the level of her or his pain. "0" means no pain, and "1" the weakest pain. The result of 2-3 weak pain, 3-6 pain of medium intensity, 6-9 pain strong, and "10" - unbearable pain. [17] The Revised Oswestry Low Back Pain Disability Scale is a 10-point scale, which is devoted for patients with painful ailments of the lumbar spine. The questionnaire contains the following areas: pain intensity, care (daily hygiene), lifting, walking, sitting, standing, sleeping, socializing, traveling and changing the intensity of pain. [18] Patients answered the questions, outlining the responses indicating their condition, respectively. Answers were summed up, converted into percentages and described in the scale from 0 to 5:

- I group (0-20%) - minimal “disability”

- II group (20-40%) - moderate “disability”
- III group (40-60%) - serious “disability”
- IV group (60-80%) - “disability”
- V group (80-100%) - person lying [18]

The ranges of motion in lumbar spine mobility were measured. It was made with a centimeter tape with an accuracy of 0.5 cm, according to generally accepted rules. [19] At the end of each treatment session, we asked about subjective opinion of the therapy. During the interview, the patients were also asked if they felt the improvement of their condition after the therapy. Each patient could answer that she/he feel after therapy “very good”, “good” or “not satisfied”.

2. 2. Study group

The research group consisted of 50 people: 40 women (80%) and 10 men (20%), aged from 25 to 60 years (the average age was 39.92, SD ± 9.510, median 37.0). There was 52% respondents in the age of 35-49, and 16% over 50 year old. The basic somatic features of the subjects are presented in table 1 in the form of a cross-section of descriptive statistics.

Table 1. Statistical analysis of the basic somatic features of the subjects. [own source]

	M	SD	Min	Maks	Q1	Me	Q3
Age	39,92	9,510	23	60	32,8	37,0	47,0
Body weight	69,64	14,412	46	98	57,0	66,5	80,5
Height	168,70	8,749	152	187	162,0	167,5	178,0

M - medium; SD - standard deviation; Min - minimum value; Max - maximum value; Q1 - lower quartile; Me - median; Q3 - upper quartile

BMI indicated a “normal weight” had 46% of respondents and an “overweight” 38%. Only 10% of patients were “underweight” and 6% were “overweight”. 90% of respondents were professionally active people. Among them, 79% did mental work and 29% did physical work. 50% of professionally active people performed sitting work, 17% standing, and 33% standing-sitting. The subjects worked an average of 8.15 hours per day (SD ± 1.502, median 8.0), a minimum of 5, and a maximum of 12 hours a day. The vast majority of respondents - 68% described their health as good, and half of them pointed to various types of comorbidities (including spinal problems, pain in the limbs and joints, hypertension, headache and dizziness). For 12% of respondents it was the first pain syndrome in the lumbar spine in life. The rest part of research group had such incidents already, and 40% of the respondents had more than 10 times. Earlier diagnoses included pain syndromes (63% of respondents), discopathy (53% of subjects) and degenerative changes (43% of subjects). Previously, they used mainly physical therapy, kinesitherapy, massage and pharmacotherapy. 11% of respondents already used BT therapy before. Current lumbar spine pain in 52% of subjects have been present for at least 13 weeks and 34% less than 6 weeks. Topographically, the

symptoms mainly included the lumbosacral spine. In some patients, the pain was radiating to the thighs and / or knees and / or calves and / or feet.

2. 3. Statistical analysis

Calculations are made in the Statistica 12 software by StatSoft, StatXact from Cytel and GraphPad InStat from GraphPad Software. The significance level is assumed to be $\alpha = 0.05$. The result is considered statistically significant when $p < \alpha$. In order to investigate whether the changes in time of the analyzed parameters are statistically significant, the Friedman test is calculated (for variables measured on an ordinal or interval scale with no compliance with the normal distribution). When determining significance, the Dunn test of multiple comparisons is used to assess which changes are significant. To determine whether there are significant differences in the parameters analyzed between the groups, the Kruskal-Wallis test is calculated. In turn, Dunn's test of multiple comparisons allows to determine which groups differ from each other. In the case where there is a correspondence with the normal distribution and the variances are equal, the analysis of variance for unrelated samples is calculated.

2. 4. Results

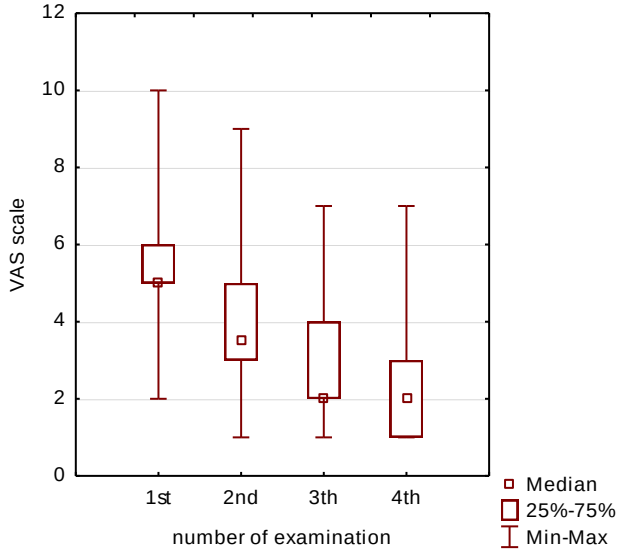


Figure 1. The severity of pain in the VAS scale. [own source]

During the first study, 44% patients aasessed their lumbar pain on the VAS scale an average point value of 5 ± 2 (median 5, range: 2-10) which was classified as 'moderate intensity pain'. In the second study, the mean intensity of pain in the lumbar spine in the whole group decreased to 3.66 ± 1.912 (median 3.5, range: 1-9). The third study showed pain at an average level of 2.80 ± 1.498 (median 2.0, range: 1-7). In the last study, mean pain intensity decreased to 2.32 ± 1.647 (median 2.0, range: 1-7), and in 42% of patients the pain was the weakest. The severity of pain in the lumbar spine decreased after the first BT procedure and its level is constantly reduced with each procedure. Analyzing all subjects, the

differences in the intensity of pain in the VAS scale as a result of treatments are statistically significant (p <0.00001). Differences are not visible only between the third, second and fourth tests.

In the first study, the mean result obtained by the respondents on the Oswestry scale was 35.64% ± 13.375. In this study, 56% of respondents were assigned as moderate "disability". In the second study, the average number of points was 23.56 ± 13.870. During this time, 48% of respondents were classified as "minimum disability". During the third test, the average point gained by respondents was 18.84 ± 13.359. In the 58% of the respondents, "disability" was minimal and 38% moderate. Only 4% of patients still had "disability" at a serious level. After the end of therapy, the mean value decreased to 14.20 ± 13.542. The "minimum disability" occurred in 74% of respondents, moderate in 20% and serious in 6%.

The trend study allows to determine what percentage of respondents as a result of therapy reached each levels of "disability". We could made such an interpretation of the results:

- "Statistically significant" - (p <0.0001) the number of persons with "minimal disability" increased (chi2 test for the trend). We suggested that the patient's health improved as a result of the therapy.
- "Significantly", the number of people with "moderate disability" (chi2 test for the trend) decreased (p = 0.0004).
- "Significantly", the number of people with "severe disability" (chi2 test for the trend) decreased (p = 0.0040). It results from the fact that as a result of the therapy, the patients' health improved, because from the second study there were no longer people qualified as the group of "disability" in general.

Patients in research group were divided into two groups. The first is "less disabled" people referring to Oswestry scale ≤ 40%, and the second is people with "more disability" according to Ovestra> 40%. The analysis of the results shows that the number of people described as "minimal disabled" or "moderate disabled" increased (p = 0.0001).

Comparing the median results in the study of the degree of "disability" with the Oswestry scale, a declining trend is noticeable. Changes due to treatments are statistically significant (p <0.00001). The differences are not visible only between the third and second tests, and the fourth, just as it looks at the VAS scale.

Referring to the results of the "disability" on the Oswestry scale, the changes due to the treatments were statistically significant (p <0.00001). The differences were not visible only between the third and second tests, and the fourth, just as it looks at the VAS scale.

As a result of BT procedures, there was a statistically significant increase in the range of motion in lumbar spine in each of the examined anatomic planes comparing the condition of patients before the therapy to the post-treatment condition. We presented the results for each directions Table 2.

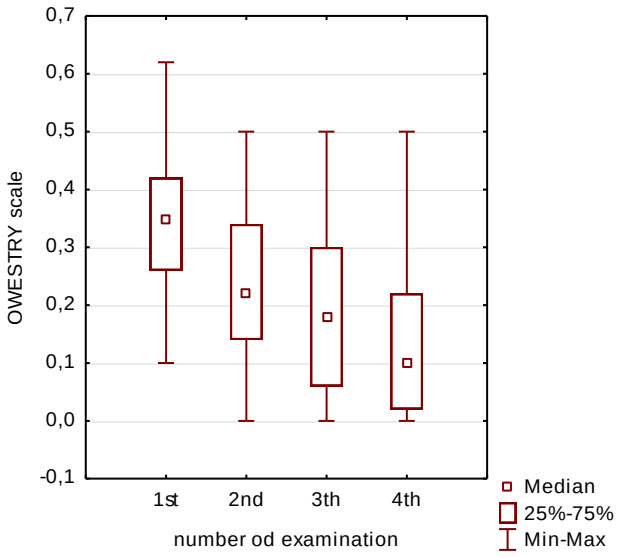
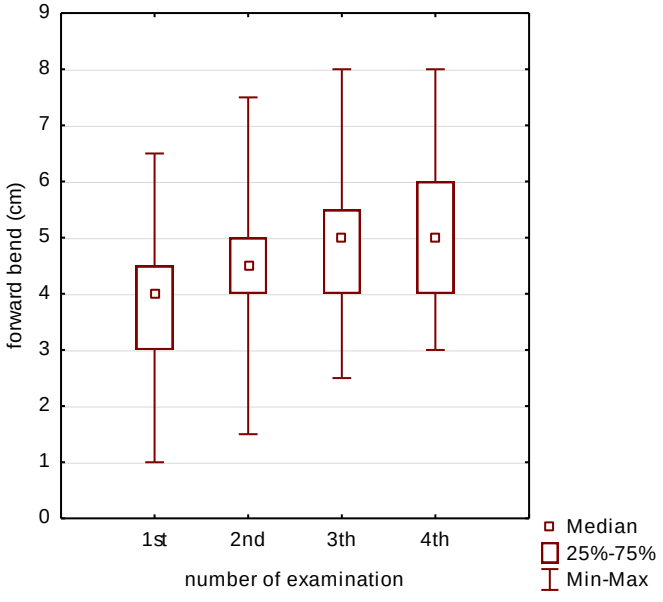
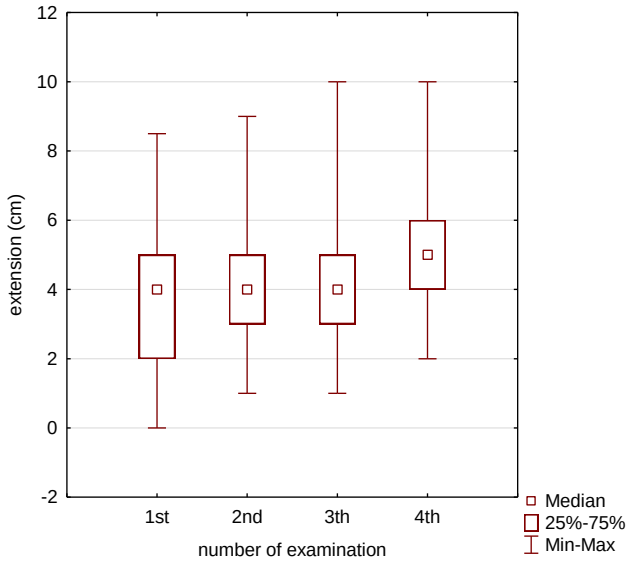
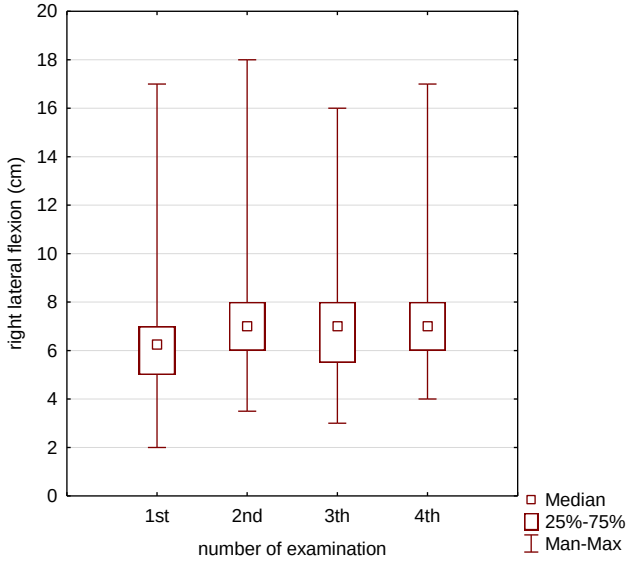
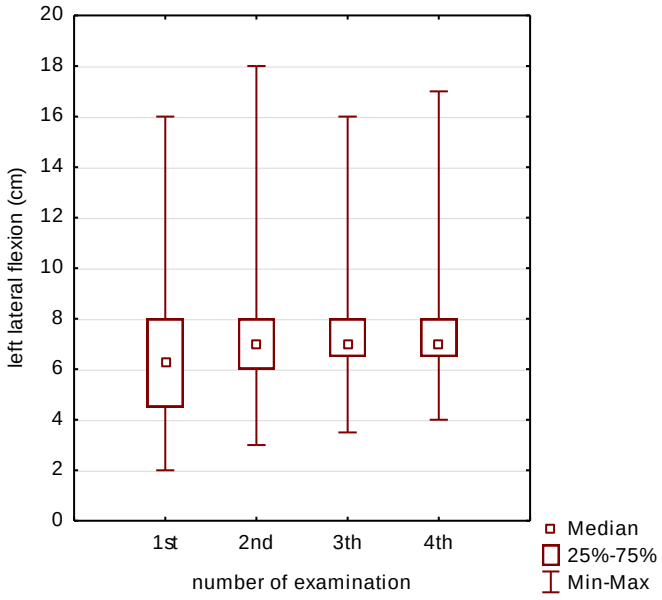
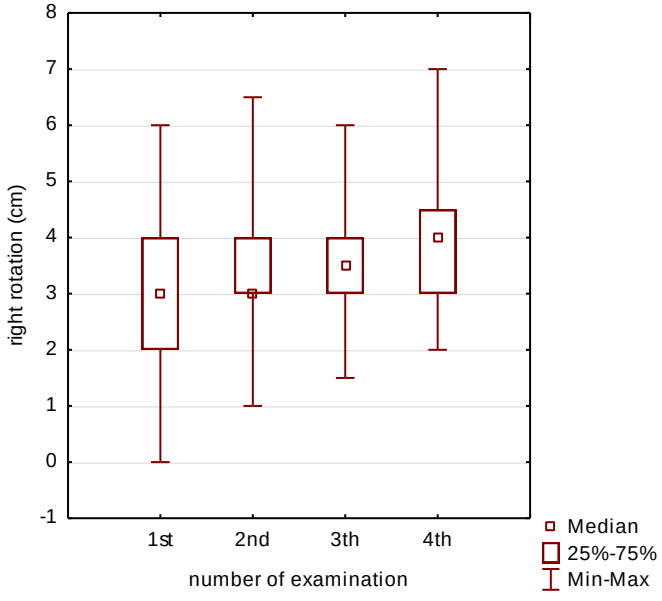


Figure 2. Assessment of "disability" caused by pain in the lumbar region of Oswestry. [own source]

Table 2. Measurement of the range of motion of the lumbar spine and description of changes [own source]

The mobility	Figure	Description of change of range of motion
Squad in forward direction	 **Figure 3.** Changing the range of motion in squad forward in lumbar spine (centimeters). [own source]	Statistically signifcant changes (p<0,0001).

The mobility	Figure	Description of change of range of motion
Squad in backward direction	 **Figure 4.** Changing the range of motion in backward squad in lumbar spine (centimeters). [own source]	Statistically signifcant changes (p<0,0001).
Side bending in right direction	 **Figure 5.** Changing the range of motion in side bending in right direction in lumbar spine (centimeters). [own source]	Statistically significant changes (p=0,00022).

The mobility	Figure	Description of change of range of motion
Side bending in left direction	 **Figure 6.** Changing the range of motion in side bending in right direction in lumbar spine (centimeters). [own source]	Statistically significat changes (p=0,00162).
Rotation into right direction	 **Figure 7.** Changing the range of motion in rotation into right direction in lumbar spine (centimeters). [own source]	Statistically significant changes (p=0,00004).

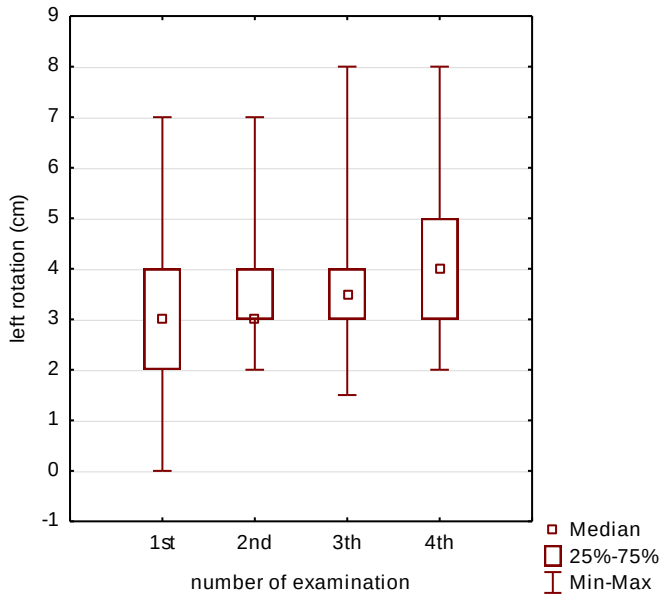
The mobility	Figure	Description of change of range of motion
Rotation into left direction		Statisctically significant changes (p=0,00001).

Figure 8. Changing the range of motion in rotation into left direction in lumbar spine (centimeters). [own source]

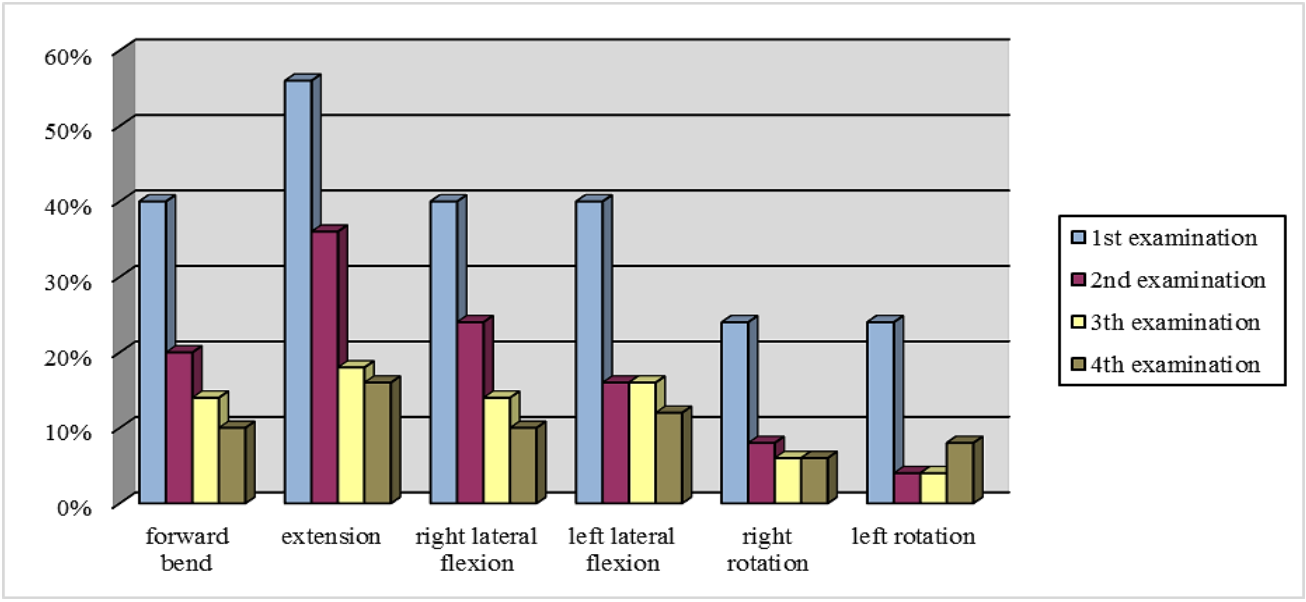


Figure 9. The occurrence of pain during the examination of the range of motion of the lumbar spine. [own source]

Referring to the range of motion in each of the directions of the lumbar spine the occurrence of pain showed a decreasing tendency (Figure 9), especially in extension movement. In the first study, pain occurred in 56% of subjects, in the second in 36%, in the third in 18% and in the last in 16% of research group.

Most of patients from research group subjectively assessed the effect of BT therapy after the first treatment as “mostly good”. Similarly, 66% of respondents gave a “very good” grade after the third procedure. Changes in the subjective assessment of Bowen Technique under the outflow of treatments are statistically significant ($p < 0.00001$) (Figure 10). After a thorough analysis of the data, the differences were not only seen between the third and fourth tests.

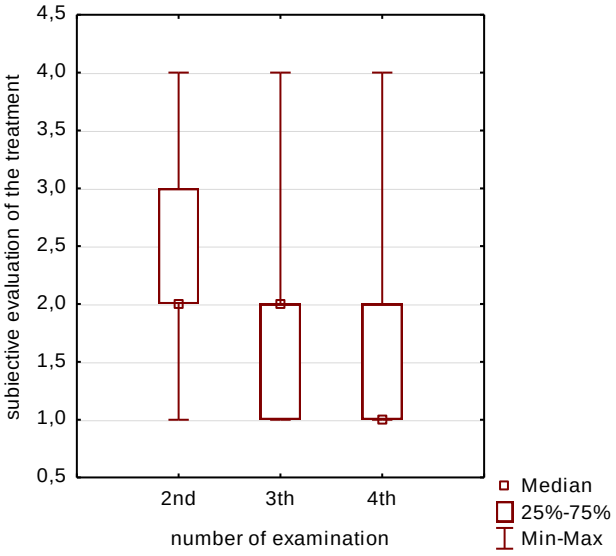


Figure 10. Subjective assessment of the patient's effectiveness of the Bowen Technique therapy. [own source]

3. CONCLUSIONS

Pain in the lumbosacral spine affects more and more amount of modern society. It is estimated that almost 80% of the population had at least one pain episode, and about 30-40% of the population had chronic pain and was one of the main reasons for patients' visits in rehabilitation rooms. [1-4] Analyzing the current lifestyle of society, with a significant reduction in physical activity, it is obvious that the problem will be increasing. It is well known in general acknowledge that the best solution is to prevent injuries, and if they have already occurred, the shorter the time after the problem, the better. Then the body will not develop compensatory mechanisms.

Bowen's technique is a specific form of therapy. The concept of treatment of patient according to BT is significantly different from the commonly known methods. The biggest difficulty in designing a significant research about the effectiveness of BT is the fact that each patient should be approached individually. The plan of BT for one patient may be an ideal solution for an individual, and for others it should be proposed totally different approach.

There are well known many explanation of effectiveness of procedures of BT especially for back pain. They are related to treatment of fascia. The result of the procedure is gaining the alignment of the body in pelvis, balance the forces of gravity, restoring the integrity of the tissues and reducing the sensitivity of the nerves in their course. The development of proprioception plays a major role here. [20]

The study is the first in Poland that shows the results of Bowen Technique. They are not yet fully exhaustive, although they may be the beginning for future researches. It would be beneficial to carry out the study on a larger group. We shows the effectiveness of Bowen Technique in non-specific lumbar spine pain syndromes. In general, we noticed the greatest improvement in health after the first treatment. There was clearly noticeable results in the severity of pain, the range of motion and the degree of disability of respondents referring Owestry standardized scale. It can be concluded that subsequent treatments would still eliminate pain and improve the health of patients whose symptoms have not yet completely resolved. When comparing the subjective opinion of patients, it can be concluded that although most of the respondents see a significant improvement in health after the first treatment, their subjective assessment is only the highest after the third treatment. This may indicate that initially patients are very skeptical about new therapy and have to become familiar with it, only to see the effects that are already visible after the first treatment.

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