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Subjective assessment of the effectiveness of physiotherapeutic methods in lumbosacral discogenic pain syndrome

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SUMMARY

Aging society, lack of habit shaping attitude to correct posture among children and youth and a lifestyle that often requires excessive effort make lumbosacral discogenic pain syndrome a social disease. It is essential that effective methods for the prevention and treatment of these changes go hand in hand with the frequently occurring pains of the lumbosacral spine.

Aim of the study: Comparison of the subjective assessment of the patient's feelings related to the lumbosacral discogenic pain.

Material and method: The research group included 60 people diagnosed with a lumbosacral discogenic pain. All patients were divided into three groups of 20 people. Each group was subjected to a different type of rehabilitation, depending on the method analyzed - PNF, manual therapy, and physical treatments. The questionnaire was used as the research tool, it was filled in by the respondents.

Results: The patients, before and after the treatments, regardless of the type of rehabilitation to which they were subjected, declared that the most common pain is in the buttock, thigh and calf. Before the rehabilitation, the most frequent additional complaints of the examined patients were numbness and muscle weakness, after rehabilitation it was muscle weakness. After the rehabilitation, the number of painkillers taken by the respondents decreased. Only in the case of patients who underwent physiotherapeutic procedures, the number of people taking medication increased.

Conclusions: The best results from the analyzed therapies were obtained after manual therapy. The second most effective was PNF therapy, while the weakest result was achieved by physiotherapeutic procedures.

Keywords: pain, lumbar spine, manual therapy

INTRODUCTION

Although the evolution of an upright posture by a man, allowed for faster and more efficient movement, it also put a higher strain on the spine. The range of movements in the cervical and lumbar sections also increased, which is why these two sections of the spine are the most vulnerable to the occurrence of pain.

The modern lifestyle, especially the habits of youth, the nature of modern work or incorrect posture are responsible for the lumbosacral discogenic pain syndromes as it becoming a social problem affecting a growing number of young people.

The author's own interests and the wish to compare the subjective assessment of patients regarding the effectiveness of selected methods in the fight against pain in the lumbosacral spine were the motivation for the research. In addition, there are no publications or papers on the comparison and evaluation of treatments for lumbosacral discogenic pain syndromes. This paper is to fill this gap and become a contribution to further research on the effectiveness of treatment of lumbosacral discogenic pain in particular facilities.

AIM OF THE STUDY AND RESEARCH QUESTIONS

The main aim of the study is to analyze the evaluation of physiotherapeutic procedures in the lumbosacral discogenic pain syndrome. For this purpose, three methods of treatment have been compared:

- PNF method,
- manual therapy
- physiotherapeutic treatments.

The research objective will be achieved by answering the following research questions:

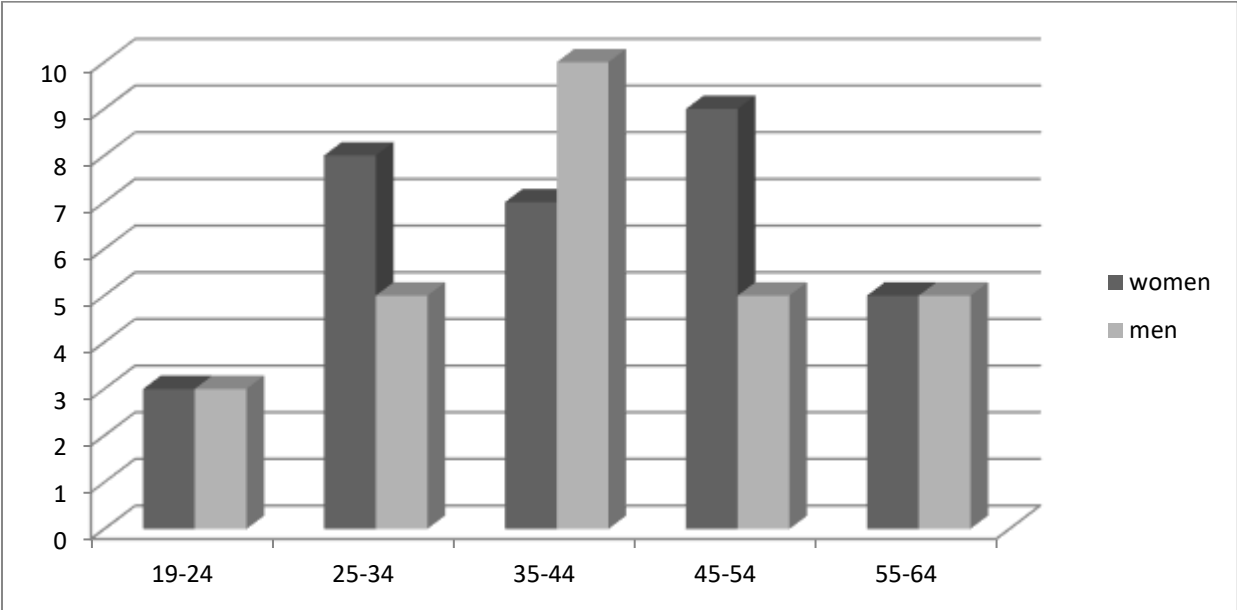
1. Do patients experiencing pain in the lumbosacral segment feel pain in other parts of the body?
2. What are the most common additional ailments of people with lumbosacral discogenic pain syndrome?
3. Which of the analyzed therapies gave the best results?
4. How do patients assess the effectiveness of the treatment they have been subjected to?
5. Did the amount of painkillers taken by the subjects decrease after the therapy?

MATERIAL AND METHODS

The research material included 60 people with diagnosed lumbosacral discogenic pain syndrome. The research excluded oncology patients who had neurosurgical procedures on the lumbar spine.

Chart 1 presents the gender and age structure of the respondents, 47% of whom were men aged 19-64, while 53% of the respondents were women between the ages of 21 and 64.

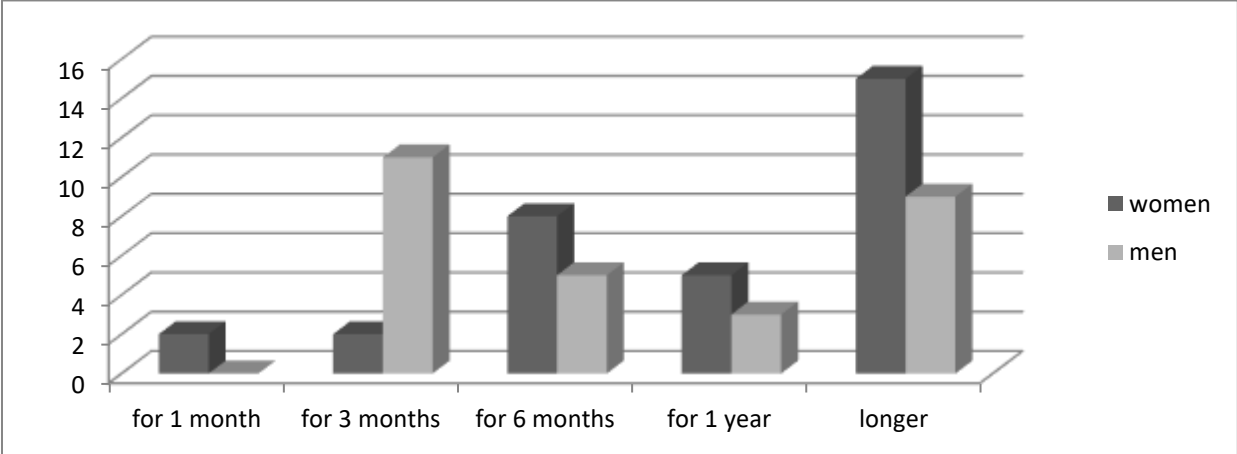
Chart 1. Structure of gender and age of all subjects.



Source: own study

Chart 2 shows the length of time when patients experienced pain. 42% of all respondents have experienced pain for more than a year. Only two people experiencing some pain for a month have gone to a specialist.

Chart2. The period of time when the patients felt pain.



Source: own study

All patients were divided into three groups of 20 people. Each group was subjected to a different type of rehabilitation, depending on the method being analyzed. All respondents answered the

same questions in the survey questionnaire. Responses to the research questions enabled the research to be carried out with the help of a standardized questionnaire, filled in by the respondents. It is one of the basic research tools used in social sciences, but it can also have its application in other areas, where quantitative research is conducted. It is widely used in experiments, field studies and data collection.

The questionnaire used in the study consists of 8 closed questions, in the case of a study carried out before rehabilitation procedures and 10 closed questions (questions 9 and 10), in case of research carried out after rehabilitation. The questions asked in the questionnaire concerned the type and intensity of pain, taking painkillers, assessing their overall health and assessing the effectiveness of the rehabilitation method which was used.

QUESTIONNAIRE

1. Age Gender
2. Type of work performed,
physical
mental (sitting)
mixed
3. Please enter your height.....
4. Please enter your weight.....
5. How often do you undergo treatment?
 - Every day
 - wice a week
 - 3 times a week
 - Less frequently
6. How long does the rehabilitation last during the day
 - up to 15 minutes
 - up to 30 minutes
 - up to 45 minutes
 - up to an hour and more
7. How long have you felt pain?
 - For 1 month
 - For 3 months
 - For 6 months
 - For 1 year
 - Longer.

Questions asked to the patient before and after 10 rehabilitation procedures

1. Where do you feel pain, in addition to pain in the lumbosacral segment? (please tick one answer, where the pain is dominant)

- Only the lower part of the spine hurts
- Buttocks
- hips
- Knee
- Calf
- Foot
- Nothing hurts

2. Please specify at what time of the day the pain usually occurs

- in the morning
- in the afternoon
- in the evening
- often at different times
- all the time

3. In which positions does the pain most often occur

- When sitting
- When standing
- When walking
- When working

4. How would you describe the pain?

- Lancinating
- Burning
- Stinging
- Blunt
- Other (what?).....

5. In addition to the pain, do you have the following symptoms (please mark the one that causes the most discomfort)

- Muscle palsy
- Muscle weakness
- Numbness
- Sensory disorder
- Other (what?).....

- I have no other symptoms

6. Please mark the pain in the lumbosacral pain scale (0 - means no pain, 5 strong pain that prevents proper functioning).

7. How often do you take painkillers for the lumbosacral pain?

- I do not take any

- Sporadically

- once a day

- twice a day

- more often

8. How would you describe your mobility level?

- mobile

- partially mobile

- disabled to a mild degree

- disabled to moderate degree

- disabled to a significant degree

9. Please, evaluate the effectiveness of your treatment

- Your therapy has not produced any effects

- Your pain has decreased slightly

- There has been a significant reduction in pain

- The pain has gone completely

- Your pain has increased

10. Having had a series of treatments, would you decide for a further rehabilitation, should you need it?

- Definitely yes

- Yes

- I do not know

- Probably not

- Definitely not

The study

Patients diagnosed with lumbosacral discogenic pain syndrome were asked to complete the first part of the survey. Then, for the next days, they were subjected to rehabilitation using one of the methods assessed in this work. Work with the patient was carried out in consultation with physiotherapists employed by the given hospital, in order to exclude the possibility of overlapping and allow for reliable research. After a series of 10 treatments performed with a

specific method, patients were given the second part of the questionnaire, in which they assessed the effectiveness of the therapy.

RESULTS - ANALYSIS AND INTERPRETATION

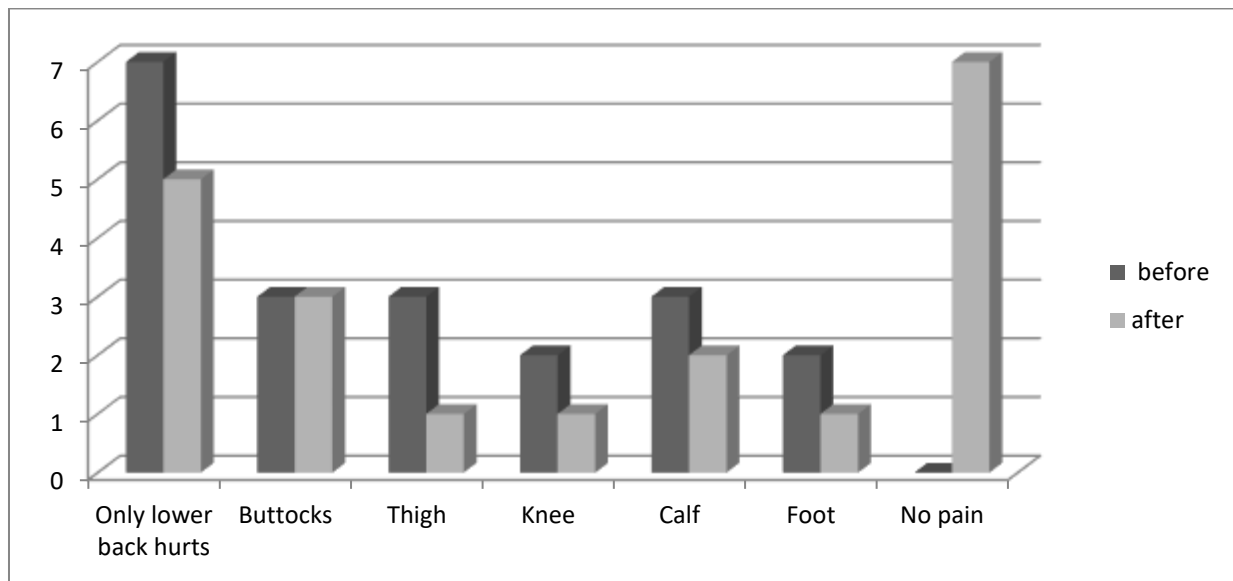
Based on the analysis of the results it can be stated that before the procedures, patients, regardless of the type of rehabilitation they were subjected to, experienced additional pain in the buttock, thigh and calf. Patients afflicted with lumbosacral discogenic pain syndrome most often declared, both before and after rehabilitation procedures, that they do not feel pain in other parts of the body. It should be noted that respondents were asked to indicate one answer, where the pain is dominant. Based on the results of the tests presented in Table 1, it can be concluded that after a series of treatments a significant difference in responses was noted only in the case of manual therapy. Of 8 people who declared that they feel pain only in the lower part of the spine before rehabilitation, this number fell to 2 people after a series of treatments. The number of patients who felt pain in other parts of the body also decreased. The number of patients suffering from knee pain due to PNF therapy (from 2 to 1 person) dropped by half, while the pain persisted in a patient subjected to manual therapy and physical procedures. This therapy showed the greatest effectiveness in the treatment of additional pain in the buttocks and thighs.

Table 1. Body parts additionally affected by pain.

	Body part additionally affected by pain					
	PNF		Manual therapy		Physiotherapeutic treatment	
	before	after	before	after	before	after
Only lower back hurts	7	5	8	2	6	5
Buttocks	3	3	4	2	4	2
Thigh	3	1	4	2	3	3
Knee	2	1	1	1	2	2
Calf	3	2	3	2	4	2
Foot	2	1	0	0	1	1
No pain	0	7	0	11	0	5

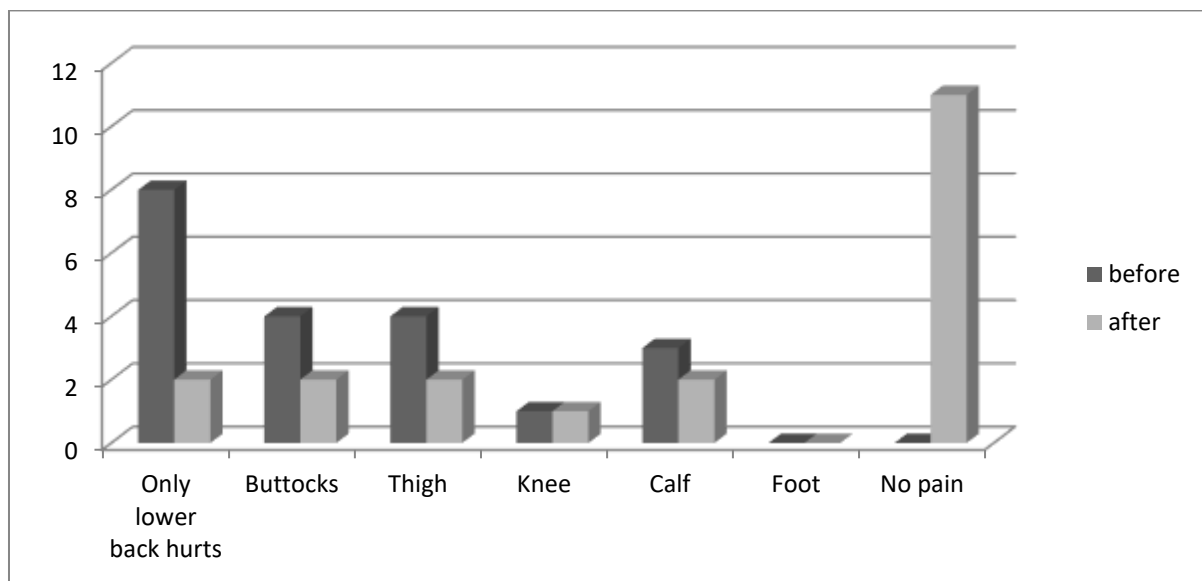
Source: my own study.

Figure 3. Area of the body, which was additionally affected by pain in patients treated with the PNF method.



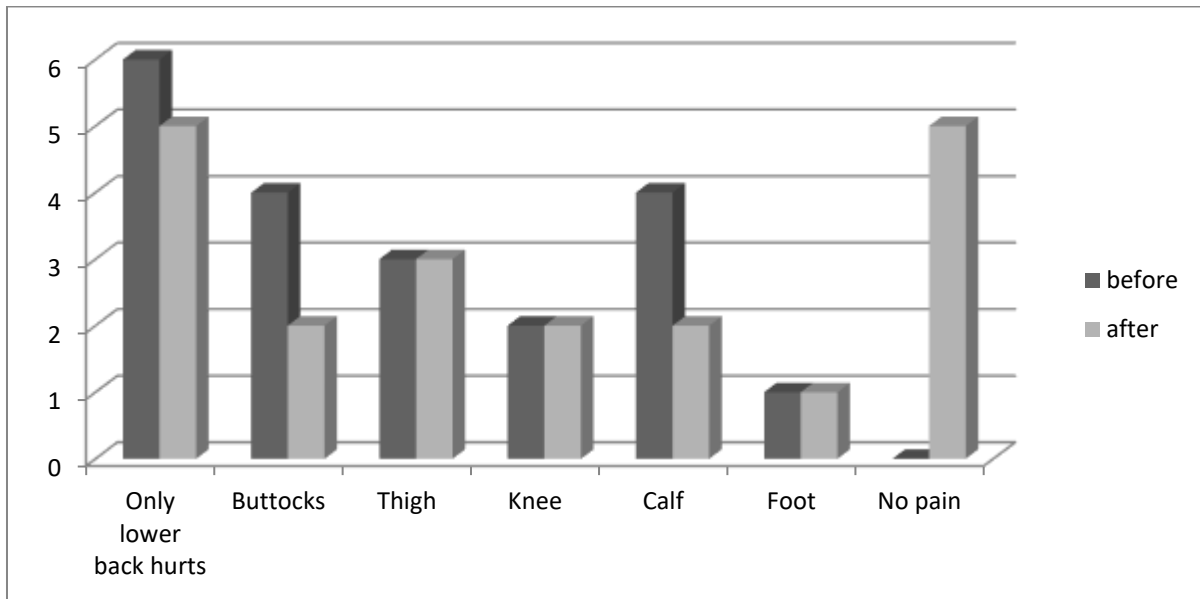
Source: own study.

Figure 4. Area of the body, which was additionally affected by pain in patients treated with manual therapy.



Source: own study.

Figure 5. Area of the body, which was additionally affected by pain in patients treated with physiotherapeutic treatments.



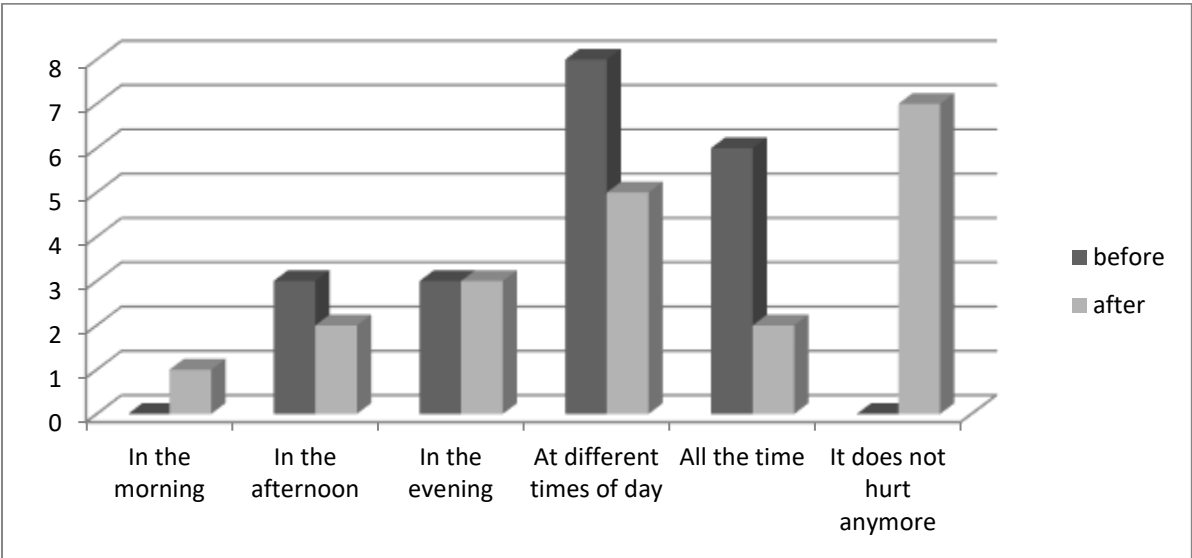
Source: own study.

Table 2 presents the frequency of pain occurrence at a particular time of the day. Before the rehabilitation procedures, the answer "at different times of day" was given by the largest number of respondents. This was confirmed by 8 patients treated with PNF, 11 undergoing manual therapy and 9 with physiotherapeutic treatments. After the rehabilitation, this situation changed significantly only in the case of manual therapy, where only 3 people gave this answer. The most important changes can be noted when analyzing the number of responses "It does not hurt anymore". After the rehabilitation with the use of manual therapy this option was chosen by as many as 11 people, which is 55% of the respondents in this group, in the PNF method it was 7 people (35%), and in the physiotherapeutic treatment 5 people (25%). The distribution of responses in individual groups for the three types of therapy is shown in Charts 6, 7 and 8.

Table 2. The time of the day when the pain usually occurred.

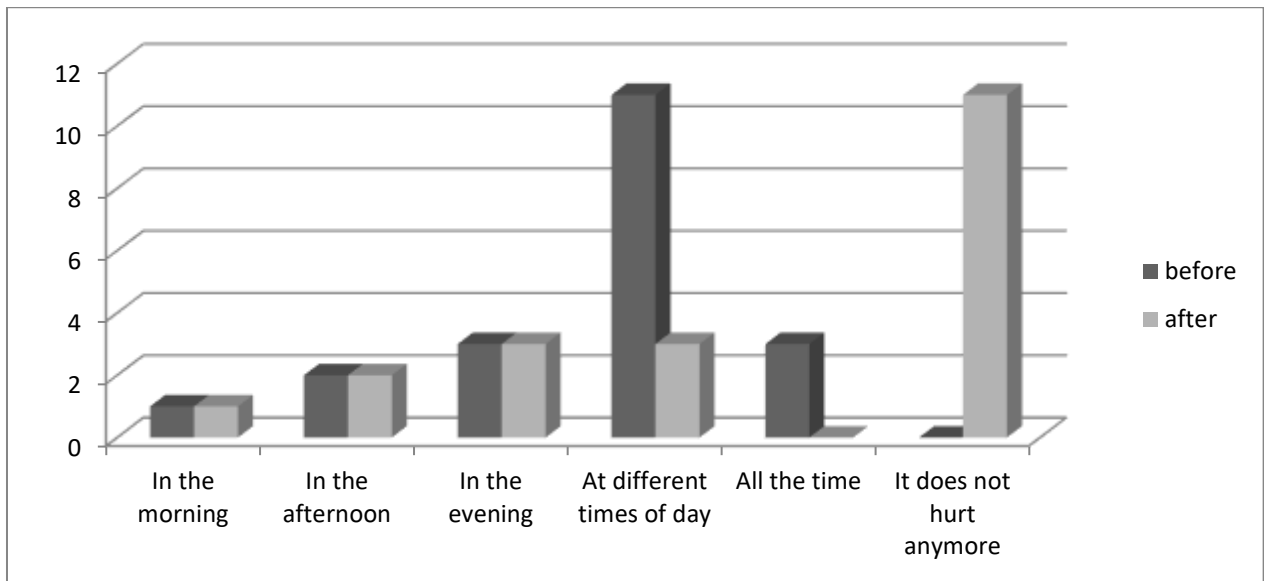
	Time of pain occurrence					
	PNF		manual therapy		physiotherapeutic treatment	
	before	after	before	after	before	after
In the morning	0	1	1	1	3	2
In the afternoon	3	2	2	2	2	2
In the evening	3	3	3	3	5	4
At different times of day	8	5	11	3	9	6
All the time	6	2	3	0	1	1
It does not hurt anymore	0	7	0	11	0	5

Figure 6. The time of the day when pain occurred in patients treated with the PNF method.



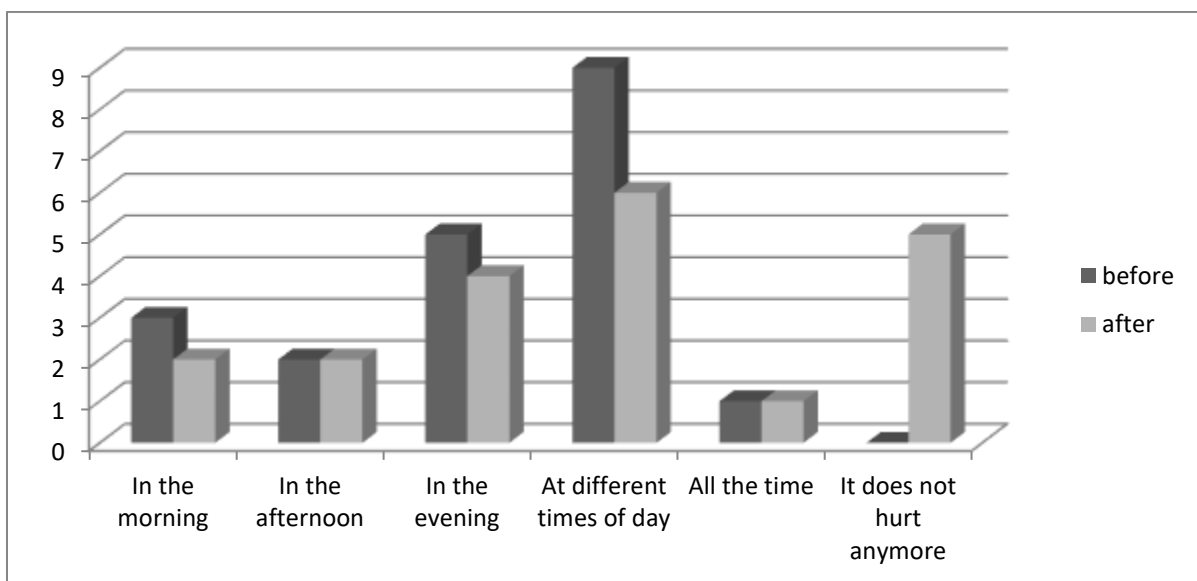
Source: own study.

Figure 7. Time of the day when pain occurred in patients treated with manual therapy.



Source: own study.

Figure 8. Time of the day when pain occurred in patients treated with physiotherapeutic treatments.



Source: own study.

Table 3 presents the answers of the respondents to the question about the position in which pain most often occurs. Analysis of the results shows that the position in which respondents most often experienced pain before rehabilitation was the sitting position. In total, it was indicated by 29 people, the second answer to the frequency of pain was the "when working" option, which was chosen by a total of 11 patients, while the answer "when lying" was given by only 3 people.

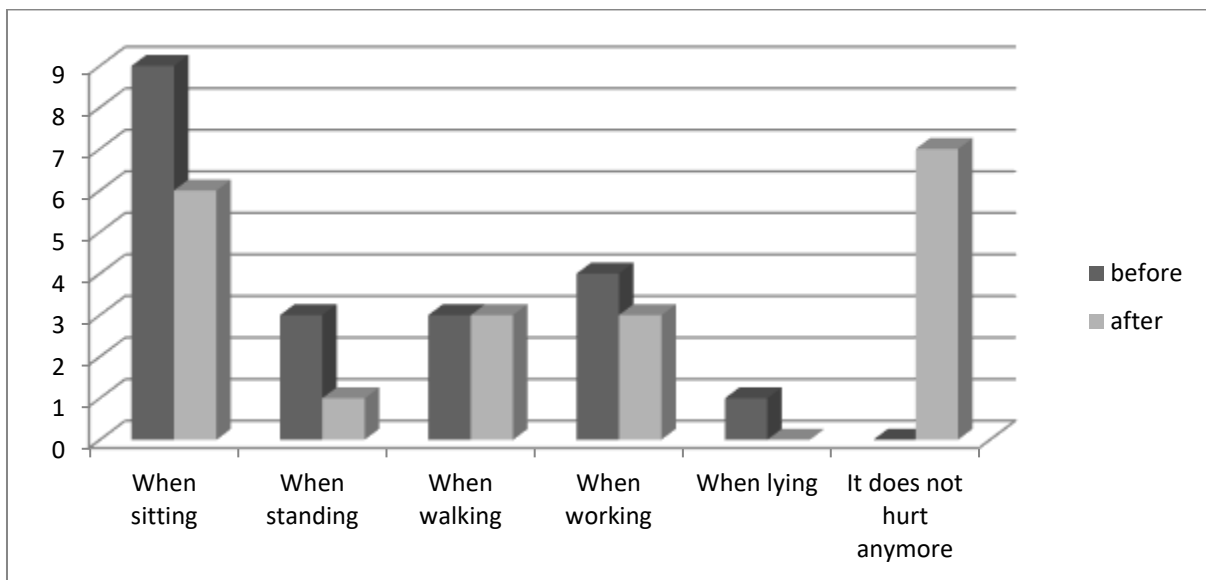
There were no significant changes in the distribution of responses after rehabilitation. Only in the case of manual therapy the number of respondents indicating the "when sitting" option decreased to 5. Figures 9, 10 and 11 show the distribution of responses in individual groups.

Table 3. The position in which pain is felt.

	The position in which pain is felt					
	PNF		manual therapy		physiotherapeutic treatments	
	before	after	before	after	before	after
When sitting	9	6	12	5	8	3
When standing	3	1	1	0	4	3
When walking	3	3	3	1	3	4
When working	4	3	4	3	3	5
When lying	1	0	0	0	2	0
It does not hurt anymore	0	7	0	11	0	5

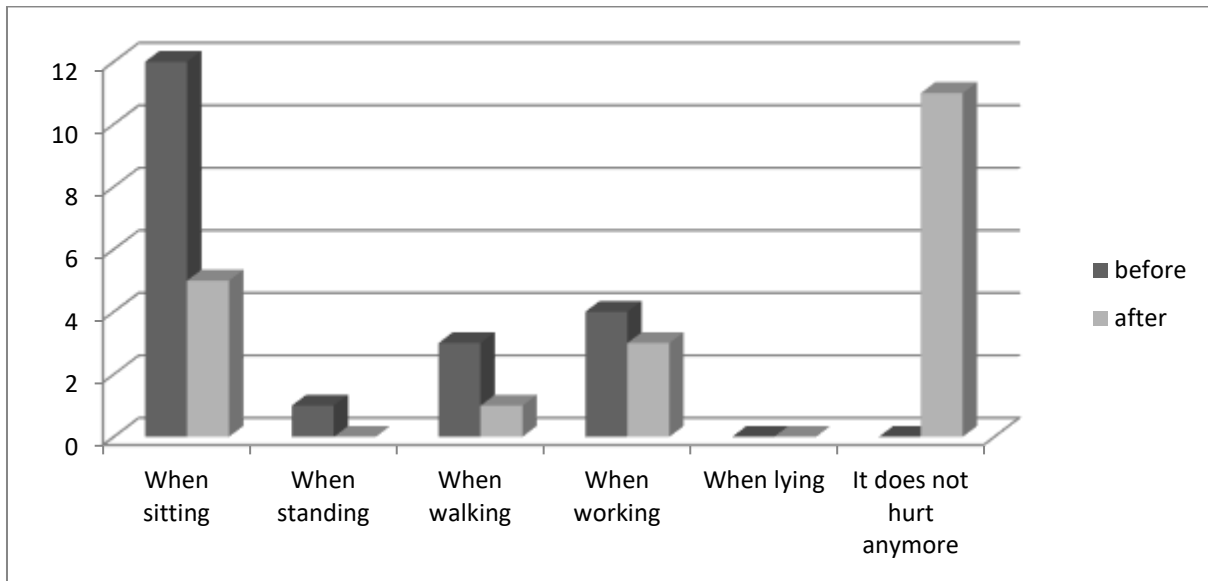
Source: my own study.

Figure 9. Position in which pain occurs in patients treated with the PNF method.



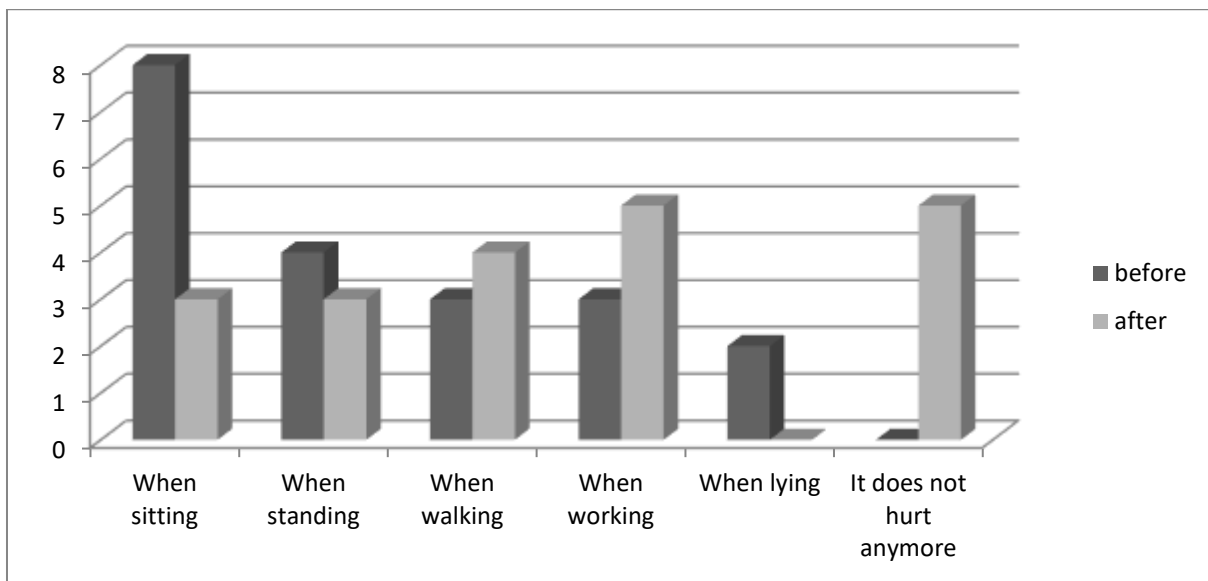
Source: own study.

Figure 10. Position in which pain occurs in patients treated with manual therapy. Source: own study.



Source: own study

Figure 11. Position in which pain occurs in patients treated with physiotherapeutic procedures.



Source: own study

The type of pain predominating in the studied patients is presented in Table 4. The most frequently indicated types of pain experienced before rehabilitation in the respondents were the lancinating pain (29 indications), blunt pain (11 indications) and stinging (10 indications). The most frequent answer after the treatments was "It does not hurt anymore" - 23 people, while for the remaining patients the lancinating pain was still predominant (13 people). Both before and

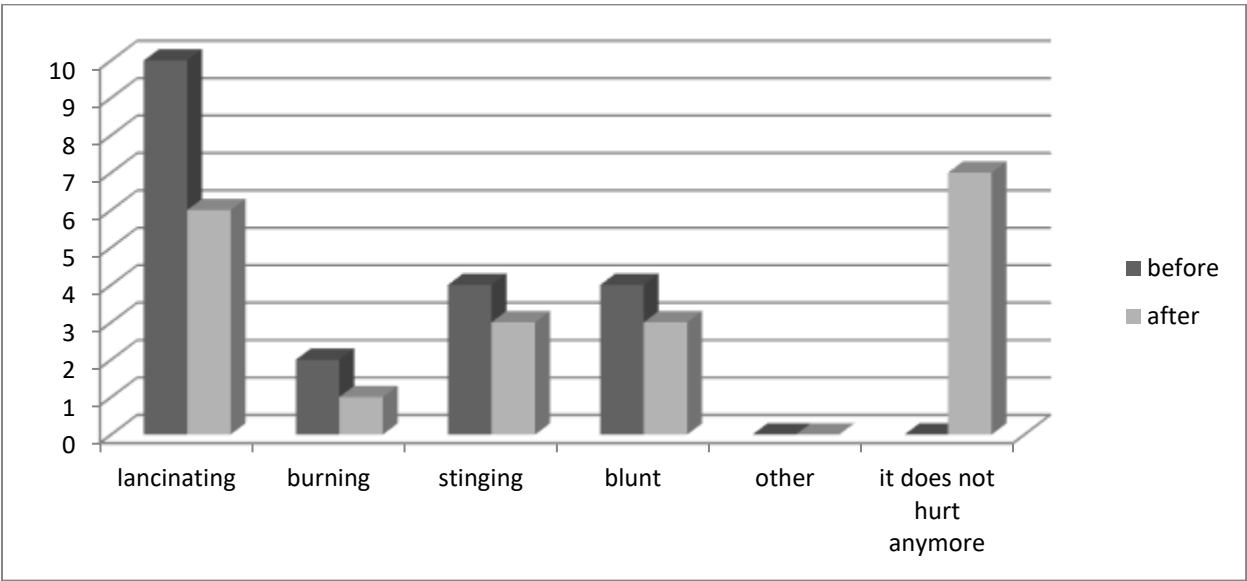
after rehabilitation, patients were least likely to experience pain that they could not describe, in the survey marked as "other". The lowest percentage of people whose pain disappeared or diminished was noted in the case of people undergoing physiotherapeutic treatment, especially when it comes to lancinating pain. The graphs 12, 13 and 14 below show the type of pain in patients undergoing the chosen therapy.

Table 4: The type of pain experienced by the patients.

	Type of pain					
	PNF		manual therapy		physiotherapeutic treatments	
	before	after	before	after	before	after
lancinating	10	6	11	2	8	7
burning	2	1	3	2	4	2
stinging	4	3	2	3	4	3
blunt	4	3	3	2	4	3
other	0	0	1	0	0	0
it does not hurt anymore	0	7	0	11	0	5

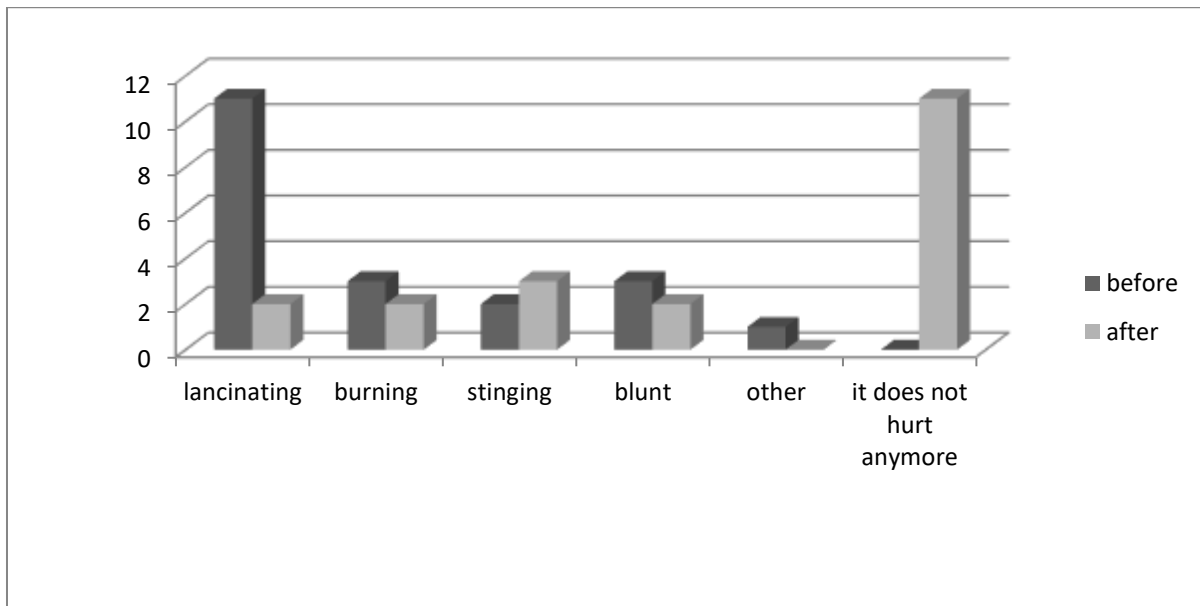
Source: own study

Figure 12. Type of pain in patients treated with the PNF method.



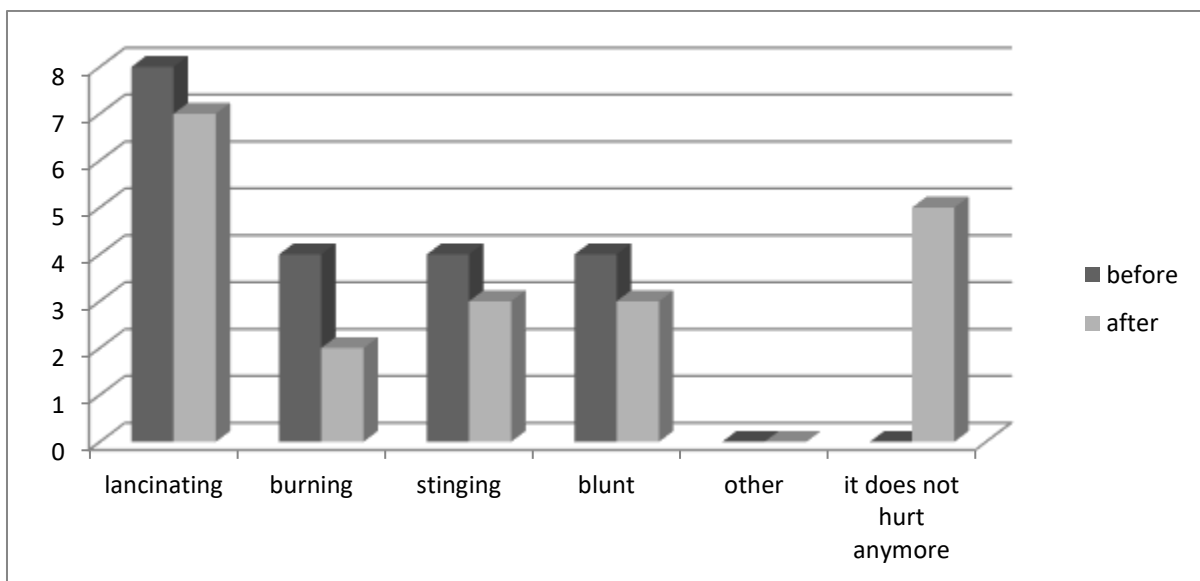
Source: own study.

Figure 13. Type of pain in patients treated with manual therapy.



Source: own study.

Figure 14. Type of pain in patients treated with physiotherapeutic procedures.



Source: own study

One of the questions in the survey concerned additional symptoms (other than pain) that caused the greatest discomfort. The majority of patients indicated that, in addition to pain, they felt numbness (18 people) and muscle weakness (17 people), and the symptom which was the least frequent was the sensory disorder, which was observed by 7 people. Only 4 people declared that they do not have other symptoms, except for pain. Muscle weakness and numbness were the most frequent symptoms in patients after rehabilitation. The research shows that there are

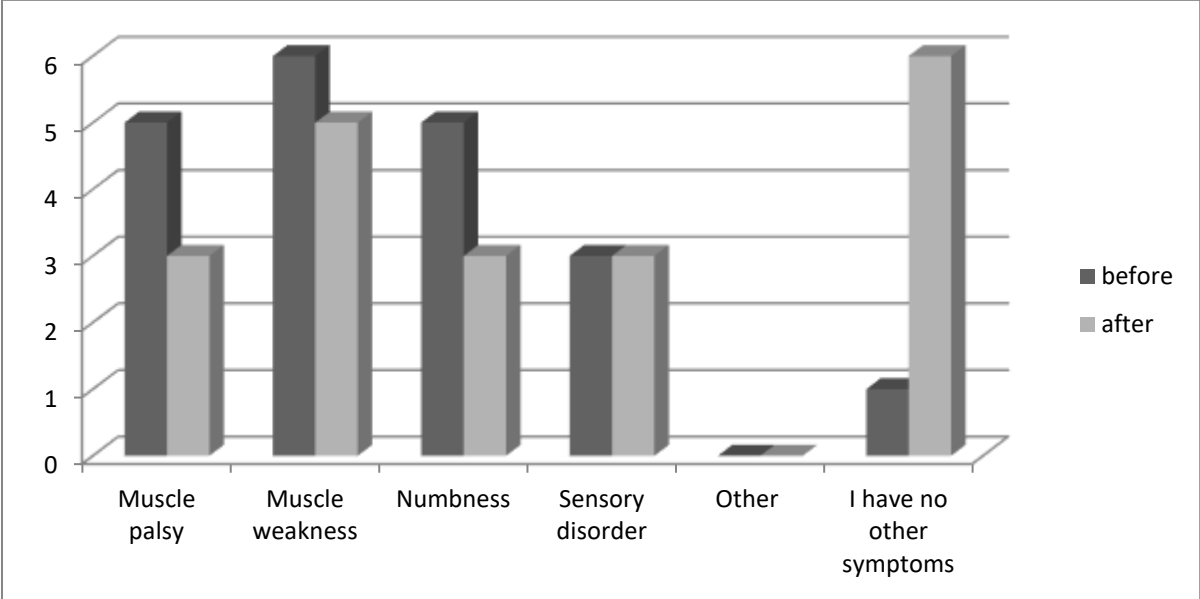
no significant differences as for the elimination of the symptoms discussed, depending on the therapy applied. All methods of rehabilitation proved to be effective to some extent, although none of them eliminated additional symptoms in all patients. The manual therapy, which is the most effective in the treatment of numbness, turns out to be the best. In addition, after the therapy using this method 9 people stated that they did not experience the symptoms anymore. The results are presented in the following table and in the figures 15, 16, 17.

Table 5. Additional symptoms that cause the most discomfort

	Additional symptoms					
	PNF		Manual therapy		Physiotherapeutic treatment	
	before	after	before	after	before	after
Muscle palsy	5	3	3	1	6	4
Muscle weakness	6	5	7	5	4	3
Numbness	5	3	8	3	5	6
Sensory disorder	3	3	1	1	3	2
Other	0	0	0	1	0	0
I have no other symptoms	1	6	1	9	2	5

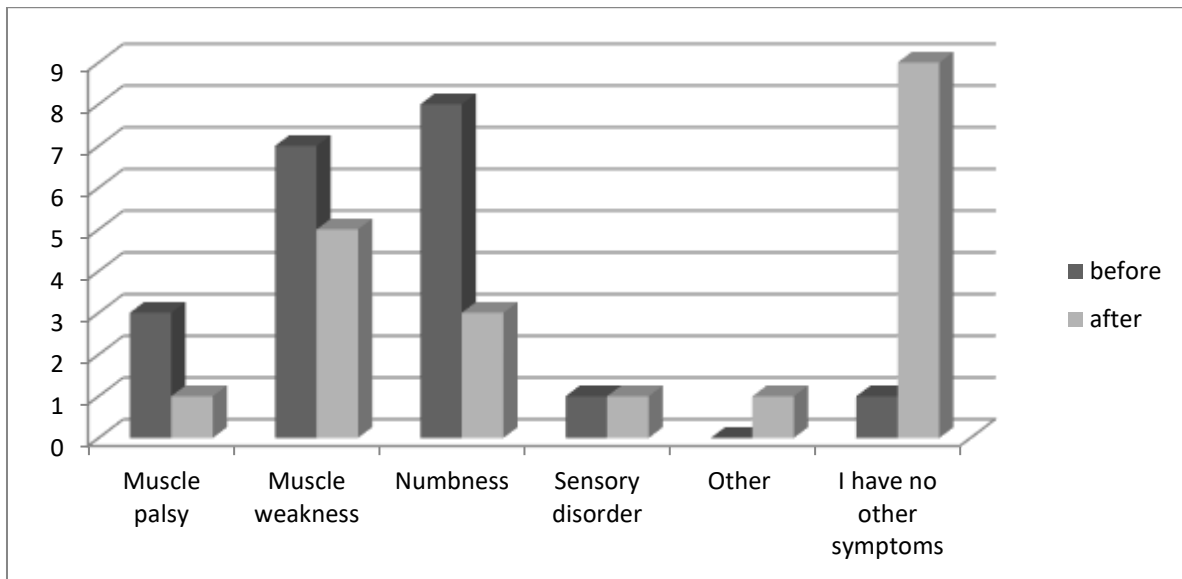
Source: my own study

Figure 15. Presence of additional symptoms in patients treated with the PNF method.



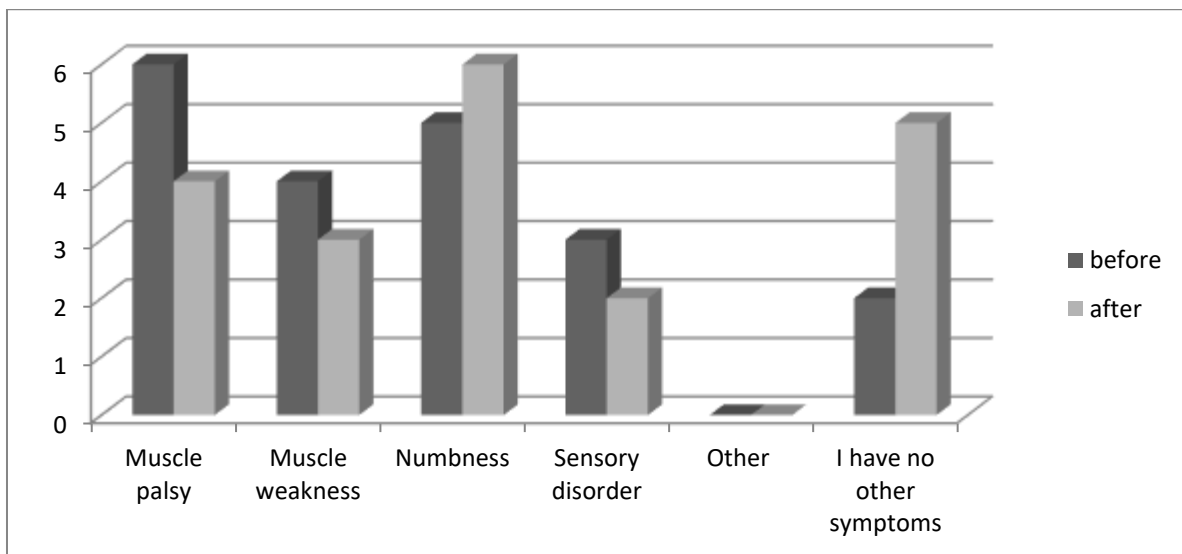
Source: own study.

Figure 16. Presence of additional symptoms in patients treated with manual therapy.



Source: own study.

Figure 17. Presence of additional symptoms in patients treated with physiotherapeutic treatment.



Source: own study

Analyzing Table 6 and Figures 18, 19 and 20, it can be stated that before the therapy most respondents, that is 18 people, declared that the level of pain perceived by them is 5 to 6 ("it hurts much more"). 13 people experience pain at level 4, and 12 at level 3 and 2 ("it hurts a little more" and "hurts a little"). 8% declared that they feel pain that is unimaginable. After the rehabilitation, there was an improvement, because the total of most respondents (15 persons) chose the answer "hurts a little more", i.e. pain at level 3. The most significant difference can

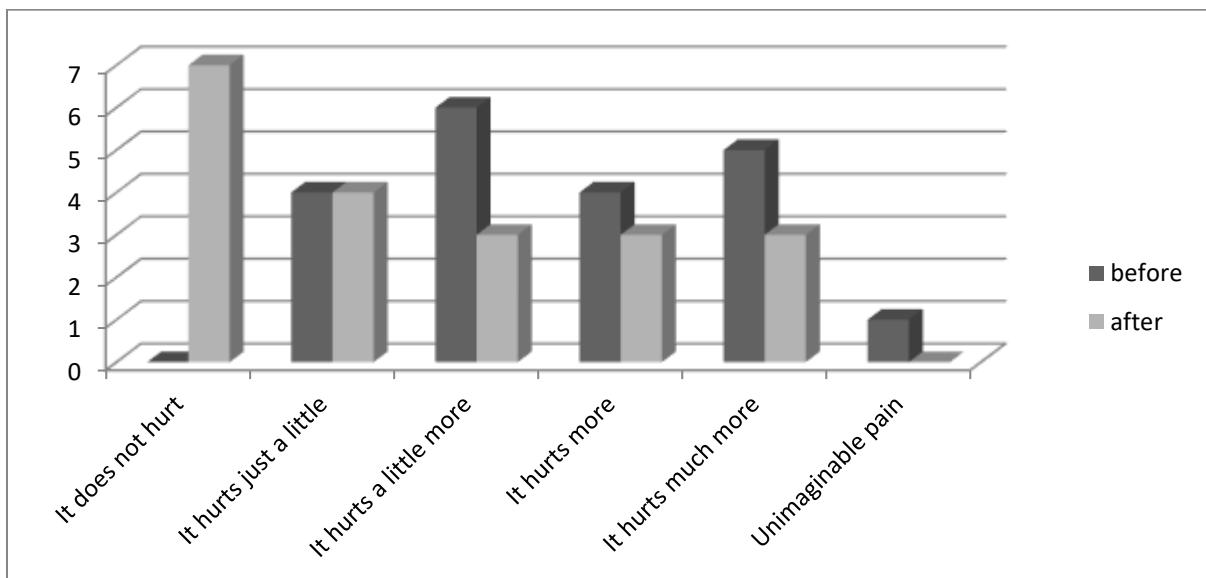
be seen in manual therapy, where after a series of treatments there were 11 people who chose the answer " it does not hurt". The number of patients declaring that the level was 4 or 5 also decreased to zero. Good results were also achieved by the PNF method, which also reduced the number of people experiencing severe pain. However, after physiotherapeutic procedures, several people felt that their pain level increased.

Table 6. Pain intensity scale

	Pain intensity					
	PNF		Manual therapy		Physiotherapeutic treatment	
	before	after	before	after	before	after
It does not hurt	0	7	0	11	0	5
It hurts just a little	4	4	3	4	5	1
It hurts a little more	6	3	5	5	1	7
It hurts more	4	3	5	0	4	2
It hurts much more	5	3	6	0	7	4
Unimaginable pain	1	0	1	0	3	1

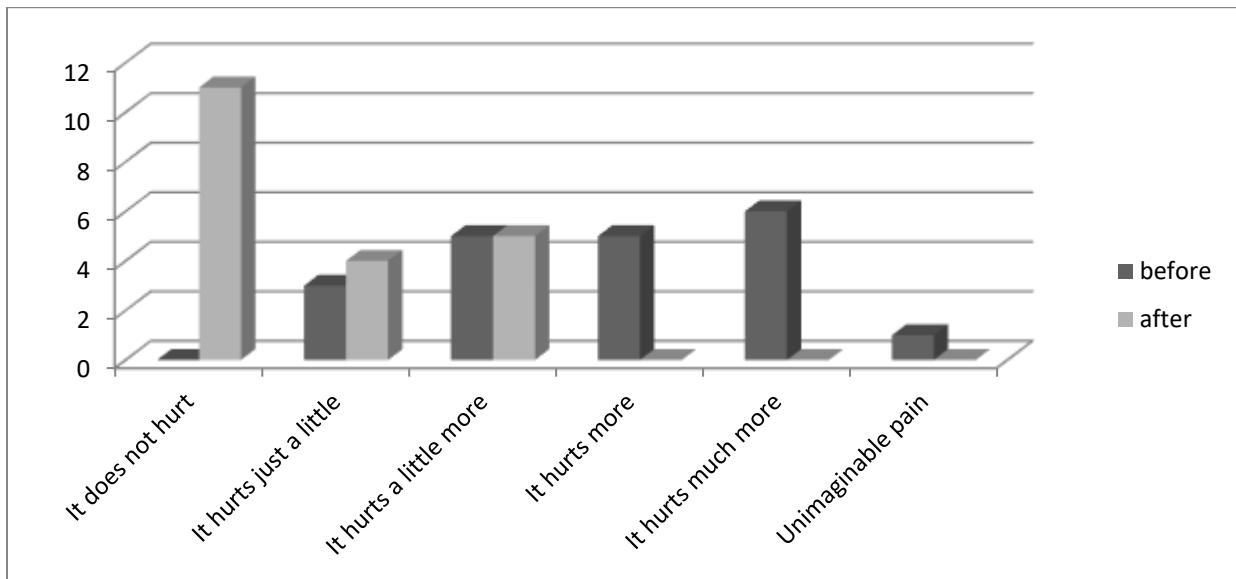
Source: own study.

Figure 18. Intensity of pain in patients treated with the PNF method.



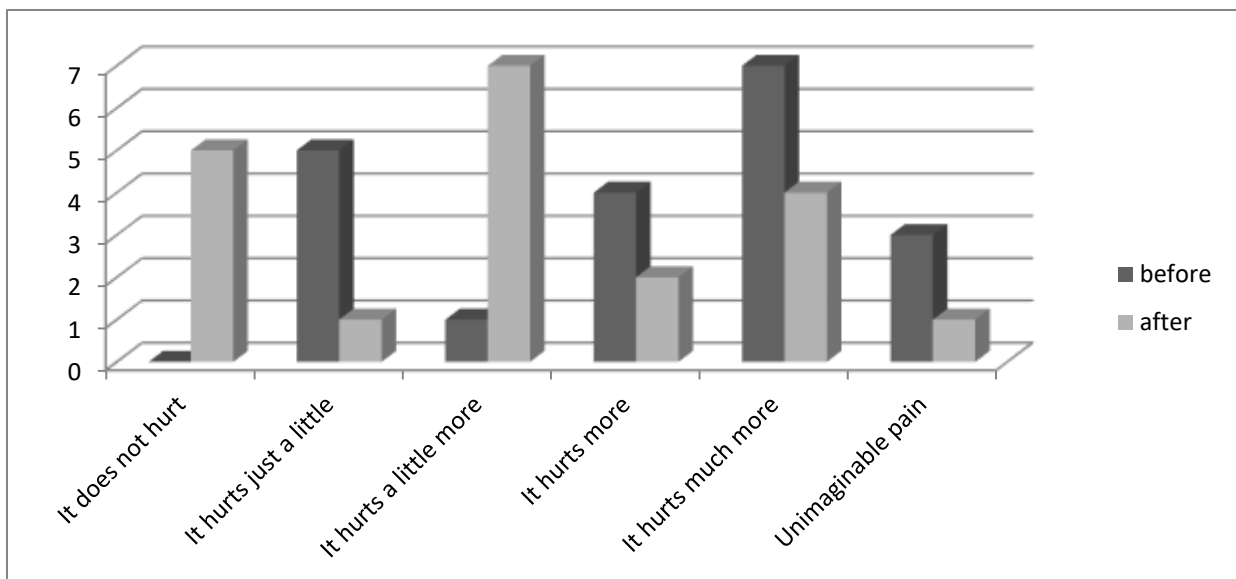
Source: own study.

Figure 19. Pain intensity in patients treated with manual therapy.



Source: own study.

Figure 20. Pain intensity in patients treated with physiotherapeutic procedures.



Source: own study

Table 7 deals with the frequency of taking painkillers related to back pain. Before starting the rehabilitation, patients most often declared that they take drugs sporadically (10 people in the PNF method, 11 people in manual therapy and 13 people in therapeutic procedures). After completing the rehabilitation, the majority of respondents who were subject to manual therapy (12 people) and PNF method (9 people) stopped taking drugs. In patients treated with physiotherapeutic treatments the number of people taking drugs once a day increased from 1 to

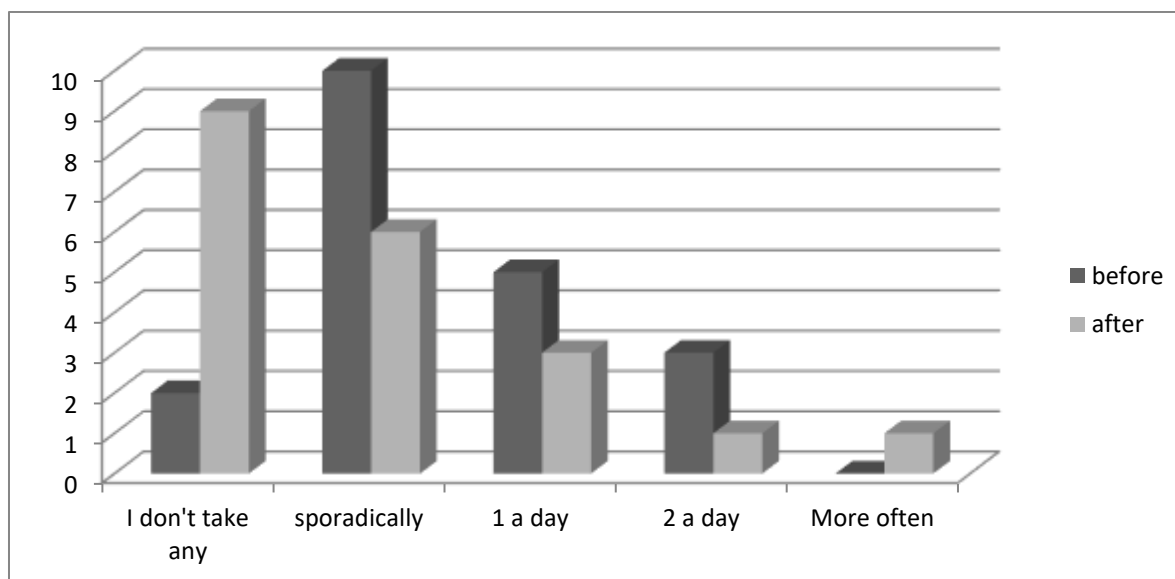
8., and one respondent stated that after the treatment he took the medication more than twice a day. These results are illustrated in Figures 21, 22 and 23.

Table 7. Frequency of taking painkillers.

	Frequency of taking painkillers.					
	PNF		manual therapy		physiotherapeutic treatments	
	przed	po	przed	po	przed	po
I don't take any	2	9	1	12	1	4
sporadically	10	6	11	4	13	8
1 a day	5	3	5	4	1	7
2 a day	3	1	2	0	5	0
More often	0	1	1	0	0	1

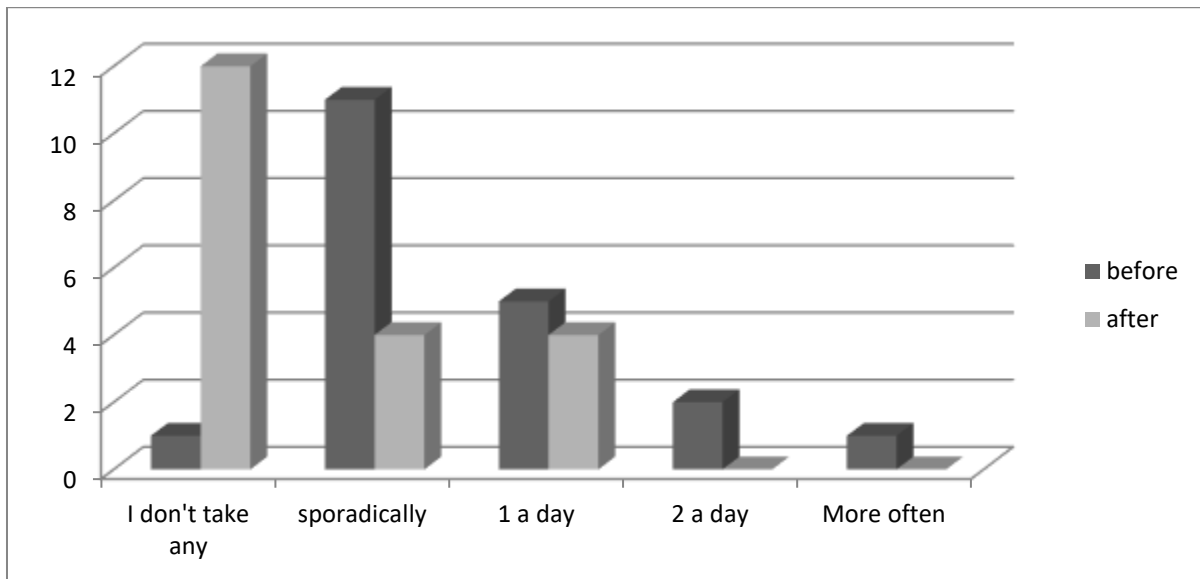
Source : Own study.

Fig. 21. Frequency of taking painkillers in patients treated with the PNF method.



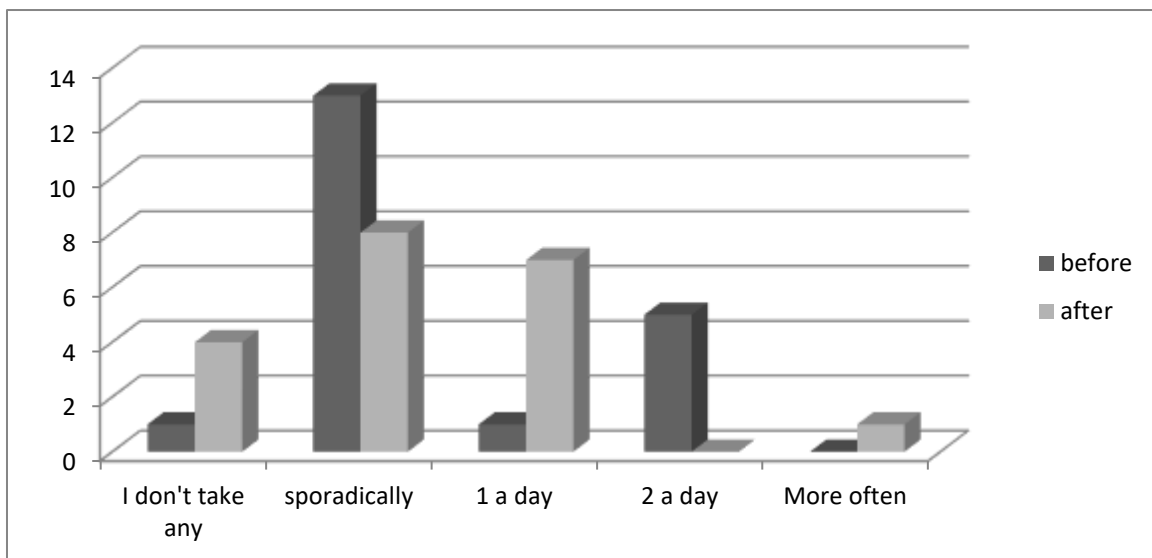
Source: own study.

Fig. 22. Frequency of taking painkillers in patients treated with manual therapy.



Source: own study.

Figure 23. Frequency of taking painkillers in patients treated with physiotherapeutic treatments.



Source: own study.

Answers to the questions about general mobility assessment are presented in Table 8. Analyzing the results of the research, it can be noticed that after the rehabilitation procedures, the overall mobility declared by the patients improved. Before rehabilitation, 40 patients claimed that they were partially mobile. After the end of the series of treatments, the number of respondents declaring full mobility increased (from 13 to 32 people), and the remaining rates decreased. After the rehabilitation none of the respondents perceived themselves to be significantly or moderately disabled, although before the treatments the percentage of such persons was very

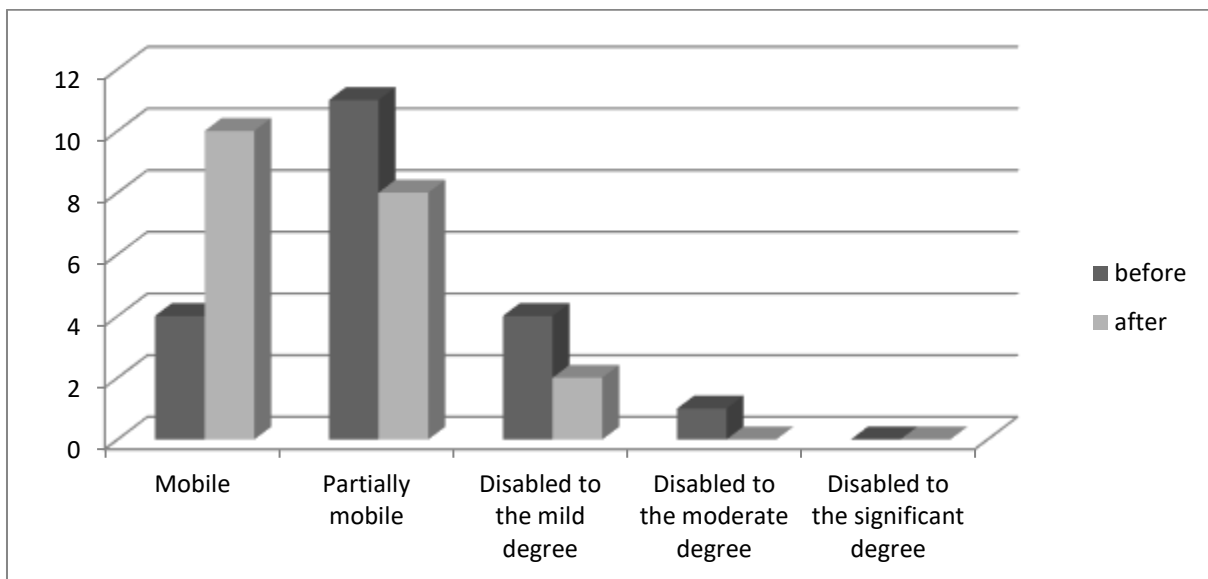
small, that is only 5%. The greatest improvement can be seen in the case of manual therapy, where 14 people marked the answer "mobile", although there were only 4 such answers before the treatment. The distribution of responses in individual groups is shown in Figures 24, 25 and 26.

Table 8. The degree of mobility declared by the patient.

	The degree of mobility declared by the patient.					
	PNF		Manual therapy		Physiotherapeutic treatment	
	before	after	before	after	before	after
Mobile	4	10	4	14	5	8
Partially mobile	11	8	15	6	14	11
Disabled to the mild degree	4	2	0	0	0	1
Disabled to the moderate degree	1	0	1	0	1	0
Disabled to the significant degree	0	0	0	0	0	0

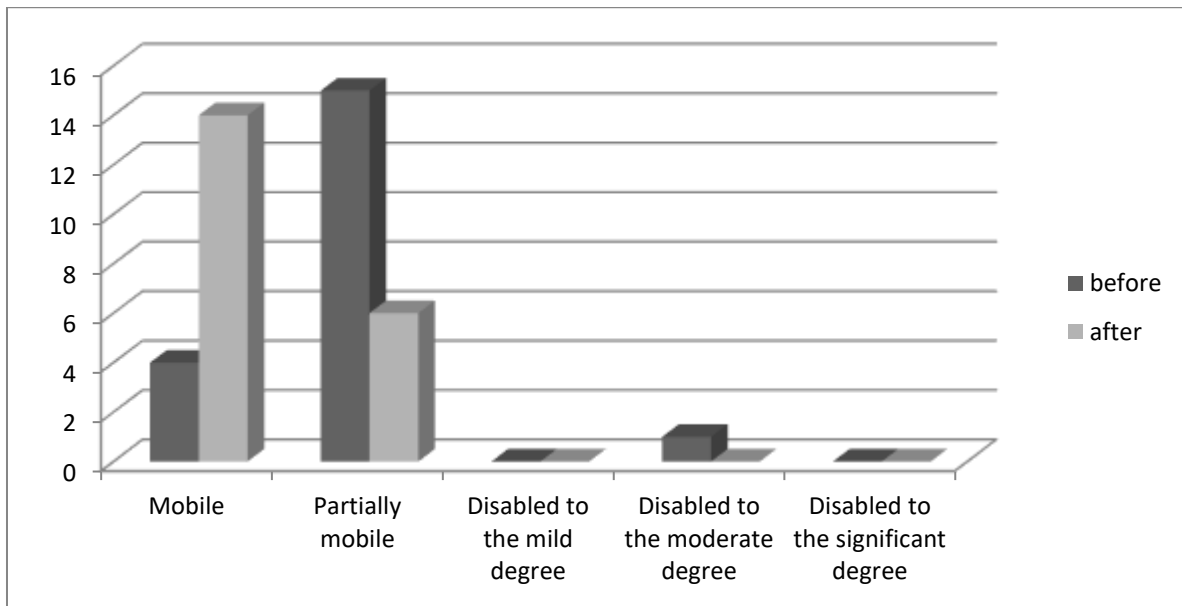
Source: own studies

Figure 24. Degree of mobility in patients treated with the PNF method.



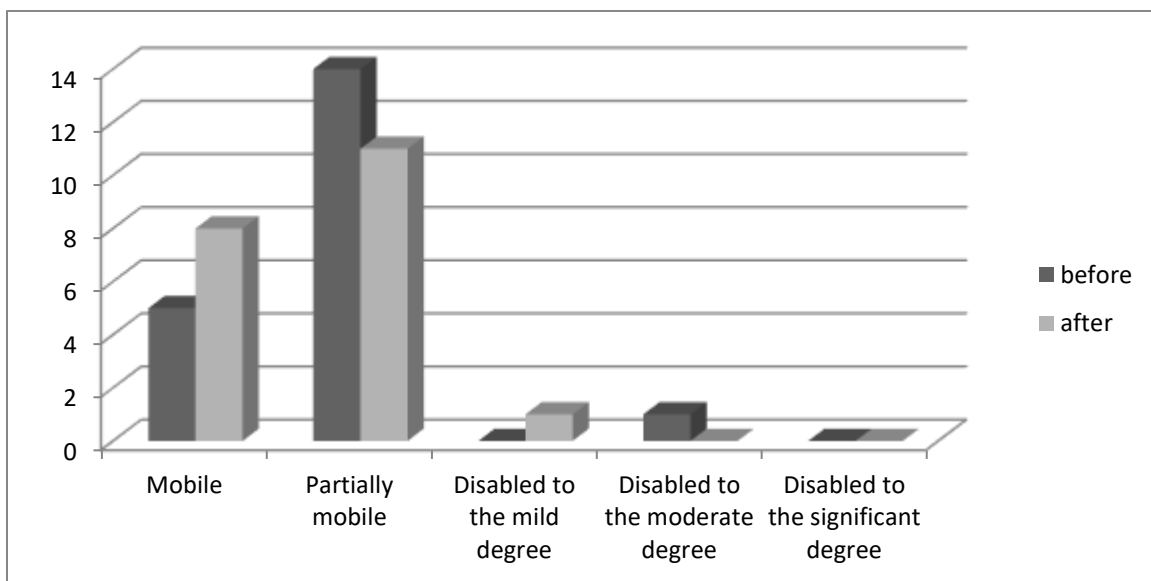
Source: own study.

Figure 25. The degree of mobility in patients treated with manual therapy.



Source: own study.

Figure 26. The degree of efficiency in patients treated with physiotherapeutic procedures.



Source: own study.

Table 9 and Figure 27 summarize the assessment of the effectiveness of individual methods made by patients. The manual therapy was by far the most effective method of therapy. 12 of the respondents stated that the pain was reduced and in 5 people the pain subsided completely. All those rehabilitated with manual therapy noticed its positive effects, which cannot be said by other methods. The PNF method has also been highly rated - 8 patients treated with it declared that the pain decreased slightly, in 8 the pain decreased significantly, and in the case

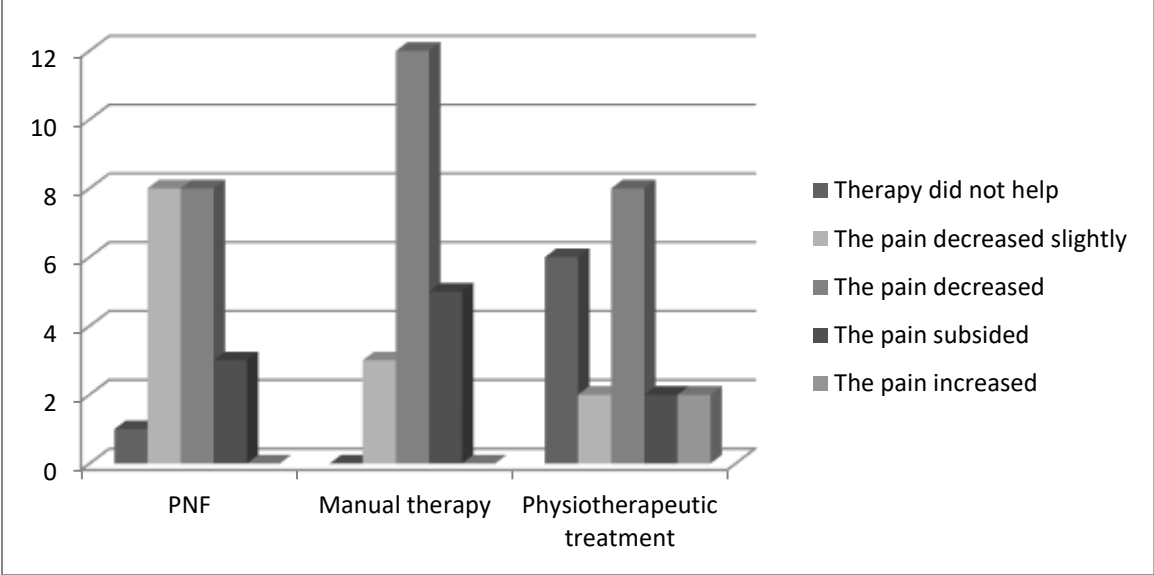
of 3 people the pain subsided completely. The worst results are presented by the physiotherapy treatments, 6 patients found that the therapy did not help, and 2 people even acknowledged that the pain symptoms increased.

Table 9: Evaluation of the effectiveness of the therapy.

	Evaluation of the effectiveness of the therapy.		
	PNF	Manual therapy	Physiotherapeutic treatment
Therapy did not help	1	0	6
The pain decreased slightly	8	3	2
The pain decreased	8	12	8
The pain subsided	3	5	2
The pain increased	0	0	2

Source: own study

Figure 27. Evaluation of the effectiveness of therapy.



Source: own study

Having questioned the patients about their willingness to re-enter therapy and based on the analysis of the results, illustrated in Table 10 and Figure 28, it can be concluded that manual therapy is the best treatment - 80% of people subjected to this type of procedures declared that

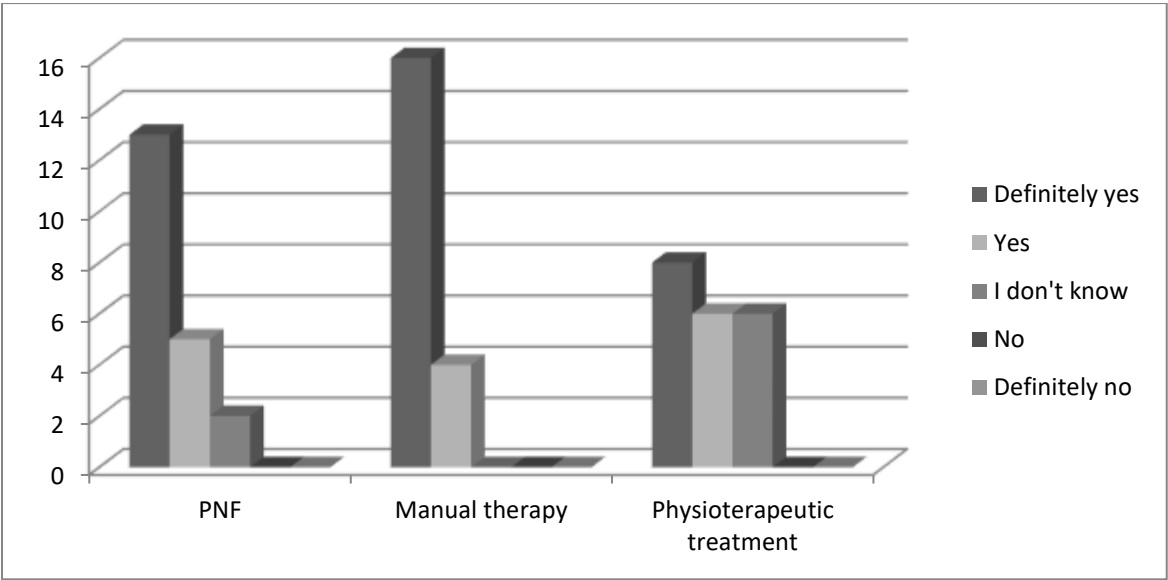
they are definitely ready for another treatment if needed, and the remaining 20% that they would consider it. Also in the case of PNF and physiotherapeutic procedures, most people would undergo it again or would consider being rehabilitated again. Only 2 people in PNF therapy and 6 in physical procedures had doubts whether they would like to be rehabilitated this way once again and chose the answer "I do not know".

Table 10. Willingness to undergo the therapy again.

	Willingness to undergo the therapy again.		
	PNF	Manual therapy	Physiotherapeutic treatment
Definitely yes	13	16	8
Yes	5	4	6
I don't know	2	0	6
No	0	0	0
Definitely no	0	0	0

Source: my own study

Figure 28. Willingness to undergo the therapy again.



Source: own study

Discussion:

In recent years, the number of people with lumbosacral spine pain syndrome has increased, which is linked to a change in the way of life of a modern man. J. Kiwerski points out that obesity, cigarette smoking, stress and low physical activity cause disorders in the hormonal and immune system [5]. In addition, as the researchers point out that after millions of years of upright position adaptation, now over the last several decades man is trying to adapt to a sitting position [5,6]. Lisiński states that there are no unambiguous answers to the question what kind of work (physical, mental) particularly predisposes the occurrence of lumbar pains. Spine structure strains can be a result of both forms of occupational activity, those requiring high physical exertion, as well as those defined as "sedentary" or "mental" [9]. The results of the study confirm the data available in the literature, regarding the age at which lumbar spine pain most often occurs. As E. Domka writes, these problems mostly concern people in the second and third decade of life. [2] This is usually the time of the most intense work in human life, hence the greater predisposition to this type of ailments. The pain is most often caused by an abnormal strain when the body is tilted forward (eg when lifting a heavy weight). Patients should pay particular attention to the even distribution of weight. It is also important that they take a neutral position, relieving the discs, as well as avoiding excessive bending, bending, straightening or twisting of the upper body [8]. If left untreated or treated improperly, lumbosacral pain may become chronic. The results show that 36% of all respondents have experienced pain for more than a year. Therefore, researchers emphasize the great role of secondary prevention, whose task is to prevent the recurrence of the disease and the occurrence of pain symptoms and if they appear, eliminating them as soon as possible. [8] Most patients are treated conservatively, which allows them to return to physical fitness. Comprehensive treatment includes physiotherapeutic and pharmacological treatments, and is aimed mainly at painkilling, anti-inflammatory, anti-swelling and relieving effects. In the lumbosacral pain syndromes, there is no one method of treatment. Physiotherapists specializing in the PNF method will indicate its effectiveness in working with patients with such problems [1.10], while manual therapists will certainly choose this method of pain treatment [3,4]. The method of treatment depends on the patient's condition, individual needs and capabilities, time of illness and on the skills and commitment of the physiotherapist. The most commonly used methods of conservative treatment include physiotherapeutic procedures, manual therapy and PNF therapy. Subjective assessments of patients' therapy and clinical experience of the authors show the greatest effectiveness of manual therapy, which focuses primarily on the removal of pain by reducing

muscle tension, stretching of contracted muscles, strengthening of weakened muscles and restoring intervertebral joints.

COCLUSION

Based on the analysis of the tests and the results obtained from the questions it can be stated that:

1. Patients before and after the treatments, regardless of the type of rehabilitation to which they were subject, declared that the pain occurred most commonly in the buttock, thigh and calf.
2. The most frequent additional symptom in the examined patients before rehabilitation were numbness and muscle weakness, after rehabilitation it was muscle weakness.
3. The best results from the analyzed therapies were achieved by manual therapy. The second efficacy was PNF therapy, while the worst results were achieved by physiotherapy treatments.
4. Patients declared that the most effective method of therapy was manual therapy. In the second place was the PNF method and on the third place - physiotherapeutic procedures.
5. It can be stated that after the rehabilitation the number of painkillers taken by the respondents decreased. Only in the case of patients treated with the physiotherapeutic treatments the number of people taking medication increased.

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