

The impact of rehabilitation and preventive programmes on the quality of life and pain threshold of patients suffering from lower spinal cord pain

(Wpływ rehabilitacji i programów profilaktycznych na jakość życia i próg odczuwalności bólu u pacjentów z dolegliwościami bólowymi dolnego odcinka kręgosłupa)

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Abstract - Introduction: The fact that many people are not familiar with the rules of effort and work ergonomics as guidelines to their everyday activities is alarming. As a result, pain in the lumbar spine is a common ailment. This paper presents the method of preventing from that kind of affliction and an attempt to lower the pain threshold as well as the impact of educational programmes on the improvements in the quality of life of patients who suffer pain in the back.

Methods:

The study was conducted in the group of 160 patients of the Motor Organ Rehabilitation Centre (Ośrodek Rehabilitacji Narządu Ruchu) in Krzeszowice treated for pain in lumbar spine. The patients were divided into two 80-strong groups and subjected to selected kinds of physiotherapy treatment. What is more, one of the groups participated in an educational prevention programme on "healthy back". The following tools were employed in the study: the SF-36; a modification of the Laitinen Pain Indicator Questionnaire; a survey of a patient's subjective opinion on therapy and a functional test of selected activities and range of motion.

Results and conclusions:

1. Physiotherapy is effective in treating pain in the back.
2. Extending standard rehabilitation by educating patients on their condition significantly reduces their pain as compared to those patients whose treatment is restricted to physiotherapy only.
3. Making patients aware of the causes and types of their ailments through educational preventive programmes constitutes a significant contribution to the improvement of the quality of life in cases of patients suffering from lumbar spine pain.

Key words - preventive programmes, quality of life, pain.

Streszczenie – Wstęp: Niepokojącym faktem jest powszechny brak znajomości zasad ergonomii wysiłku i pracy, czyli prawidłowych wzorców zachowań w życiu codziennym. Sytuacja ta jest przyczyną wielu dolegliwości bólowych, głównie w odcinku lędźwiowym kręgosłupa. W pracy przedstawiono metodę zapobiegania tym dolegliwościom oraz próbę zmniejszenia poziomu odczuwalności bólu; wpływ dolegliwości bólowych na poziom jakości życia oraz znacze-

nie programów edukacyjnych na poprawę jakości życia pacjentów z dolegliwościami bólowymi kręgosłupa.

Metody:

Badaniami objęto grupę 160 pacjentów leczonych w Ośrodku Rehabilitacji Narządu Ruchu w Krzeszowicach w związku dolegliwościami bólowymi odcinka lędźwiowego kręgosłupa. Pacjentów podzielono na dwie 80-osobowe grupy i poddano wybranym zabiegom fizjoterapeutycznym; dodatkowo jedna z grup uczestniczyła w edukacyjnym programie profilaktycznym dotyczącym „zdrowych pleców”. Do przeprowadzenia badań użyto następujących narzędzi badawczych: Kwestionariusz SF-36; zmodyfikowaną skalę bólu Laitinena; ankietę subiektywnych odczuć pacjenta po terapii oraz test funkcjonalny wybranych czynności i zakresu ruchów.

Wyniki i wnioski:

1. Fizjoterapia jest skuteczna w leczeniu dolegliwości bólowych kręgosłupa.
2. Wzbogacenie standardowej rehabilitacji o wybrane elementy edukacji pacjenta z zakresu jego choroby powoduje istotną redukcję bólu w porównaniu z pacjentami korzystającymi jedynie z wybranych zabiegów fizjoterapeutycznych.
3. Uświadomienie choremu przyczyn i rodzaju jego dysfunkcji poprzez edukację w formie programów profilaktycznych ma istotny wpływ na poprawę jakości życia chorych z zespołem bólowym odcinka lędźwiowego kręgosłupa.

Słowa kluczowe - programy profilaktyczne, jakość życia, dolegliwości bólowe.

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Authors' contributions to the article:

- A. The idea and the planning of the study
- B. Gathering and listing data
- C. The data analysis and interpretation
- D. Writing the article
- E. Critical review of the article
- F. Final approval of the article

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I. INTRODUCTION

People are often required to exercise their lifting abilities, e.g. while transporting things manually and physical activities involving lumbar spine, either at work or in their everyday lives. Even if such activities are engaged in only occasionally, a person's abilities may not be sufficient to perform a given task, as a consequence of which the motor system undergoes overload changes and pain related to them [1]. Unprepared muscle and ligament systems weakened by stress and chronic exhaustion are incapable of performing the tasks that exceed one's physiological abilities, posing a threat of microtraumas and pathological lesions in the spinal structures [2].

The considerable development in productive sector as well as various improvements in the general and household use of mechanical equipment allow the spine to be relieved and function properly. Nevertheless, the present situation does not make full elimination of spine-related pain possible. Around 75% to 80% of the population suffer from spinal pain syndromes within their lifespan [2,3]. In the professions that are especially exposed to that risk the percentage can be much higher, reaching about 90% [4].

The fact that many people are not familiar with the rules of effort and work ergonomics as guidelines to their everyday activities is alarming. Prevention is believed to be of utmost importance – obviously, it is easier to prevent problems from occurring than to treat them. The prevention of lumbar spine pain is based on educating people on the spinal biomechanics applied to their effort at work, at home and during their leisure and sports-related activities. Therefore, while younger generations need to be taught the right motor stereotypes, adults should be made to change their wrong habits established throughout the years [5].

Tackling this problem is the objective of the so-called Back School – a complex prevention and treatment programme whose main tasks include teaching on the processes related to spinal anatomy and biomechanics, analysing the consequences of the relevant disorders, helping people handle their pain (antalgic postures) and educating on the significance of physical activity as well as particular exercises (stretching, strengthening, relaxing and functional everyday motions – sitting, standing up, bending down, working).

The back school, as an interdisciplinary theoretical and practical programme, offers sets of particular exercises appropriated for a given profession (occupations requiring considerable physical effort and high motor activity; occupations causing static overloads resulting from working in a forced position; occupations requiring a sitting posture; pregnant women etc.).

The following elements are common for all the groups:

- Learning to assume proper body postures
- Training proper behaviour
- Functional gymnastics
- Relaxing and strengthening exercises

The research shows that the effects of therapy applied in cases of people suffering from chronic lumbar spine pain are much greater when patients are instructed on the nature of their affliction and their participation in the therapy is active. Responsibility for one's actions, eventually resulting in relief and improvement in the quality of life, is one of the best arguments motivating to observe the back school rules. Prevention and systematic effort to bear ergonomics in mind in one's everyday activities are successful at restoring more and more people into active lifestyle, as they tend to give up their sick leaves due to the lumbar spine pain reduction..

II. MATERIALS AND METHODS

The study involved a group of 160 patients divided into two 80-strong subgroups (the control and the experimental group). All of the patients have had chronic lumbar pain occurring for many years and were diagnosed to confirm that. Patients were admitted, on the basis of an interview and health analysis supported with test results, into a 3-week-long rehabilitation treatment in a daily cycle to the Motor Organ Rehabilitation Centre (Ośrodek Rehabilitacji Narządu Ruchu) in Krzeszowice. The series consisted of 15 treatments, with 5 treatments a week scheduled for three consecutive weeks. One group (the control group) consisted of 41 women and 39 men aged between 44 and 58 ($x50,4; \pm 3,92$), whereas the other (the experimental group) was formed by 46 women and 34 men aged between 42 and 59 ($x51,3; \pm 4,3$).

The patients were divided into the two groups on a random basis using a method of sex- and agewise pairing. People suffering from dementia and psycho-organic syndromes were excluded from the research. Tests and therapeutic sessions were conducted in the Motor Organ Rehabilitation Centre in Krzeszowice. The patients were informed that they could resign from the study at any moment.

The patients were examined twice: before the therapy programme started and on their last day at the centre. In order to assess the quality of life, the SF-36 as well as a modified version of the Laitinen Pain Indicator Questionnaire were used. What is more, both groups were asked to fill in a survey of one's subjective feelings and opinions on the treatment. Additionally, the experimental group took a test requiring theoretical and practical knowledge that could be gained during the lectures offered.

Patients in both groups were subjected to the following therapy programme:

1. Balneotherapy – sulphur baths (whole body) and peat baths (local)
2. Physical therapy – electrotherapy (interferential current or TENS), ultrasounds and magnet therapy
3. Kinesitherapy: the following exercises:
 - relaxing exercises,
 - elongation exercises,
 - exercises improving spine articulation,
 - exercises strengthening muscles,
 - training proper posture retention.

During exercises, the emphasis was put on proper respiratory cycle. Also, breathing gymnastics was introduced between exercises.

What is more, two lectures based on the Back School elements were organized for the experimental group during the therapy. That was the differential factor between the two groups. The lectures were of advisory nature. Their content included:

- basic information on the structure of the spinal cord,
- basic information on the role of the muscles in spine stability,
- back pain as a social problem and a civilisation disease,
- lumbar spine pain and its most common causes,
- the forms of lumbar spine pain treatment and a brief description of them,
- postures supporting pain avoidance,
- ergonomics and the use of it in everyday life.

The following research tools were utilized in this study:

- The SF-36 (Short Form-36) questionnaire consisting of 36 questions grouped into 10 categories (physical

fitness, social ability, emotional health, general perception of health etc.), which form two collective domains – a physical and an emotional one

- A modified Laitinen Pain Indicator Questionnaire whose purpose is to assess pain in relation to its intensity and frequency as well as the use of analgesics and social and professional activity.

Table 1. The modified Laitinen Pain Indicator

Grades	Intensity	Frequency	Analgesics	Social and professional activity
0	Painless	Absence	Not applied	Full
I	Mild pain	Infrequent	Sporadically	Limited
II	Moderate pain	Frequent	Regularly – little	Inactive
III	Severe pain	Very frequent	Regularly - lots	Helpless

The scale range (modified):

Slight pain: 0 - 4 points

Considerable pain: 5 – 8 points

Severe pain: 9 – 12 points

- A survey of a patient's subjective feelings and opinions after the therapy consisting of 5 questions pertaining to the improvement of physical fitness, relief in feeling pain and satisfaction with the therapy etc.
- A test of the experimental group patients' knowledge, whose objective was to check if the selected elements of the Back School and pieces of advice given during the two lectures are familiar to the patients and to what extent they can use that knowledge
- Functional examination datasheet of a patient with the following information:
 - the patient's basic data (including weight, height, BMI).
 - flex-and-reach test (Thomayer functional test)
 - the measurements of spine articulation in lumbar and thoracolumbar sections using a tape measure.

III. RESULTS

1. The analysis of the improvement in the quality of life

As the analysis of the patient datasheet indicates, the two studied groups were generally similar in terms of the parameters such as age, height, weight and BMI (table 2 documents that). The scores in both groups are statistically insignificant ($p > 0,05$), which renders the control group and the experimental group homogenous.

Table 2. The comparison of the two groups involved in the study

	age	height	weight	BMI
Control group	50,40 ±3,92	1,71 ±0,06	76,46 ±9,81	25,90 ±2,70
Experimental group	51,33 ±4,30	1,71 ±0,06	78,06 ±9,05	26,51 ±2,52
Statistical significance	p= 0,61	p= 0,79	p= 0,66	p= 0,70

The results presented in table 3 serve to prove that the therapeutic process implemented had a positive influence on the improvement in the quality of life measured using the SF-36 in both groups. The results turned out to statistically significant, with the significance level amounting to $p=0,00016$. While the difference between the studied groups before the treatment is statistically insignificant ($p= 0,498$), the difference between them after the rehabilitation is of high statistical significance ($p=0,00014$).

Table 3. Arithmetic means, standard deviations and significance levels of differences in the quality of life assessment on part of the patients measured by the SF-36

	Control group	Experimental group	Between the groups	
			before	after
SF- 36 before	43,80 ±16,50	38,17 ±12,56	p= 0,498	p= 0,00014
SF- 36 after	62,60 ±18,76	92,43 ±13,31		
Within a group	p= 0,00016		Statistical significance	

The test results in the form of a chart show the improvement in the quality of life as measured by the SF-36 both in the control and the experimental group and before and after the treatment. The quality of life before the therapy was assumed to be 100%. In the control group, the level rose by 42,92%, while the increase in the experimental group amounted to 142,15%.

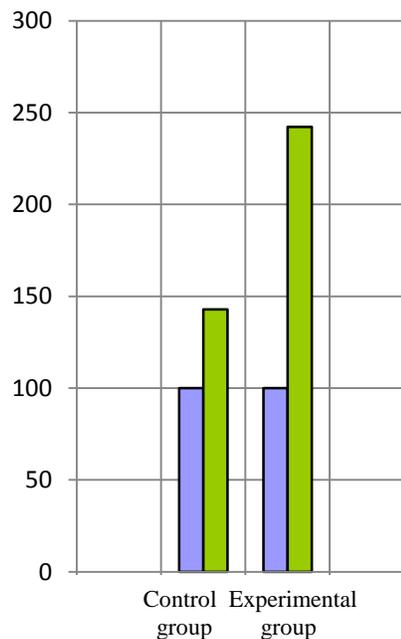


Figure. 1 The comparison of the SF-36 results in both groups before and after the therapy

On the basis of the mean values of those results presented in the table below, a significant influence of the rehabilitation treatment on perception of pain was observed in both groups. The results are statistically highly significant both in the control group ($p= 0,0003$) and in the experimental group ($p= 0,0001$).

What is more, no statistical significance was observed in the groups before the rehabilitation, with the statistical significance level of $p= 0,812$. Statistical significance was observed after the treatment with its level reaching $p= 0,002$.

Table 4. Arithmetic means, standard deviations and significance levels of differences in the results obtained using the modified Laitinen Pain Indicator Questionnaire

	Control group	Experimental group	Between the groups	
			before	after
Pain indicator - before	6,17 ±3,08	6,77 ±2,67	p= 0,812	p= 0,002
Pain indicator - after	4,57 ±2,76	2,07 ±1,79		
Within a group	p= 0,0003	p= 0,0001	Statistical significance	

The results shown on in the chart indicate that pain measured by the Laitinen Questionnaire was decreasing. Its level before the treatment was assumed to be 100% for both groups. After the rehabilitation was over, the pain level was observed to decrease in both groups. The drop was significant in the experimental group. The control group reached a decrease by 25,94%, while in the experimental group that value was 69,43%.

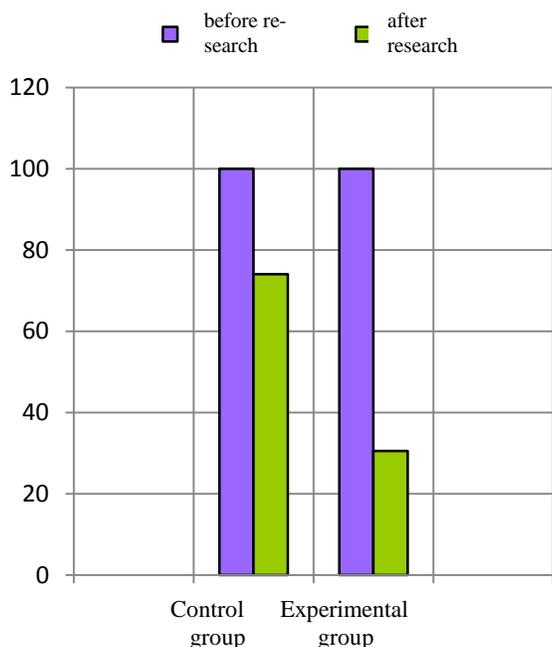


Figure. 2 The comparison of the results obtained using the modified Laitinen Questionnaire in both groups before and after the research

The Laitinen Questionnaire serves to assess four pain-related aspects:

- intensity of pain,
- frequency of pain,
- the frequency of the analgesics use,
- the level of social and professional activity.

It was noted that pain intensity decreased after the therapy in both groups, yet the change was more significant in the experimental group. Before the treatment, only 3% of the control group and 5% of the experimental group ticked the “painless” box in the pain intensity question. After the treatment was over, as much as 13% in the control group and 40% in the experimental group claimed to have no pain.

The pattern of results is similar in relation to the next question in the test – that about pain frequency. Before the treatment, only 5 % of the control group and 3% of the experimental group claimed that they never feel pain. After the rehabilitation was over, 13% of the control group stated that pain did not occur at all. The improvement was more significant in the experimental group, in which 40% declared the absence of pain.

The third aspect measured by the Laitinen Questionnaire is how frequently analgesics are used. 13% of the control group and 20% of the experimental group claimed to use analgesics regularly in large doses. After the finished rehabilitation, the parameter was lowered in both groups. There were only 7% of the patients still using large doses on analgesics regularly. The improvement was exceptionally significant in the experimental group, with 80% of the patients claiming to feel no need to take analgesics at all.

The last aspect of pain measured by the Laitinen Questionnaire is social and professional activity. Before the treatment, 31% of the control group and 13% of the experimental group were fully active in professional and social terms. When the questionnaire was filled in for the second time after the therapy, an increase in this parameter was observed. 43% in the control group and 57% in the experimental group defined their social and professional activity as “full”. This parameter is directly related to the improvement in the quality of life, which is why the results are exceptionally satisfying.

The results of the survey of a patient’s subjective opinions and feelings indicate that there was a statistically significant difference in the responses to question 1: Do you feel better after the rehabilitation? The significance level here was p=0,033. Also, the overall score obtained in the survey was of statistical significance, as the significance level was p= 0,013.

Table 5. Arithmetic means, standard deviations and significance levels of differences in the results obtained in the survey of patients' subjective feelings (the Mann-Whitney U test)

	Control group	Experimental group	Statistical significance
Survey – question 1	0,60 ±0,38	0,81 ±0,30	p= 0,033
Survey – question 2	0,52 ±0,30	0,65 ±0,32	p= 0,146
Survey – question 3	0,55 ±0,30	0,68 ±0,35	p= 0,126
Survey – question 4	0,53 0,39	0,78 ±0,34	p= 0,061
Survey – question 5	0,40 ±0,42	0,61 ±0,42	p= 0,072
Survey – overall	2,60 ±1,44	3,50 ±1,34	p= 0,013

The analysis of the results obtained in the survey of subjective feelings and opinions on the treatment indicates a significant difference in the patients' subjective opinions between the control group and the experimental group.

In the control group, significant improvement was noted in 10 out of 30 studied cases, while in the experimental group the improvement was observed in 16 out of 30 cases, which amounted to 53% of the studied group.

No changes in a patient's condition were recorded in 16 out of 30 cases in the control group, which amounted to 54% of the group. Only 9 patients in the experimental group claimed to experience neither positive nor negative changes.

The results of the test designed to check the knowledge of the patients in the experimental group show that as much as 55% of them were able to provide the correct answers to all the 6 questions in the test, scoring the maximum points. Patients who failed to answer only one of the questions correctly amounted to 36% of the group. Those who provided 2 or 3 wrong answers constituted 5% and 4% of all, respectively. None failed to answer correctly 4, 5 or 6 questions.

The conclusions that can be drawn from these results are that the patients were concentrated during the lectures involving the

Back School selected elements. They were apparently intent on benefitting from what they were taught and use that knowledge in the future in order to improve their quality of life.

A correlation between the pre- and post-treatment differences in the SF-36 results and the knowledge test results in the experimental group was observed. That correlation is statistically significant, with the level reaching $p= 0,004$. The study results, presented in table 7, also point to a statistically significant ($p= 0,006$) correlation between the pre- and post-treatment difference in the Laitinen Questionnaire results and the results of the test on patients' knowledge taken by the experimental group. It was observed that the development of the experimental group's knowledge contributed to the improvement in the quality of life measured by the SF-36 questionnaire. Also, the broadening of knowledge resulted in the decrease in the pain level as estimated using the Laitinen Questionnaire.

Table 6. Correlations between the results of the test on patients' knowledge, the modified Laitinen Pain Indicator Questionnaire and SF-36 quality of life questionnaire after the rehabilitation

	The test on patients' knowledge
SF- 36 – after the therapy	p= 0,745
Pain questionnaire – after the therapy	p= 0,783

Table 7. Correlations between the results of the test on patients' knowledge and the differences in the pre- and post-treatment results of the SF-36 and the modified Laitinen Questionnaire

	The test on patients' knowledge
SF-36 – the difference: before and after the therapy	p= 0,004
Pain questionnaire – the difference: before and after the therapy	p= 0,006

Numerous publications [6-12] on the functional status of patients suffering from severe lumbar spine pain resulting from undergone rehabilitation indicate that the process has a significant influence on the lowered pain perception level.

The authors of this study observed that most of patients point to considerably high values of pain perception, which affects their quality of life in a direct manner. One is justified in assuming that it is the intensifying pain that has a crucial influence on the patient's quality of life as it impairs their mobility, effectiveness at work and simple actions such as bending down or lifting objects.

Both the results of this study and the reports of other authors [2,12-15] indicate that the greatest improvement after rehabilitation is related to pain and patients' subjective feelings about the therapy they underwent. It is reflected in the SF-36.

Hawrylak A. *et al.* [16] examined 150 people aged between 40 and 50, paying special attention to thoracolumbar and lumbar spine articulation in patients suffering from severe pain in the lumbar section. One of the groups was formed by those who were treated only pharmacologically (non-steroidal anti-inflammatory drugs, regenerative drugs and nutritional drugs for compressed nerve roots) and the other by those who were treated both pharmacologically and by (methods applied included: local cryotherapy, TENS, magnet therapy, diadynamic therapy, laser therapy, kinesitherapy and classic massage). Before the therapy, spine articulation data were similar in both groups. After the therapy, the group whose treatment was restricted to pharmacology reached improvement only in frontal plane

The group subjected to complex treatment reached improvement in all of the studied spine articulation planes. The therapeutic process was 6 weeks long. In this paper, which also set out to study lumbar spine articulation, the improvement of all of the measurements on the experimental group was observed during the 3-week-long therapy (supplemented by the Back School programme). The authors have concluded that an additional influence on the improvement of spine articulation was provided by the lectures offered. Since the patients were more focused on exercises and correct posture, their spine articulation was improved in an indirect way.

The study has shown that complex therapeutic programme involving the elements of the Back School resulted in the improvement of the patients' quality of life. What is more, a link between the knowledge acquired during the lectures and relief or partial relief from lumbar spine pain was observed.

Boerner E. *et al.* [17] examined 30 patients aged between 28 and 50 during a 24-day-long therapy. The studied factors were the occurring pain measured on a 10-grade scale (1 being no pain, 10 being constant, strong pain) and lumbar spine articulation. The participants were subjected to identical therapeutic programmes involving classic massage, physiotherapeutic treatments (therapeutic ultrasound, electrotherapy) and kinesitherapy. Before the therapy, the intensity of the pain perceived was recorded to be 7 out of 10 in 25% of the cases.

None of the participants valued their pain to be more than 7. After the treatment was over, the second interview produced identical results, with 25% of all estimating to feel pain on level 7. In this study, better results in terms of pain perception were obtained in both groups. While in the control group a decrease in the pain level by 26% was recorded, in the experimental group the improvement was by 70%. A conclusion was made that the score difference may stem both from wider range of therapeutic treatments, the inclusion of balneotherapy and introduction to the selected aspects of the Back School in the experimental group, in which the drop in the perception of pain reported was statistically significant.

Furthermore, the study of Weigl *et al.* [12] involving 128 patients asked to fill in the WOMAC and SF-36 forms showed that the pain reduction effect, though moderately beneficial, can linger on until as long as 2 years after the rehabilitation. Another observation of theirs was that the improvement of one's physical fitness produces poor or moderate effects and the subjects are back in their original condition within 12 months. That could not be compared to the research results obtained in this study, as the patients' stay in the centre was not lengthy enough. What is more, Weigel *et al.* [12] noticed important though less significant effects in three out of 4 subscales of the SF-36, which serve to measure mental health: vitality, social functions and mental condition to be precise. That remains in agreement with the findings of this study. The SF-36 did not, however, show any changes in the emotional sphere. What is more, Kawasaki *et al.* [9] made an interesting observation which confirms the authorial discussion of pain reduction and improving quality of life in particular aspects. Their idea was to compare the effects of rehabilitation on patients suffering from hip osteoarthritis who underwent hip replacement and rotational acetabular osteotomy. They used the NHP scale to show that within 1 year after the operations, the best results in relation to joint ache and vitality were obtained by those patients who did undergo therapy. Another observation of theirs was that, unlike in the case of Weigel *et al.* [12], the patients who underwent rehabilitation showed the most significant emotional improvement in comparison to other groups. However, this disparity may stem from the use of two different types of questionnaire.

On the basis of this study and the reports of other authors [2,12-17] it can be assumed that the reduction of pain is a very important constituent of the improvement in the quality of life of patients suffering from lumbar spine pain as it affects all the other aspects in either direct or indirect manner. In this study, the analysis of the quality of life before and after the rehabilitation treatment showed statistical significance ($p < 0,05$) in relation to most of the aspects of the SF-36 test and patients' knowledge on their affliction. However, no correlation between

the age of patients, their sex or other parameters such as BMI was observed. That is inconsistent with the findings of Cushnaghan and Dieppe [8], who studied 500 patients to explore the influence of age upon the quality of life and concluded that older patients had a lower esteem on their quality of life.

In the experimental group, selected elements of the Back School were introduced alongside the therapeutic programme in the form of lectures. Thanks to that patients supervised by specialists could acquire knowledge on their problems and the ways of tackling them.

That resulted in a significant correlation with the patients' subjective opinions on the treatment. In this study, the patients who participated in the lectures did better in the examinations using a Stabilizer, particularly those which measured the strength of stomach muscles. Interestingly enough, the greatest improvement was observed in those tests which required most involvement and concentration, which basically relates to the so-called functional capability.

The positive influence of a patient's active participation in the therapeutic process is confirmed by the study of Wiśniewska T. *et al.* The object of their research was the impact of autotherapy on the effectiveness of lumbar spine pain syndrome in 40 patients aged between 28 and 56. The patients were divided into two study groups. The first one received support in the form of kinesitherapy, whereas the second had the additional autotherapy treatment implemented at home. Supplementing the elementary programme with autotherapy, i.e. patients' own effort aimed at their well-being, turned out to be a factor facilitating spinal pain. Active participation and patients' responsibility for their therapy trigger extra energy and motivation which strengthen patients both physically and mentally.

It was observed that mental resistance as well as the approach to one's health and limiting one's activity are also dependent on one's own experiences and those who know their own problem, its results and consequences find it easier to develop them. Therefore, since the cognitive image of the illness triggers active attitudes, the creation of it is of utmost importance.

It has to be emphasized that in the end it is patients who define their own hierarchy of values that determine their quality of life. The essence of that quality is the feeling of happiness and satisfaction, at the foundations of which lies the subjective personal assessment of particular parameters. That is why a survey of patients' subjective feelings and opinions on the therapy was employed in this study. It became a criterion of the assessment of one's mood and satisfaction with one's condition.

That is the kind of a patient's subjective feeling which is especially reflected in the process of developing a higher purpose in order to strategically plan the therapeutic process. For within this approach the most crucial decision is up for the patient to

make as he or she has to find out what is needed for her or him to be happy or satisfied.

On the basis of this research as well as the studies of other authors [6,16] it can be stated that the parameters of the assessment of the quality of life are not all of its determinant factors (as patients in both the groups obtained produced similar results of those parameters). The subjective perception of one's life is also crucial. It can be concluded, then, that the heart of the matter lies in a patient's attitude to solving his or her problems rather than in the nature of those problems itself. The lectures involving the elements of the Back School were aimed precisely at that purpose. Their objective was to give a general idea about the health-related problems experienced by the participating patients and provide them with solutions of those everyday problems, e.g. that of pain and handling it.

On the basis of this study as well as those of other authors [6,16,18], it was observed that satisfaction with one's actions, even in the face of serious limitations, to a certain degree makes up for the influence of chronic lumbar spine pain on the afflicted person's functioning. The authors believe that is so because patients, when helped analyse and solve some of their health-related problems, feel stronger and capable of performing tasks they might have postponed because of their condition. That, in turn, allows the patient to feel normal again.

However, a prerequisite to that attitude is the willingness to understand and accept the therapeutic process in the experimental group and agree to look for solutions in it, which, as it turned out, did in fact contribute to the improvement in the quality of life. It was often the case that the patients who underwent the treatment were satisfied because they knew a lot about their affliction and ways of handling it and were aware of what to do and what to avoid. They claimed to feel strong enough to tackle the problem themselves as they understood how much depended only on themselves.

As observed by Pačalska *et al.*, satisfaction and happiness are largely dependent on the difference between the needs (on the physiological level), desires (on the emotional level) and dreams (on psychological and spiritual level) of a person, and their fulfilment and viable (visible) chances of that fulfilment in the future. Thus, good quality of life is dependent on minimizing that difference. Therefore, one should focus on what increases or decreases one's quality of life. On the basis of the research, it was concluded that the patients in the experimental group improved their quality of life. That was to a large extent owing to the lectures they participated in and the knowledge on their affliction they acquired during them. That was the awareness that allowed them to change their condition for the better, e.g. by avoiding painful postures, in turn decreasing that pain and improving their quality of life.

Thus, the assessment of the aspects of the quality of life of people suffering from lumbar spine pain and their knowledge on their condition may contribute to the introduction of specialist therapeutic programmes and provide a basis for the planning of rehabilitation treatments. It has to be stated, though, that self-assessment quality of life questionnaires are a tool of considerable subjectivity.

A serious problem emerges in cases when patients, who are not even properly diagnosed, have no idea about the causes and biomechanical grounds of their problem. As they undergo several treatments, most commonly physical therapy and relieving exercises which are not aimed at making them aware of the causes of their illness, its consequences or ways to handle it, they are likely to develop the "I received all those treatments so I have to be better now" kind of thinking. Having insight into the current situation, the authors appeal, above all, to do a thorough biomechanical analysis of the problem, both a medical and a therapeutic one, select a proper therapeutic means with reference to the individual problem, introduce appropriate therapeutic techniques, with a special emphasis of functional techniques and educate patients on their problems and the objectives of the therapy.

Supplementing therapeutic programme with education on the selected aspects of the Back School appears to meet the aforementioned diagnostic and therapeutic criteria. Be it the case or not, it is definitely a beneficial addition to the therapy routine. What is more, as thanks to that patients would be treated personally and individually during their treatment, they are bound to be in better mood and take active part in their treatment by means of increased involvement in exercises, greater understanding of them and additional concentration. These should enhance their functional capability and in turn also their quality of life.

IV. DISCUSSION

Numerous publications [6,7,8,9,10,11,12] on the functional status of patients suffering from severe lumbar spine pain resulting from undergone rehabilitation indicate that the process has a significant influence on the lowered pain perception level.

The authors of this study observed that most of patients point to considerably high values of pain perception, which affects their quality of life in a direct manner. One is justified in assuming that it is the intensifying pain that has a crucial influence on the patient's quality of life as it impairs their mobility, effectiveness at work and simple actions such as bending down or lifting objects.

Both the results of this study and the reports of other authors [2,12-15] indicate that the greatest improvement after rehabili-

tation is related to pain and patients' subjective feelings about the therapy they underwent. It is reflected in the SF-36.

Hawrylak A. *et al.* [16] examined 150 people aged between 40 and 50, paying special attention to thoracolumbar and lumbar spine articulation in patients suffering from severe pain in the lumbar section. One of the groups was formed by those who were treated only pharmacologically (non-steroidal anti-inflammatory drugs, regenerative drugs and nutritional drugs for compressed nerve roots) and the other by those who were treated both pharmacologically and by (methods applied included: local cryotherapy, TENS, magnet therapy, diadynamic therapy, laser therapy, kinesitherapy and classic massage). Before the therapy, spine articulation data were similar in both groups. After the therapy, the group whose treatment was restricted to pharmacology reached improvement only in frontal plane

The group subjected to complex treatment reached improvement in all of the studied spine articulation planes. The therapeutic process was 6 weeks long. In this paper, which also set out to study lumbar spine articulation, the improvement of all of the measurements on the experimental group was observed during the 3-week-long therapy (supplemented by the Back School programme). The authors have concluded that an additional influence on the improvement of spine articulation was provided by the lectures offered. Since the patients were more focused on exercises and correct posture, their spine articulation was improved in an indirect way.

The study has shown that complex therapeutic programme involving the elements of the Back School resulted in the improvement of the patients' quality of life. What is more, a link between the knowledge acquired during the lectures and relief or partial relief from lumbar spine pain was observed.

Boerner E. *et al.* [17] examined 30 patients aged between 28 and 50 during a 24-day-long therapy. The studied factors were the occurring pain measured on a 10-grade scale (1 being no pain, 10 being constant, strong pain) and lumbar spine articulation. The participants were subjected to identical therapeutic programmes involving classic massage, physiotherapeutic treatments (therapeutic ultrasound, electrotherapy) and kinesitherapy. Before the therapy, the intensity of the pain perceived was recorded to be 7 out of 10 in 25% of the cases. None of the participants valued their pain to be more than 7. After the treatment was over, the second interview produced identical results, with 25% of all estimating to feel pain on level 7. In this study, better results in terms of pain perception were obtained in both groups. While in the control group a decrease in the pain level by 26% was recorded, in the experimental group the improvement was by 70%. A conclusion was made that the score difference may stem both from wider range of therapeutic treatments, the inclusion of balneotherapy and

introduction to the selected aspects of the Back School in the experimental group, in which the drop in the perception of pain reported was statistically significant.

Furthermore, the study of Weigl *et al.* [12] involving 128 patients asked to fill in the WOMAC and SF-36 forms showed that the pain reduction effect, though moderately beneficial, can linger on until as long as 2 years after the rehabilitation. Another observation of theirs was that the improvement of one's physical fitness produces poor or moderate effects and the subjects are back in their original condition within 12 months. That could not be compared to the research results obtained in this study, as the patients' stay in the centre was not lengthy enough. What is more, Weigel *et al.* [12] noticed important though less significant effects in three out of 4 sub-scales of the SF-36, which serve to measure mental health: vitality, social functions and mental condition to be precise. That remains in agreement with the findings of this study. The SF-36 did not, however, show any changes in the emotional sphere. What is more, Kawasaki *et al.* [9] made an interesting observation which confirms the authorial discussion of pain reduction and improving quality of life in particular aspects. Their idea was to compare the effects of rehabilitation on patients suffering from hip osteoarthritis who underwent hip replacement and rotational acetabular osteotomy. They used the NHP scale to show that within 1 year after the operations, the best results in relation to joint ache and vitality were obtained by those patients who did undergo therapy. Another observation of theirs was that, unlike in the case of Weigel *et al.* [12], the patients who underwent rehabilitation showed the most significant emotional improvement in comparison to other groups. However, this disparity may stem from the use of two different types of questionnaire.

On the basis of this study and the reports of other authors [2,12,13-17] it can be assumed that the reduction of pain is a very important constituent of the improvement in the quality of life of patients suffering from lumbar spine pain as it affects all the other aspects in either direct or indirect manner. In this study, the analysis of the quality of life before and after the rehabilitation treatment showed statistical significance ($p < 0,05$) in relation to most of the aspects of the SF-36 test and patients' knowledge on their affliction. However, no correlation between the age of patients, their sex or other parameters such as BMI was observed. That is inconsistent with the findings of Cushnaghan and Dieppe [8], who studied 500 patients to explore the influence of age upon the quality of life and concluded that older patients had a lower esteem on their quality of life.

In the experimental group, selected elements of the Back School were introduced alongside the therapeutic programme in the form of lectures. Thanks to that patients supervised by

specialists could acquire knowledge on their problems and the ways of tackling them.

That resulted in a significant correlation with the patients' subjective opinions on the treatment. In this study, the patients who participated in the lectures did better in the examinations using a Stabilizer, particularly those which measured the strength of stomach muscles. Interestingly enough, the greatest improvement was observed in those tests which required most involvement and concentration, which basically relates to the so-called functional capability.

The positive influence of a patient's active participation in the therapeutic process is confirmed by the study of Wiśniewska T. *et al.* The object of their research was the impact of autotherapy on the effectiveness of lumbar spine pain syndrome in 40 patients aged between 28 and 56. The patients were divided into two study groups. The first one received support in the form of kinesitherapy, whereas the second had the additional autotherapy treatment implemented at home. Supplementing the elementary programme with autotherapy, i.e. patients' own effort aimed at their well-being, turned out to be a factor facilitating spinal pain. Active participation and patients' responsibility for their therapy trigger extra energy and motivation which strengthen patients both physically and mentally.

It was observed that mental resistance as well as the approach to one's health and limiting one's activity are also dependent on one's own experiences and those who know their own problem, its results and consequences find it easier to develop them. Therefore, since the cognitive image of the illness triggers active attitudes, the creation of it is of utmost importance.

It has to be emphasized that in the end it is patients who define their own hierarchy of values that determine their quality of life. The essence of that quality is the feeling of happiness and satisfaction, at the foundations of which lies the subjective personal assessment of particular parameters. That is why a survey of patients' subjective feelings and opinions on the therapy was employed in this study. It became a criterion of the assessment of one's mood and satisfaction with one's condition.

That is the kind of a patient's subjective feeling which is especially reflected in the process of developing a higher purpose in order to strategically plan the therapeutic process. For within this approach the most crucial decision is up for the patient to make as he or she has to find out what is needed for her or him to be happy or satisfied.

On the basis of this research as well as the studies of other authors [6,16] it can be stated that the parameters of the assessment of the quality of life are not all of its determinant factors (as patients in both the groups obtained produced similar results of those parameters). The subjective perception of one's life is also crucial. It can be concluded, then, that the heart of the matter lies in a patient's attitude to solving his or her prob-

lems rather than in the nature of those problems itself. The lectures involving the elements of the Back School were aimed precisely at that purpose. Their objective was to give a general idea about the health-related problems experienced by the participating patients and provide them with solutions of those everyday problems, e.g. that of pain and handling it.

On the basis of this study as well as those of other authors [6,16,18], it was observed that satisfaction with one's actions, even in the face of serious limitations, to a certain degree makes up for the influence of chronic lumbar spine pain on the afflicted person's functioning. The authors believe that is so because patients, when helped analyse and solve some of their health-related problems, feel stronger and capable of performing tasks they might have postponed because of their condition. That, in turn, allows the patient to feel normal again.

However, a prerequisite to that attitude is the willingness to understand and accept the therapeutic process in the experimental group and agree to look for solutions in it, which, as it turned out, did in fact contribute to the improvement in the quality of life. It was often the case that the patients who underwent the treatment were satisfied because they knew a lot about their affliction and ways of handling it and were aware of what to do and what to avoid. They claimed to feel strong enough to tackle the problem themselves as they understood how much depended only on themselves.

As observed by Pačhalska *et al.*, satisfaction and happiness are largely dependent on the difference between the needs (on the physiological level), desires (on the emotional level) and dreams (on psychological and spiritual level) of a person, and their fulfilment and viable (visible) chances of that fulfilment in the future. Thus, good quality of life is dependent on minimizing that difference. Therefore, one should focus on what increases or decreases one's quality of life. On the basis of the research, it was concluded that the patients in the experimental group improved their quality of life. That was to a large extent owing to the lectures they participated in and the knowledge on their affliction they acquired during them. That was the awareness that allowed them to change their condition for the better, e.g. by avoiding painful postures, in turn decreasing that pain and improving their quality of life.

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V. CONCLUSIONS

1. Physiotherapy is effective at treating spine pain.
2. Enriching standard rehabilitation by selected elements of patient education on the affliction results in a significant reduction of pain in comparison to the patients whose treatment is limited to selected physiotherapeutic treatments.
3. Making patients aware of the causes and the type of their ailment by means of educating them through prevention programmes has a significant impact on the improvement in the quality of life of the people suffering from lumbar spine pains.

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