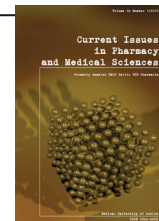


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The impact of non-pharmacological treatments for diseases of the locomotor system on the prescribed drug use and lifestyles of the patients in the sanatoria in Busko-Zdroj

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The article is the result of research on the impact of non-pharmacological therapies for diseases of the locomotor system on the prescribed drug use and lifestyles of the patients of the sanatoria in Busko-Zdroj. The reported research uses primary and secondary measures. The former includes the assessment of the impact of non-pharmacological sanatorium treatments for locomotor system diseases on the use of prescribed drug regimes, while the latter is aimed at assessing the patients' quality of life. The research was conducted on adult patients of both genders in the sanatoria in Busko-Zdroj. The subjects were patients suffering from disorders of the musculoskeletal system such as rheumatoid arthritis, ankylosing spondylitis, osteoarthritis, osteoporosis and discopathies. The research included two visits, the first at the start of the research and the second at the end of the research. The patients were examined for a period of three consecutive weeks. The study involved 170 patients, 50% of them were women and 50% men.

A decline in the use of painkillers and anti-inflammatory drugs makes a very interesting finding. After the first week, as many as 38% of the examined patients limited the use of painkillers and/or anti-inflammatory drugs. After the second week, 62% of the patients reduced the use of the drugs, and after the third week of treatment, up to 90% of the patients did so. The improvement of patients' lives is noticeable in the psychological, physical and motor fields.

INTRODUCTION

Degenerative and inflammatory diseases of the locomotor system are quite common. One of the most bothersome symptoms of these diseases is the pain felt by the patient. Physical activity, such as work, exercising and doing sport is not only the basis of the patient's fitness, but it also determines long-term health effects. Indeed, Roizen has demonstrated that a twenty-minute walk every day helps to minimize the risk of heart attack by 15-30%. However, for such effects to be noticeable, one has to follow the correct model of mobility and physical exercise from an early age [1]. A lack of physical activity gradually leads to the degeneration of the locomotor system [15]. Degenerative joints diseases develop in old age, and these affect all synovial joints. This degeneration is usually the result

of micro-injuries of the articular cartilage by rheumatoid factors or the deposition of various substances. Moreover, elderly people often suffer from degenerative changes of the spine (mainly in its cervical and lumbar sections). Other common problems concerning the locomotor system are degenerative changes in the femoral articulation. In the initial stage of such, the patient feels a pain. As a result, the range of the motion of the femoral articulation is made limited, there are contractures of the hip and a shortening of the lower extremity. Apart from the changes in the hip area, there are degenerative changes in the knee joint. The last group of the most common diseases of the locomotor system includes degenerative changes and rheumatoid arthritis of the hand joints. A symptom of such degeneration is the presence of Heberden's or Bouchard's nodes [10,12,15]. The aforementioned may affect any joint depending on the burden of arthritis.

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One can identify three basic categories of treatment of lesions in the locomotor system: non-pharmacological, pharmacological and surgical. Pharmacological methods mainly include administration of non-steroidal anti-inflammatory drugs (NSAIDs) and analgesics which reduce muscle tension, as well as substance administered intra-articularly [9,10,12,15]. NSAIDs may cause a number of undesirable side effects due to their mechanism of action, particularly the inhibition of prostaglandin synthesis. Due to the inhibition of the prostaglandin synthesis, NSAIDs may cause bleeding complications: gastropathy bleeding and bleeding in the upper gastrointestinal tract. They also reduce the blood flow in the kidneys, hence, bringing about retention of sodium and water. Apart from the inhibition of the synthesis of prostaglandin, NSAIDs can cause serious complications arising from allergenic action, damage to the hematopoietic system, liver and skin. The severity of the undesirable effects depends on the dose and the length of time the drug was used for [3-8,11,19].

Surgical methods of the treatment of locomotor system diseases are expected to relieve the burden of arthritis. Such surgeries are called 'corrective osteotomy'. They involve the replacement of the damaged joints with bio-tolerant counterparts [9,10].

The third group of the treatments of the locomotor system diseases are the so-called 'non-pharmacological methods'. They include sanatorium, orthopedic and physical treatments [2]. Among the range of sanatorium treatments provided are massage, inhalations, kinesitherapy, hydrotherapy and physiotherapy.

The town of Busko-Zdroj, for over 160 years, has been famous for its popular health resort. The sanatoria in Busko-Zdroj offer a true gift of Nature – sulfide and iodine brine waters unique to the region. The town's natural resources of medicinal waters and climatic conditions have made it possible that, for over 200 years, patients have been effectively treated at the health resort for rheumatological, neurological, cardiological, dermatological disorders, as well as children's cerebral palsy [2,13,14,20].

The aim of the study is the assessment of the non-pharmacological treatment in patients with locomotor system diseases on prescribed drug use and quality of life.

MATERIALS AND METHODS

The objective of the study was the evaluation of the impact of the non-pharmacological treatments in the sanatoria in Busko-Zdroj for diseases of the locomotor system on the use of prescribed drugs by the patients, as well as on their lifestyle choices. Primary and secondary indicators were used in this work. The first group of indicators included ascertaining the impact of non-pharmacological, sanatorium treatments for diseases of the locomotor system on the type and quantity of prescribed drug administration. The other group concerned assessments of the quality of life led by the patients. The study was conducted on adult patients of both genders in the sanatoria in Busko-Zdroj. The patients suffered from disorders of the locomotor system such as rheumatoid arthritis, ankylosing spondylitis, osteoarthritis, osteoporosis and discopathies. The study included two

visits, the first one at the start of the study and the second at the end of the study. The patients were examined for three consecutive weeks.

The research tool we used was an original questionnaire with the 0-10 Visual Analogue Scale (VAS) pain scale, modified Lips's scale (Qualeffo-41) and quality of life questionnaire SF-36 (Polish version). A statistical analysis of the research was conducted at the significance level $\alpha = 0.05$. To evaluate the differences between the study results for three consecutive weeks, the Friedman ANOVA by ranks was used, with Kendall's concordance coefficient for repeated measures.

The study was approved by the Ethics Committee of the Medical University of Lodz (Poland) – 74/2013

RESULTS

We examined 170 patients. 50% of which were men and 50% women. Most of the patients were aged 61-80 ($N=119$, 70%), and the majority suffered from hypertension (61%), osteoporosis (24%) and thyroid diseases (20%). In our study, we assessed pain intensity using VAS pain scale. The findings from three consecutive weeks are shown in Figure 1. After the performed treatments in the second week, our assessment showed that the pain intensity ($p < 0,05$) decreased from the initial mean value of 5,55, to 4,24 in the 0-10 VAS pain scale. Furthermore, between the first and third weeks, the pain intensity ($p < 0,01$) was reduced from 5,55 points to 2,71 points. A questionnaire was used to evaluate the patients' psychological and mental state, their physical fitness, as well as the possibility of reducing the analgesics and anti-inflammatory medicines they took. We also studied the patients' mental condition with regard to their emotional reaction towards the diseases they suffered from, especially their neurotic state. Table 1 shows the variables which changed most during the research period.

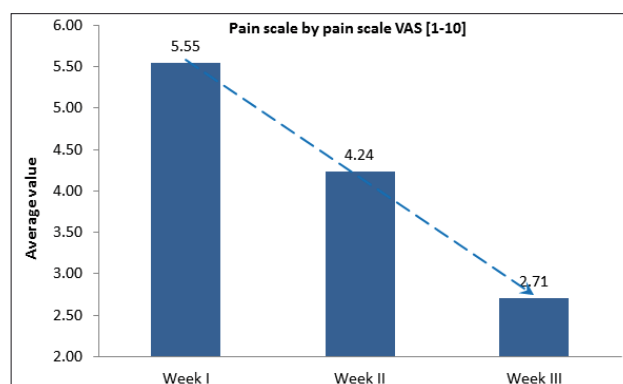


Figure 1. Average values of pain in the pain scale VAS

The findings have shown that in all factors concerning the patients, there was a significant improvement in their general fitness and attitude ($p < 0,05$). It seems that the greatest positive impact of sanatorium treatments is observed after the third week (Tab. 1). However, a positive effect was already observable in the second week of the treatment. Indeed, it is also noteworthy that after the first week of treatment, 99% percent of the patients requested analgesics and anti-inflammatory medicines. In the second week, 93%

Table 1. Statistics of the patients' conditions which changed to a great degree within three weeks of treatment

No	Coefficient	Significance	Research week		
			I	II	III
1	Use of analgesics and anti-inflammatory drugs	$p < 0,05$	N=166; 99%	N=158; 93%	N=97; 57%
2	Frequency of the occurrence of pain throughout the year	$p < 0,05$	N=25; 15%	N=23; 14%	N=15; 9%
3	Depressed mood due to pain	$p < 0,05$	N=17; 69%	N=99; 61%	N=81; 50%
4	Pain which in a great degree disturbs daily activities	$p < 0,05$	N=54; 32%	N=16; 10%	N=12; 7%
5	"Little" or "significant" improvement in the patient's health condition compared to the condition of the previous year	$p < 0,05$	N=47; 27%	N=98; 59%	N=132; 78%
6	Limitation of daily activities in a large degree	$p < 0,05$	4% - 51%	2% - 29%	1% - 12%
7	Problems with daily activities due to emotions	$p < 0,05$	41% - 62%	18% - 50%	2% - 16%
8	Feeling of happiness (often, all the time)	$p < 0,05$	N=53; 34%	N=71; 43%	N=100; 63%
9	Felling of being tired (often, all the time)	$p < 0,05$	N=34; 21%	N=14; 9%	N=3; 2%
10	Impact of patient's health or his/her emotional condition in social relations	$p < 0,05$	N=34; 20%	N=17; 10%	N=16; 10%
11	Reduction of the use of analgesics and/or anti-inflammatory drugs	$p < 0,05$	N=63; 38%	N=104; 62%	N=148; 90%

of the patients requested the prescribed medicinals, yet in the third week, only 57% did so. Thus, after three weeks of treatment, we saw a decrease of pain by approximately 36%. Furthermore, our work demonstrates that 15% of the patients who were in continual pain prior to their spa visit found relief after the first week, following the second week – by an additional 1%, but in the third week – by 9%. What is more, at the beginning of the treatment ($p < 0,05$), a depressed mood was observed in 69% of the examined patients, in the second week, this decreased to 61% and by the third week this figure fell to 19%. Of all the examined patients, 32% declared that pain had accompanied them in their daily activities. The number of such patients stating so dropped to 10% by the end of the second week, and to 7% after the third week. At the beginning of the treatment regime, many patients also put forth that they had emotional problems, indeed, nearly 62% of the patients in the early treatment stated that they had problems with their daily activities that resulted from emotional problems. After the second week of the treatment, 50% of the patients noted that they still felt they had such problems, and in the third week, only 16% stated the presence of such a burden. Figure 2 reveals in detail the self-assessed problems with the performance of daily activities induced by held emotional problems. As seen

in this figure, the studied groups held the opinion that the biggest problems concerned the need to limit their working time and other activities, as well as the occurrence of various difficulties in carrying out these activities. However, about 34% of the patients after the first week of their visit had a feeling of happiness which increased in the coming week to 43%, and after the third week, to 63%. Moreover, the very high degree of fatigue as observed in 21% of the patients in the first week, was reduced to 2% after the third week. At the same time, the patients were more active, and showed an increased need for social contacts. It can be said, therefore, that the pain brought about by the diseases they suffered from often limited their social contacts. In the first week, 20% of the patients showed such a tendency, but after the third week this figure fell to only 10%.

Beyond the aforementioned, after treatment at the spa, the figure of 69% with regard to patients who put initially forward that they felt a depressed mood associated with physical pain, was reduced to 50%. Moreover, 30% of the patients felt a decrease in activity limitations, i.e. running, carrying heavy items and doing sports requiring a lot of commitment, and about 39% of the patients demonstrated improvements in their physical function connected with activities demanding moderate effort, for example, moving a table about, vacuuming or bowling. There was also a perceived growth of efficiency concerning the carrying of their shopping home from a local store. What is more, the patients stated that they had improved by 29%, their efficiency of walking up a flight of stairs, and by 41%, of reaching the first floor. Furthermore, they self-assessed themselves to be 45% more efficient in terms of bending or kneeling, and by 30% at coping better at walking distances of one kilometer.

Beyond this, following treatment, the patients held the opinion that they had decreased their limitations of carrying out work and other activities by 37%, and that they shortened the time of the performed work and activities by 43%. Moreover, they felt that they were able to carry out their daily activities better than before by 43%. The patients also stated that they were less nervous after the treatment by 26%, as compared with a figure of 62% as self-assessed in the initial period of the treatment. After the first week of the treatment, the patients also believed they had higher

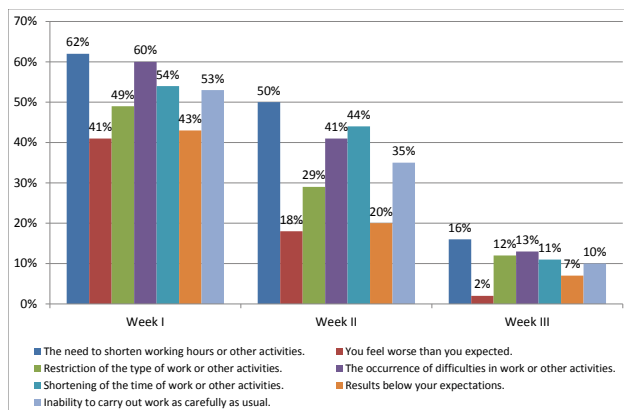


Figure 2. Graph of indicators for the answers to the question: What kind of problems concerning your work or daily activities do you have due to your emotional problems (such as depression or nervousness) after the second and third week of treatment?

self-esteem, and they had noticeably increased their self-confidence and vigour. By approximately 21%, they felt that they had reduced their risk of nervous breakdown. The patients also perceived themselves as feeling less exhausted by 21%, and by 25%, made more social contacts due to their improved health.

DISCUSSION

In our study, we have presented a positive assessment of the factors associated with the process of treatment within a sanatoria, with regard to the rehabilitation of the patient. It and other studies demonstrate during a stay at a recognized sanatorium, within a three-week interval, one can observe improvement related to psychological aspects, pain reduction, as well as in the general condition of the patient in relation to the health problems for which they were treated. Prior to rehabilitation, however, one should take into account various risk factors. One of these is coronary artery disease [9]. Yet, as shown by the authors, stable coronary artery disease does not affect the functional status of the patient. The authors have also revealed that unstable coronary artery disease needs adequate physical activity, including rehabilitation. Such patients should be rehabilitated under supervision.

In this study, it has been reported that pain is significantly reduced during the period of rehabilitation. Also, it has been shown that the general condition of the patient was improved. Of note: in addition to the recommendations for walking and exercising, a diet high in proteins, vegetables and fruit is of great importance, as well as the wearing of proper foot wear. Unfortunately, back pain is a persistent problem by nature, yet by following the above-mentioned recommendations, its recurrence may be prevented.

A previous study has demonstrated that musculoskeletal pain is accompanied by low physical activity, smoking, obesity and mental exhaustion. This revelation is consistent with Vindigni's studies, who also points towards genetic factors for such condition being experienced [17]. In addition to the use of certain algorithms for the treatment of pain as formulated by Krasuski [12] and psychotherapy [1], the authors have underlined that sanatorium treatment, beyond alleviating pain and difficulties in performing daily activities, also reduces the psychological ailments, which, as has been shown by other researchers, are a consequence of health issues.

The results of our research has established that sanatorium treatment mitigates pain. Other information brought out is the positive impact of a series of treatments, i.e. sulphide bath (93%), classical massage (55%) and cryotherapy (47%). In such, the patients stated that they felt most satisfied with sulphide bath (89%), cryotherapy (40%), and classical massage (37%), as these significantly reduce the pain the patients suffer from [1].

In order to effectively prevent or delay the process of the degradation of the locomotor system, one should try to be physically active. There is no doubt that adequate physical activity is beneficial to the human organism and can replace to a certain degree, almost any medication (as it is known,

pain is not only the result of degenerative processes which progress with age). However, regular physical activity and non-pharmacological therapies also slow down the aging process. Thereby, such treatment enhances motorics and improves the elasticity of tissues. What is more, neglecting physical activity significantly increases the risk of the sprains, falls and resulting fractures which in old age, may lead to serious complications [9,15,16,18].

A previous study has shown that certain methods of physical therapy, for example, cryotherapy, ionophoresis or laser, reduce pain [16]. Such research focuses on non-pharmacological treatments for diseases of the locomotor system. However, it should be noted that proper non-pharmacological therapy is based primarily on information and patient education. It is important, for example, for the patient to reduce his/her body weight and have a proper diet. Moreover, adequate orthopedic measures should be taken in order to prevent falls, injuries and fractures. In addition to educational factors, one should take care of appropriate physical activity so as to strengthen the relevant muscle groups and prevent a restricted range of motion in the joints and pain [9,10,12,16,18].

CONCLUSIONS

Non-pharmacological treatment reduces the need for the analgesics which may lead to complex complications. Furthermore, non-pharmacological treatment should focus primarily on the elimination or partial reduction of the factors inducing locomotor system diseases.

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