The Journal of Neurological and Neurosurgical Nursing
Pielęgniarstwo Neurologiczne i Neurochirurgiczne

Wydawnictwo Państwowej Akademii
Nauk Stosowanych we Włocławku
ul. Mechaników 3, pok. 20
87-800 Włocławek

eISSN 2299-0321 ISSN 2084-8021
https://apcz.umk.pl/PNIN

DOI: 10.15225/PNN.2024.13.3.3 JNNN 2024;13(3):106–111 **Original**

Impact of Sanatorium Treatment on the Quality of Life of Patients with Lumbosacral Spine Pain Syndrome

Wpływ leczenia sanatoryjnego na jakość życia pacjentów z zespołem bólowym odcinka lędźwiowo-krzyżowego kręgosłupa

Lech Grzelak[1,2], Agnieszka Kikosicka[1], Agnieszka Szajerska[2], Mateusz Szostak[2]

❶ Faculty of Health Sciences, State Academy of Applied Sciences in Włocławek, Poland
❷ Department of Neurosurgery, Mikołaj Kopernik Specialist Municipal Hospital in Toruń, Poland

Abstract

Introduction. Lumbosacral spine pain increasingly impacts the quality of life for many individuals, affecting both physical and social aspects. Addressing this issue through effective prevention and treatment is crucial to mitigating its negative effects on society, especially in developed countries.
Aim. The aim of this study was to analyse the impact of sanatorium treatment on the quality of life of patients with lumbosacral spine pain syndrome.
Material and Methods. The study was conducted on a group of 50 patients who were referred for sanatorium rehabilitation for a 28-day period. This group was selected on the basis of medical history and diagnosed lower lumbosacral pain syndrome not qualified for surgical treatment. Prospective research employed diagnostic survey methods using a questionnaire technique. Assessment of quality of life was conducted using a questionnaire constructed in two parts. The first part, developed by the authors, included questions regarding socio-demographic variables as well as questions related to the functional status, mental condition, and pain experienced by the patients. The second part was the standard SF-36 quality of life questionnaire.
Results. The analysis of the conducted research indicates that sanatorium treatment significantly differentiates the quality of life assessment and its selected indicators ($p<0.05$) for general health perceptions ($t=2.858$; $p=0.006$), physical functioning ($t=7.923$; $p=0.000$), mental health ($t=3.440$; $p=0.000$), bodily pain ($t=11.796$; $p=0.000$), and social functioning ($t=5.927$; $p=0.000$).
Conclusions. Quality of life assessment is higher after sanatorium treatment than before treatment. Selected indicators of quality of life, such as physical, mental, and social functioning, improved after sanatorium treatment. **(JNNN 2024;13(3):106–111)**
Key Words: quality of life, SF-36, spine pain syndrome

Streszczenie

Wstęp. Ból kręgosłupa lędźwiowo-krzyżowego ma coraz większy wpływ na jakość życia wielu ludzi, zarówno w kategoriach fizycznych, jak i społecznych. Konieczne jest podejmowanie działań mających na celu wprowadzenie profilaktyki i skuteczne leczenie tego schorzenia, aby ograniczyć jego negatywny wpływ na społeczeństwo, szczególnie w krajach wysokorozwiniętych.
Cel. Celem pracy była analiza wpływu leczenia sanatoryjnego na jakość życia kuracjusza z zespołem bólowym odcinka lędźwiowo-krzyżowego kręgosłupa.
Materiał i metody. Badania przeprowadzono na grupie 50. kuracjuszy, skierowanych na rehabilitację sanatoryjną na czas pobytu 28 dni. Grupa ta została wyłoniona na podstawie wywiadu i zdiagnozowanego zespołu bólowego dolnego odcinka lędźwiowo-krzyżowego nie zakwalifikowanego do leczenia operacyjnego. W prospektywnych badaniach posłużono się metodą sondażu diagnostycznego z wykorzystaniem techniki ankietowej. Do oceny jakości życia, skonstruowano kwestionariusz ankiety składający się z dwóch części. Część pierwsza — autorska zawierała pytania dotyczące zmiennych

socjo-demograficznych oraz pytania dotyczące stanu funkcjonalnego, stanu psychicznego i występujących dolegliwości bólowych u kuracjuszy. Część druga to standardowy kwestionariusz oceny jakości życia SF-36.
Wyniki. Z analizy przeprowadzonych badań wynika, że leczenie sanatoryjne istotnie różnicuje ocenę jakości życia i jej wybranych wskaźników (p<0,05) dla ogólnej oceny zdrowia (t=2,858; p=0,006), funkcjonowania fizycznego (t=7,923; p=0,000), zdrowia psychicznego (t=3,440; p=0,000), dolegliwości bólowych (t=11,796; p=0,000) oraz funkcjonowania socjalnego (t=5,927; p=0,000).
Wnioski. Ocena jakości życia jest wyższa po leczeniu sanatoryjnym niż przed leczeniem. Wybrane wskaźniki jakości życia takie jak: funkcjonowanie fizyczne, psychiczne i socjalne uległy polepszeniu po leczeniu sanatoryjnym. **(PNN 2024;13(3):106–111)**
Słowa kluczowe: jakość życia, SF-36, zespół bólowy kręgosłupa

Introduction

Lumbosacral spine pain increasingly impacts the quality of life for many individuals, affecting both physical and social aspects. Addressing this issue through effective prevention and treatment is crucial to mitigating its negative effects on society, especially in developed countries. As the disease progresses, the need for specialised rehabilitation care grows, which is crucial for improving the patient's function and quality of life. Spa rehabilitation is a highly comprehensive process that utilises various values and resources such as accessibility, comprehensiveness, continuity, natural resources, and climatic conditions [1]. Time spent in a sanatorium can contribute to developing healthy habits and regulating the daily rhythm. The "sanatorium regimen" has a notably positive impact on the mental health of patients, encompassing various elements such as a schedule of treatments, meals, rest, and sleep. This structured plan not only provides patients with the appropriate therapies but also creates a cohesive environment conducive to both physical and mental recovery, fostering a sense of security. Patients, cared for by qualified staff, often forget about daily life problems, which is crucial in combating stress — a leading cause of spine pain [2,3]. As a result, if patients are open to lifestyle changes and follow medical advice, the time spent in a sanatorium can lead to long-term improvements in health and well-being.

Spinal pain syndromes may involve various conditions such as hernia of intervertebral disc, osteoarthritis, or other musculoskeletal dysfunctions. The incidence rate is higher than that of ischaemic heart disease or hypertension. Spinal pain syndromes, especially in the lumbosacral region, are common and can significantly impact an individual's life. They are often caused by various factors, such as a sedentary lifestyle, lack of physical activity, poor posture habits, genetic factors, or medical conditions like soft tissue disorders of the musculoskeletal system, obesity, and depression. Spinal pain refers to pain localised along the dorsal side of the body, along the vertical axis [4]. Patients with spinal pain syndromes are among the largest groups benefiting from health resort treatment.

Health resort treatment aims to supplement and continue outpatient or hospital care, focusing on a broad spectrum of activities designed to improve the patient's health and overall condition. These methods include physical therapy (using various forms of physical energy such as heat, light, and currents), physiotherapy, kinesiotherapy, balneotherapy, manual therapy, hydrotherapy, occupational therapy, functional training, cognitive training, and health education. Educational interventions (teaching patients how to manage their illness), psychological support (help in coping with emotional difficulties related to the disease), dietary counselling (ensuring a proper diet), and, in some cases, pharmacotherapy (use of medication to improve health) are also provided [5]. Health resort treatment emphasises a holistic approach to the patient, addressing various aspects of their health and well-being. This is particularly important for conditions that require comprehensive care. The goal of rehabilitation is to restore maximum functionality and independence to the patient, as well as to improve their quality of life. A combination of various physical treatments, aquatic treatments, balneotherapy, and kinesiotherapy exercises as part of health resort rehabilitation can produce highly positive results. Through such a holistic approach, patients have the opportunity to improve many aspects related to pain and dysfunction of the musculoskeletal system [6].

The aim of this study was to analyse the impact of sanatorium treatment on the quality of life of patients with lumbosacral spine pain syndrome.

Material and Methods

Study Design

The study was conducted at the Wieniec-Zdrój health resort in 2024. Participants (patients) were informed that the study was anonymous, voluntary, and free of charge. It required them to fill out a questionnaire twice — once at the beginning of their stay and again at the end of the health resort treatment. The study was conducted after obtaining prior approval from the

Bioethics Committee No. 46/23 of the State Academy of Applied Sciences in Włocławek.

Methods

Prospective research employed diagnostic survey methods using a questionnaire technique. Assessment of quality of life was conducted using a questionnaire constructed in two parts. The first part, developed by the authors, included questions regarding socio-demographic variables as well as questions related to the functional status, mental condition, and pain experienced by the patients. The second part consisted of the standard SF-36 Quality of Life Questionnaire [7]. This questionnaire is a self-assessment tool used to evaluate functioning across eight indicators of quality of life: 1) general health perceptions; 2) physical functioning; 3) physical role limitations; 4) emotional role limitations; 5) bodily pain; 6) vitality; 7) social functioning and 8) mental health [7,8].

The Polish version of the SF-36 questionnaire was developed under the initiative of the Servier team at the Institute of Cardiology in Warsaw [7]. It was assumed that the total score for a given indicator reflects its positive or negative value. The principle is that the higher the score, the more positive the self-assessment in terms of the adopted quality of life concepts. The questionnaire consists of 11 questions containing 36 statements, which are subjective assessments of health in terms of the eight indicators. The sum of points in these categories allows an overall assessment of health status. The Polish version of the questionnaire assumes that the highest score indicates the lowest level of quality of life, while the lowest score reflects the highest level of quality of life [8]. Results are interpreted according to a key [9]. The physical dimension of quality of life is analysed using scales I, II, IV, and VIII (maximum score: 103); the mental dimension of quality of life is analysed using scales III, V, VI, and VII (maximum score: 69). The overall quality of life index provides a maximum of 171 points.

Material

The study involved a group of 50 patients referred for sanatorium rehabilitation for a 28-day period. This group was selected on the basis of medical history and diagnosed lower lumbosacral pain syndrome not qualified for surgical treatment. The inclusion criteria were: non-surgical treatment of lumbosacral spine pain syndrome at Wieniec-Zdrój health resort; completion of the full 28-day rehabilitation programme; and voluntary consent to participate in the study. The exclusion criteria were other medical conditions, failure to complete the full 28-day rehabilitation programme, or refusal to participate in the study.

Ethical Considerations

Written consent to conduct the study was obtained from the President and Vice President of Wieniec-Zdrój Health Resort, as well as approval from the Bioethics Committee at the State Academy of Applied Sciences in Włocławek. The study was conducted in accordance with ethical principles and the requirements of the Declaration of Helsinki, and participants were informed about the study conditions and provided informed consent.

Data Analysis

The results were analysed using Microsoft Excel and the STATISTICA software version 18.0. Quantitative statistics and descriptive statistical methods were used: position measure — mean (M), the measure of variability — standard deviation (SD), and standard error. The t-test for independent and dependent samples was used to assess group differences. A probability value of $p<0.05$ was considered statistically significant.

Results

General Health Perception and Quality of Life

The analysis of the conducted study indicates that sanatorium treatment significantly differentiates the assessment of quality of life and its selected dimensions ($p<0.05$). The participants significantly improved their perception of their health after sanatorium treatment (M=2.34) compared to before the treatment (M=2.54) (Table 1).

Table 1. General health perception and quality of life before and after sanatorium treatment (N=50)

Variable	M	SD	T-test for dependent samples
Health perception			
Before treatment	2.54	0.838	t=2.858 p=0.006
After treatment	2.34	0.798	

M — mean; SD — standard deviation

Physical Functioning and Quality of Life

The study indicates that the participants significantly improved their physical functioning after sanatorium treatment (M=7.24) compared to before the treatment (M=18.64). Results from the t-test for dependent samples indicate significant differences in the assessment of daily activity limitations before and after sanatorium treatment (p=0.000). Participants experienced significantly fewer difficulties in daily functioning after completing the treatment (M=10.72) compared to before the treatment (M=18.12) (Table 2).

Table 2. Physical functioning and quality of life before and after sanatorium treatment (N=50)

Variable	M	SD	T-test for dependent samples
Physical functioning			
Before treatment	18.64	9.638	t=7.923 p=0.000
After treatment	7.24	6.235	
Physical role limitations			
Before treatment	18.12	13.505	t=6.477 p=0.000
After treatment	10.72	9.579	

M — mean; SD — standard deviation

Mental Functioning and Quality of Life

Sanatorium treatment had a significant impact on the mental well-being of the participants (p<0.05). After the treatment, participants rated their mental health more positively (M=13.04) compared to before the treatment (M=18.32). The t-test results for dependent samples show that participants rated the mental aspect of life significantly better after the treatment (M=13.56) than before the treatment (M=29.30) (Table 3).

Table 3. Mental functioning and quality of life before and after sanatorium treatment (N=50)

Variable	M	SD	T-test for dependent samples
Mental health			
Before treatment	18.32	6.665	t=3.440 p=0.000
After treatment	13.04	4.209	
Mental aspect			
Before treatment	29.30	19.141	t=8.445 p=0.000
After treatment	13.56	10.899	

M — mean; SD — standard deviation

Bodily Pain and Quality of Life

The results of the t-test for dependent samples demonstrated significant differences in pain perception before and after sanatorium treatment (p<0.05). After the treatment, participants reported significantly less frequent pain (M=2.60), and fewer participants described the frequency of pain as "frequent" or "very frequent" (M=1.92). Moreover, they experienced less negative impact of pain on their professional and domestic work (M=0.68) compared to before the treatment (M=5.46; M=3.66; M=1.80, respectively) (Table 4).

Table 4. Bodily pain and quality of life before and after sanatorium treatment (N=50)

Variable	M	SD	T-test for dependent samples
Pain perception			
Before treatment	5.46	1.929	t=11.796 p=0.000
After treatment	2.60	1.784	
Pain frequency			
Before treatment	3.66	1.239	t=9.776 p=0.000
After treatment	1.92	1.226	
Pain's impact on work			
Before treatment	1.80	1.010	t=8.427 p=0.000
After treatment	0.68	0.713	

M — mean; SD — standard deviation

Social Functioning and Quality of Life

The study found that participants significantly (p=0.000) improved their social functioning after sanatorium treatment (M=0.42) compared to before the treatment (M=1.32). Additionally, participants rated their overall quality of life significantly better (p=0.000) after the treatment (M=43.32) compared to before (M=76.54) (Table 5).

Table 5. Social functioning and quality of life before and after sanatorium treatment (N=50)

Variable	M	SD	T-test for dependent samples
Social functioning			
Before treatment	1.32	1.236	t=5.927 p=0.000
After treatment	0.42	0.673	
Quality assessment			
Before treatment	76.54	31.885	t=39.885 p=0.000
After treatment	43.32	19.051	

M — mean; SD — standard deviation

Discussion

The aim of this study was to analyse the impact of sanatorium treatment on the quality of life of patients with lumbosacral spine pain syndrome. Selected quality of life indicators — general health perceptions, physical functioning, bodily pain, social functioning, and mental health — were analysed before and after the treatment.

The findings of the study indicate that sanatorium treatment significantly improves the quality of life and its dimensions ($p<0.05$). Participants reported better general health after the treatment (M=2.34) compared to before (M=2.54), improved social functioning (M=0.42) compared to before (M=1.32), better physical functioning (M=7.24) compared to before (M=18.64), and significantly better quality of life overall (M=43.32) compared to before (M=76.54). The study shows that sanatorium therapy significantly improves the quality of life, with participants reporting noticeable improvements in their health.

Bojczuk et al. [10] conducted a study on 35 patients with lower back pain, showing that rehabilitation significantly improved social activity, professional involvement, and the ability to achieve personal goals. Exercise positively impacted social engagement, daily work, and social interactions. In the study by Bojczuk et al., patients responded to the question about the impact of treatment on quality of life, indicating that their quality of life changed "a lot" (40%), "moderately" (37%), and "slightly" (23%). None of the respondents reported no change (0% "not at all").

Depa et al. [11], in a study of 75 patients, assessed the effect of rehabilitation on lumbar spine pain, finding a reduction in pain intensity for 59% of respondents. Depa also examined the impact of rehabilitation on spinal mobility, with 57% of participants showing improved movement in the lumbar region. Klimaszewska et al. [12] also investigated the impact of rehabilitation exercises on quality of life indicators in her study. The results showed an improvement in quality of life, which was reflected in both professional and social aspects of the participants' lives. Śliwiński et al. [13], in their study involving a group of 38 individuals undergoing rehabilitation, examined the extent of quality of life reduction depending on the progression of the disease. Their findings highlighted the need to incorporate quality of life indicators into the rehabilitation process, as this provides valuable insights into the patient's condition and their approach to illness and treatment.

Jurczak et al. [14], studying a group of patients, demonstrated that health resort treatment had a more favourable impact on women's subjective quality of life compared to men's. The greatest improvement after sanatorium treatment was observed in the areas of role limitations due to physical health (physical role limitations (RP) — by 48.33%), emotional problems (emotional role limitations (RE) — by 47.06%), and bodily pain (BP — by 47.09%), while the least improvement was noted in general health (GH — by 3.59%).

Wardeńska et al. [15] studied 30 patients with hip joint disorders, showing that after 4 weeks of rehabilitation, there was a reduction in pain, increased mobility, and overall improvements in physical and mental health. Most participants reported improvements in nearly all aspects of bodily function.

The results of the present study significantly demonstrate the improvement in mental health, emotional life, and mental well-being following sanatorium treatment, leading to a higher subjective perception of quality of life. Positive mental health allows individuals to cope with difficulties and prevents health deterioration.

Studies conducted on patients at the Busko-Zdrój health resort with motor dysfunctions evaluated the impact of health resort treatments on pain reduction and psychological improvements. It was found that musculoskeletal diseases often cause behavioural problems, affecting subjective disease perception, well-being, and social contacts with family and friends. The study results showed emotional improvement, leading to fewer limitations in performing daily activities.

Our own research confirms that pain symptoms decreased after the applied treatments.

Antczak-Komoterska et al. [16] showed that post-sanatorium treatment, there was an increase in responses indicating reduced pain symptoms. More participants could sit, stand, and sleep without lumbar pain, and pain during walking also decreased. The intensity of pain after sanatorium treatment was significantly reduced. Bolach et al. [17] found that a three-week spa physiotherapy programme reduced pain intensity in 65% of patients with degenerative lumbar spine changes, with pain levels decreasing by 0.85 on the VAS scale for women and 1.40 for men. Ratajczak et al. [18], in a study on 30 patients aged 41 to 62, examined the effects of laser and magnetic therapy combined with movement therapy for spinal degeneration, using the VAS scale. After 10–30 days of rehabilitation, significant improvements were observed, with women reporting a pre-treatment pain level of 7 on the VAS scale, and post-rehabilitation, the average VAS score for both women and men was 1.5. Wójcik et al. [19] examined the impact of comprehensive sanatorium therapy on lumbosacral spine pain syndrome in 31 patients. They observed a significant reduction in pain, with the average pain score dropping from 5 on the VAS scale at the start of treatment to 2 after completion.

Conclusions

Quality of life assessment is higher after sanatorium treatment than before treatment. Selected indicators of quality of life, such as physical, mental, and social functioning, improved after sanatorium treatment.

Implications for Nursing Practice

The findings from this study on patients with non-operatively treated lumbosacral spine pain syndrome demonstrate that sanatorium treatment positively affects subjective quality of life. The proposed sanatorium treatment yields favourable results, especially for conditions such as lumbosacral spine pain syndrome. These results underscore the importance of continued focus on this area, as subjective feedback from patients helps identify the major gaps, areas of achievement, and opportunities for ongoing improvement in the care and treatment system.

References

[1] Kiwerski J. Współczesne poglądy na rehabilitację. W: Kiwerski J. (Red.), *Rehabilitacja medyczna*. PZWL, Warszawa 2017;26–37.

[2] Wojcik G., Piskorz J., Ilzecka J., Bulikowski W. Effect of intervertebral disc disease on scoliosis in the lumbar spine. *Curr. Issues Pharm. Med. Sci*. 2014;27(3):155–158.

[3] Kovelenov A.Y. *Research of the efficiency of vibroacoustic therapy method in prophylaxis of influenza and other ARD*, Proceedings of the Fourth International Conference "Vibroacustic in Medicine", St. Petersburg 2006.

[4] Kapandji A.I., *Anatomia funkcjonalna stawów — kręgosłup, miednica, głowa*. Tom 3, Urban & Partner, Wrocław 2020.

[5] Sipko T., Gerke M. Wpływ leczenia uzdrowiskowego na parametry czynnościowe narządu ruchu i poziom bólu pacjentów z chorobą dyskową kręgosłupa lędźwiowego. *Fizjoterapia*. 2003;11(1):27–40.

[6] Sałacka A., Kotkowiak L., Hornowska I., Późniak J., Michoń P. Leczenie uzdrowiskowe — kogo kieruje lekarz rodzinny? *Fam Med Primary Care Rev*. 2009;11(3):481–484.

[7] Tylka J., Piotrowicz R. Kwestionariusz oceny jakości życia SF-36 — wersja polska. *Kardiol Pol*. 2009;67:1166–1169.

[8] Żołnierczyk-Zreda D., Wrześniewski K., Bugajska J., Jędryka-Góral A. *Polska wersja kwestionariusza SF-36v2 do badania jakości życia*. Centralny Instytut Ochrony Pracy — Państwowy Instytut Badawczy, Warszawa 2010.

[9] Tylka J. Formularz SF-36 — dokończenie dyskusji. *Kardiol Pol*. 2010;68(8):985.

[10] Bojczuk T., Przysada G., Strzępek Ł. Wpływ ćwiczeń leczniczych na wskaźniki jakości życia u pacjentów z bólem dolnego odcinka kręgosłupa. *Prz Med Uniw Rzesz*. 2010; 1:66–72.

[11] Depa A., Przysada G., Wolan A. Wykorzystanie kwestionariusza Oswestry do oceny stopnia upośledzenia aktywności funkcjonalnej u chorych z zespołem bólowym dolnego odcinka kręgosłupa. *Postępy Rehabilitacji*. 2010; 24(2):5–13.

[12] Klimaszewska K., Krajewska-Kułak E., Kondzior D., Kowalczuk K., Jankowiak B. Jakość życia pacjentów z zespołami bólowymi odcinka lędźwiowego kręgosłupa. *Probl Pielęg*. 2011;19(1):47–54.

[13] Śliwiński Z., Śliwa M., Starczyńska M., Kiebzak W. Quality of life in patients with lumbar spinal pain. *Fizjoter Pol*. 2014;14(2):26–39.

[14] Jurczak A., Szkup-Jabłońska M., Schneider-Matyka D. et al. Effect of sanatorium treatment on quality of life of patients with disorders of the musculoskeletal system. *Fam Med Prim Care Rev*. 2013;15(4):540–543.

[15] Wardeńska M., Perzyńska A., Kochanowicz M., Pabianek Ł., Trela E., Zukow W. Wpływ leczenia uzdrowiskowego na jakość życia osób starszych. *J Educ Health Sport*. 2017; 7(3):341–360.

[16] Antczak-Komoterska A., Filipska K., Haor B., Ślusarz R. Ocena wpływu leczenia sanatoryjnego na wyniki uzyskane w kwestionariuszu Oswestry w zakresie siedzenia, stania oraz spania. *Pielęg Neurol Neurochir*. 2018;7(2):70–74.

[17] Bolach B., Szafraniec R., Bolach E. Wpływ uzdrowiskowego usprawniania leczniczego na stan funkcjonalny pacjentów ze zmianami zwyrodnieniowymi dolnego odcinka kręgosłupa. W: Olszówka M., Niścior M. (Red.), *Innowacje w fizjoterapii*. Tom 2, Fundacja na rzecz promocji nauki i rozwoju TYGIEL, Lublin 2015;57–65.

[18] Ratajczak B., Ryfa R., Boerner E., Kuciel-Lewandowska J., Hawrylak A., Demidaś A. Ocena wpływu laseroterapii i magnetoterapii w połączeniu z kinezyterapią u pacjentów z chorobą zwyrodnieniową odcinka lędźwiowo-krzyżowego kręgosłupa. *Post Rehab*. 2011;2:13–18.

[19] Wójcik G., Skalska-Izdebska R., Kolbuszewska A., Szulc A. Wpływ kompleksowej terapii uzdrowiskowej na leczenie zespołu bólowego kręgosłupa lędźwiowo-krzyżowego. *J Educ Health Sport*. 2016;6(12):71–83.

Corresponding Author:

Lech Grzelak

Department of Neurosurgery, Specialist Municipal Hospital of Nicolaus Copernicus in Toruń, Poland
Batorego 17–19 street, 87-100 Toruń, Poland
e-mail: lechg7@gmail.com

Conflict of Interest: None
Funding: None
Author Contributions: Lech Grzelak[A, C, E–H], Agnieszka Kikosicka[A–C, E, F], Agnieszka Szajerska[G, H], Mateusz Szostak[G, H]

A — Concept and design of research, B — Collection and/or compilation of data, C — Analysis and interpretation of data, E — Writing an article, F — Search of the literature, G — Critical article analysis, H — Approval of the final version of the article

Received: 19.03.2024
Accepted: 29.04.2024