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.2024.13.1.1 JNNN 2024;13(1):3–8 **Original**

Frequency of Spinal Pain Symptoms Among Nursing Staff

Częstość występowania dolegliwości bólowych kręgosłupa wśród personelu pielęgniarskiego

Beata Dziedzic[1], **Aleksandra Archacka**[2], **Miłosz Marcysiak**[3], **Katarzyna Przylepa**[4], **Mariusz Wysokiński**[4], **Wiesław Fidecki**[4]

❶ Department of Development of Nursing, Social and Medical Sciences, Faculty of Health Sciences, Medical University of Warsaw, Poland

❷ Graduate, Medical University of Warsaw, Poland

❸ Department of Social Work, Faculty of Health and Social Sciences, National Academy of Applied Sciences. Ignacy Mościcki in Ciechanów, Poland

❹ Department of Basic Nursing and Medical Teaching, Chair of Development in Nursing, Faculty of Health Sciences, Medical University of Lublin, Poland

Abstract

Introduction. Individuals working in the nursing profession are particularly prone to experiencing spinal discomfort. This is due to the nature of their work, which involves lifting and carrying heavy loads, as well as working in constrained positions. Furthermore, nurses are also exposed to stress and excessive mental health strain. All of these factors can contribute to the occurrence of overloads and injuries to the spine.
Aim. The aim of the study was to analyze the frequency of spinal pain symptoms among nursing staff.
Material and Methods. The study group consisted of 155 individuals actively practicing the nursing profession. The Polish version of the Revised Oswestry Low Back Pain Disability Scale (OLBPDS-PL) and own questions were used to conduct the study.
Results. The frequency of spinal pain symptoms among nursing staff was 96.64%. 55.6% of the respondents reported mild disability, while 16.6% reported severe disability. A correlation was established between gender (p=0.026), the number of hours spent at work (p=0.049), BMI index (p=0.020), and the frequency of spinal pain symptoms. Age was borderline to statistically significant (0.050).
Conclusions. Spinal pain symptoms affect a significant portion of the studied group. Lower back pain worsens the daily functioning of nurses, primarily in terms of pain intensity, lifting objects, standing, and social life. Mild disability was observed in over half of the respondents with lower back pain symptoms. **(JNNN 2024;13(1):3–8)**
Key Words: lumbar region, lumbar spine, nursing, OLBPDS-PL, spinal pain

Streszczenie

Wstęp. Osoby wykonujące zawód pielęgniarki/pielęgniarza są w szczególności narażone na występowanie dolegliwości ze strony kręgosłupa. Wynika to z charakteru wykonywanej pracy, która wiąże się z koniecznością podnoszenia i przenoszenia ciężarów, a także pracą w pozycji wymuszonej. Ponadto pielęgniarki i pielęgniarze narażeni są na odczuwanie stresu i nadmierne przeciążenie zdrowia psychicznego. Wszystkie te czynniki mogą sprzyjać występowaniu przeciążeń oraz urazów ze strony kręgosłupa.
Cel. Celem pracy była analiza częstości występowania dolegliwości bólowych kręgosłupa wśród personelu pielęgniarskiego.
Materiał i metody. Grupę badaną stanowiło 155 osób czynnie wykonujących zawód pielęgniarki i pielęgniarza. Do przeprowadzenia badania wykorzystano kwestionariusz ang. Revised Oswestry Low Back Pain Disability Scale w wersji polskiej (OLBPDS-PL) oraz pytania własnego autorstwa.
Wyniki. Częstość występowania dolegliwości bólowych kręgosłupa wśród personelu pielęgniarskiego wynosiła 96,64%. Na niewielką niepełnosprawność wskazało 55,6% badanych, natomiast 16,6% na niepełnosprawność poważną.

Wykazano zależność pomiędzy płcią (p=0,026), liczbą godzin spędzonych w pracy (p=0,049), wskaźnikiem BMI (p=0,020) a częstością występowania dolegliwości bólowych kręgosłupa. Wiek był na pograniczu istotności statystycznej (0,050).

Wnioski. Dolegliwości bólowe kręgosłupa dotyczą znacznej ilości badanej grupy. Bóle dolnego odcinka kręgosłupa pogarszają funkcjonowanie pielęgniarzy i pielęgniarek w życiu codziennym, głównie w aspekcie intensywności bólu, podnoszenia przedmiotów, stania oraz życia towarzyskiego. U ponad połowy respondentów z dolegliwościami bólowymi dolnego odcinka kręgosłupa zaobserwowano niewielką niepełnosprawność. **(PNN 2024;13(1):3–8)**

Słowa kluczowe: odcinek lędźwiowy, kręgosłup lędźwiowy, pielęgniarstwo, OLBPDS-PL, ból kręgosłupa

Introduction

Musculoskeletal system disorders are the leading cause of chronic disability, work absenteeism, reduced productivity, and significantly impaired quality of life in humans [1,2]. Musculoskeletal disorders contribute to an increase in societal costs due to reduced worker efficiency and more frequent medical treatment [3]. It is estimated that approximately 1.71 billion people worldwide suffer from issues related to musculoskeletal disorders. The health problem of lower back pain is becoming a global issue [4]. Research results indicate that during their lifetime, 75% to 85% of people experience pain symptoms in this region. Most of them subside within a few weeks, but the pain can often recur and even become chronic [5]. It can also be a leading cause of early retirement [4]. Among other, more common types of complaints, back pain (43%) and pain in the shoulder girdle, neck, and upper limbs (41%) are also mentioned [3]. This issue also affects a younger population, where among individuals under 40 years old, as many as 70% have experienced lower back pain symptoms [6].

Individuals working in the nursing profession are particularly prone to experiencing spinal discomfort. This is due to the nature of their work, which involves frequent lifting and carrying of heavy loads in constrained positions, both while standing or sitting, often with a bent or twisted torso, for extended periods of time. Additionally, nursing staff also experience high levels of stress [7–9]. All these factors significantly contribute to the occurrence of strains and injuries [10]. Research on the frequency of spinal pain symptoms among nurses indicates that this issue occurs in 79% to 100% of nursing personnel [9,11–13]. However, the frequency of lower back pain symptoms among nurses varies from 35% to 80%, with as many as 70% of nursing staff experiencing lower back pain at least once a year [14]. In the study conducted by Konopko & Kowalewska, it was observed that nurses most commonly complained of pain symptoms in the lumbar-sacral region of the spine (51%) [12]. Among the operating room staff, back pain affected the lumbar region in 90% of cases, the sacral region in 38%, and the cervical region in 47% [11]. Furthermore, back pain is increasingly prevalent among nursing students and individuals who have recently obtained a nursing degree [7], where approximately 50% of students reported experiencing back pain [15]. This highlights a significant issue in this regard, emerging even among young individuals. Therefore, it is crucial for nurses to adhere to ergonomic principles in their work and comply with the applicable standards and directives. Each task should be planned and adapted to the environmental conditions. Nursing staff in their work must ensure patient safety but should also take care of their own health and working comfort [16].

The aim of this study was to analyze the frequency of spinal pain symptoms among nursing staff.

Material and Methods

This was a cross-sectional observational study. A convenient sample was utilized for the purposes of this research. The study was conducted from June to September 2022. The study group consisted of 155 individuals actively practicing the nursing profession for at least 12 months. The survey questionnaire in Polish was created using Google Forms. The survey was distributed to respondents electronically through social media. Participants provided their consent to participate in the study before proceeding. At any stage, individuals taking part in the research could withdraw from it without specifying a reason. The inclusion criteria for the study were employment as a nurse, actively practicing the nursing profession for at least 12 months, and providing informed consent to participate in the study. The collected data were confidential and used solely for the purposes of this research.

The survey questionnaire consisted of two parts. In the first part, the study group was characterized by determining sociodemographic variables, which included: gender, age, length of employment, workplace, average number of hours spent at work, and the calculation of the BMI index. We also assessed the frequency of spinal pain symptoms.

In the second part, the OLBPDS-PL questionnaire [17] was used, consisting of 10 single-choice statements related to lower back pain symptoms (lumbar and sacral

spine, as well as the coccyx) regarding pain intensity, self-care, lifting, walking, sitting, standing, sleeping, social life, traveling, and changes in pain intensity. After answering each question, respondents could receive up to 5 points, with a maximum total score of 50 points. The final OLBPDS-PL assessment based on scoring is as follows: 0–4 points indicate no disability; 5–14 points indicate mild disability; 15–24 points indicate moderate disability; 25–34 points indicate severe disability; 35–50 points indicate complete disability.

Statistical analysis was conducted using Statistica version 13.3. The results were subjected to hypothesis testing and statistical verification. Descriptive statistics were calculated to assess the significance of differences between variables. The following tests were applied: Mann–Whitney U test and Kruskal–Wallis H test. The significance level for statistical inference was set at $p<0.005$.

The study was approved by the Bioethics Committee at the Medical University of Warsaw (approval no AKBE/51/2023). All eligible participants were informed about objectives of the study. They were also assured of voluntary participation and confidentiality of information.

Results

The study was predominantly comprised of women (90.1%), and a statistically significant difference was also observed between women and men (p=0.026) regarding the level of pain symptoms. However, this result should be interpreted with caution due to the small proportion of men in the study, which accounted for 9.9%. The majority of participants in the study were in the age group of 41–50 years (43%). Statistical significance regarding the age of the participants was not demonstrated, but the result was borderline significant (p=0.050). The majority of the participants had work experience ranging from 21 to 30 years (49%). The largest number of individuals were employed in a hospital setting (53%). Most respondents (43%) spent ≤160 hours at work. The majority of participants (67.5%) had a normal body mass index (BMI), while 30.5% were overweight. Statistically significant differences were observed in terms of the BMI index (p=0.020), where individuals with overweight and obesity experienced more intense pain symptoms. Another statistically significant result pertained to the number of hours spent at work (p=0.049), where the most severe pain was reported by individuals who spent 161–200 hours at work (24.5%) (Table 1).

Table 1. Sociodemographic Variables and Results ODI (N=151)

Variable	N	%	M	SD	Z/p
Gender					
Women	136	90.1	8.97	5.78	Z=2.220 p=0.026
Men	15	9.9	5.86	4.55	
Age					
≤30 years	19	12.6	9.16	8.26	
31–40 years	27	17.9	6.33	4.26	Z=7.794 p=0.050
41–50 years	65	43.0	8.83	5.51	
≥51 years	40	26.5	9.72	5.30	
Years of Work Experience in the Profession					
≤10 years	24	15.9	8.58	7.48	
11–20 years	38	25.2	7.05	4.97	Z=7.244 p=0.064
21–30 years	74	49.0	9.05	5.25	
≥31 years	15	9.9	10.93	6.17	
Workplace					
Hospital Department	80	53.0	8.76	5.88	
Hospice	25	16.6	6.24	4.03	
Clinic	6	4.0	9.00	7.85	Z=6.942 p=0.138
Nursing Care Facility Care and Nursing Home Social Assistance Home	36	23.8	9.86	5.52	
Other, School	4	2.6	10.50	8.74	
Number of Hours Spent at Work					
≤160 hours	65	43.0	9.37	6.44	
161–200 hours	37	24.5	9.86	5.29	Z=7.839 p=0.049
201–250 hours	44	29.2	6.84	4.76	
≥250 hours	5	3.3	6.60	3.44	
BMI					
Underweight	0	0.0	–	–	
Normal Weight	102	67.5	8.12	5.37	Z=7.823 p=0.020
Overweight	46	30.5	9.11	5.88	
Obesity I, II, III Grade	3	2.0	20.33	2.52	

N — number of observations; % — percent; M — average; SD — standard deviation; Z — Mann–Whitney U test; p — statistical significance (p<0.05)

Among the surveyed group (N=155), 96.64% (N=151) of nurses declared experiencing lower back pain symptoms. Respondents reported that they most frequently experienced pain several times a month, accounting for 40% of the responses. Once a month, spinal pain symptoms occurred in 16.41% of respondents. Those who complained of this type of pain once a week accounted for 18.46%. Several times a week, spinal pain symptoms affected 13.33% of the respondents. Daily spinal pain was experienced by 2.56% of the participants.

Less frequently than once a month, spinal pain symptoms were reported by 9.23% of the respondents (Table 2).

Table 2. The frequency of experiencing lower back pain among the respondents (N=151)

Parameter	N	%
Every day	4	2.56
Several times a week	20	13.3
Once a week	28	18.46
Several times a month	60	40.0
Once a month	25	16.41
Less often than once a month	14	9.23

N — number of observations; % — percent

Analyzing the level of disability among the participants, 55.6% of them indicated mild disability (M=8.41; SD=2.47), while 16.6% reported severe disability (M=18.24; SD=2.49). Further details can be found in Table 3.

Table 3. The degree of disability according to the ODI (Oswestry Disability Index) (N=151)

Degree of disability	The total points according to the ODI questionnaire					
	N	%	M	SD	Min	Max
No disability (0–4)	41	27.2	2.78	1.28	0.0	4.0
Mild disability (5–14)	84	55.6	8.41	2.47	5.0	14.0
Moderate disability (15–24)	0	0.0	–	–	–	–
Severe disability (25–34)	25	16.6	18.24	2.49	15.0	23.0
Total disability (35–50)	1	0.7	31.00	–	31.0	31.0

N — number of observations; % — percent; M — average; SD — standard deviation; Min — minimum value; Max — maximum value

In terms of performing daily activities, the respondents encountered the most problems with the intensity of pain experienced (M=1.66; SD=1.27), changes in pain intensity (M=1.19; SD=0.88), as well as lifting objects (M=1.28; SD=1.20), standing (M=1.10; SD=0.78), and social life (M=1.00; SD=0.97). Detailed results are presented in Table 4.

Table 4. The level of individual categories according to the ODI (Oswestry Disability Index) (N=151)

Variable	M	SD	Min	Max
1	2	3	4	5
Pain intensity	1.66	1.27	0.00	5.00
Self-care	0.35	0.78	0.00	5.00
Lifting objects	1.28	1.20	0.00	5.00
Walking	0.05	0.32	0.00	3.00
Sitting	0.64	0.64	0.00	3.00
Standing	1.10	0.78	0.00	5.00
Sleeping	0.64	0.58	0.00	3,00
Social life	1.00	0.97	0.00	4.00
Traveling	0.74	0.76	0.00	4.00
Changes in pain intensity	1.19	0.88	0.00	4.00

M — average; SD — standard deviation; Min — minimum value; Max — maximum value

Discussion

Spinal pain symptoms constitute a significant social problem, particularly within the nursing profession [18]. Individuals in this profession are exposed to harmful and hazardous factors that can have an adverse impact on their health. Despite the existence of legal regulations in Poland aimed at governing working conditions, including gender-based distinctions and the nature of work, they are not always adhered to by those employed, and working conditions in many institutions significantly deviate from the established standards [19]. This is highlighted by the study conducted by Tworek, in which it was observed that only 35% of nurses were aware of the standards in accordance with Polish regulations concerning lifting and carrying heavy loads by women [18].

In our study, spinal pain was experienced by a significant majority of respondents (96.64%), with pain occurring most frequently several times a month (40%), once a month (16.41%), once a week (18.46%), and several times a week (13.33%). Terpiłowska presented higher results than those obtained in our study, where 100% of the participants confirmed experiencing spinal pain symptoms, with the most common complaints being once a week (36%) or several times a month (29%) [7]. However, according to reports by Stypułkowska et al., 79% of anesthetic nurses and instrument nurses complained of spinal pain symptoms, most commonly occurring daily or several times a week (41%) [11]. In Tworek's study, 62% of nurses experienced daily pain symptoms [18].

Meanwhile, every pain makes it difficult to perform basic human activities, but it also limits the fulfillment of work duties. This affects work efficiency and in the case of nurses, it can lead not only to a lack of job satisfaction but also to the provision of unsatisfactory medical services, both for the patient and the employer

[20]. Researchers from Serbia indicated that as many as 60% of individuals in their study had reduced work capacity due to lower back pain, and in the last 12 months, 93.95% of nurses suffered from these symptoms [21]. Among Italian nurses, the lifetime prevalence of lower back pain was 90.2%, in the last year it was 80%, in the last week it was 44.5%, and the risk of lower back pain mainly affected females [22]. Brusini provides valuable information in their report, pointing out several key risk factors for the occurrence of lower back pain, including insufficient training and the lack of adequate equipment to ensure the safety of nurses during patient care activities. In this review, it was shown that the annual incidence of lower back pain among nurses ranged from 17% to 63.7% [23].

According to the results obtained in our study, among the majority of nurses experiencing lower back pain symptoms (55.6%), we observed a slight disability, while in 16.6% of respondents, there was a significant disability. Lower results in terms of the average level of disability (8.33%) were obtained by Baumgart and others, while in that study, 65% of respondents were found to have slight disability [10]. According to reports from other researchers, 32% of nurses stated that they perceive their symptoms related to lower back pain as low disability pain, while 68% of respondents indicated that they perceive their symptoms as high disability pain [24].

In our study, women, older individuals, those with longer work experience, those working overtime, and those with a higher BMI were more likely to complain about lower back pain. Partially, our results are consistent with the meta-analysis conducted by Sun et al., where factors such as gender, work experience, and overweight were positively associated with the frequency of lower back pain [25]. Similar conclusions have been reached by other authors, where factors such as obesity [23,26] and age [23] were predictors of spinal pain. Undoubtedly, individuals with a higher BMI may experience greater strain on their spine, which can exacerbate pain-related issues in this part of the body. However, Mekonnen & Yenealem showed that women, those working overtime, and individuals over 35 years of age most frequently sought healthcare due to lower back pain. In our study, individuals aged ≥51 and ≤30 years reported more frequent complaints [24].

To reduce the risk of physical strain among healthcare workers, employers ought to provide essential equipment that should be used during patient transfers or lifting [16]. Nursing staff should be trained and familiarized with the instructions for the proper use of equipment and should use it according to its intended purpose [9]. In addition to knowing legal standards and implementing them, it is important to adopt the correct body position and posture while performing nursing tasks, which can significantly reduce the incidence of spinal problems [20]. It is important for nurses not to forget about maintaining their own physical condition and regularly engage in physical exercises. During their free time from work, nursing staff should prioritize relaxation and create suitable conditions for it [27].

Conclusions

Back pain symptoms affect a significant percentage of the studied group. Lower back pain had a negative impact on the functioning of the respondents, primarily due to the intensity of pain experienced, as well as in daily life during activities such as lifting objects, standing, and social activities. More than half of the respondents with lower back pain symptoms were observed to have mild disability, and nearly one-fifth of the respondents had significant disability. Lower back pain symptoms among nursing staff constitute a significant medical and social problem. Therefore, there is a need for preventive programs in this group aimed at improving ergonomics in the workplace.

Implications for Nursing Practice

In summary, in preventing the development of issues related to spine pain among nursing staff, it is of utmost importance to adhere to proper ergonomic practices at work, maintain the correct body posture during nursing tasks, and have the ability and willingness to use assistive equipment. Undoubtedly, the frequency of spinal pain issues is influenced by several other factors, such as perceived stress, individual susceptibility to spinal problems, healthy eating habits, and participation in physical activity in daily life. On the employers' side, providing appropriate equipment and adapting the workplace in accordance with the applicable regulations also play a significant role. Therefore, nursing staff should take care of their physical health by ensuring time for rest, relaxation, sleep, and fully adhering to ergonomic principles in their work.

References

[1] Briggs A.M., Woolf A.D., Dreinhöfer K. et al. Reducing the global burden of musculoskeletal conditions. *Bull World Health Organ*. 2018;96(5):366–368.
[2] Crawford J.O., Berkovic D., Erwin J. et al. Musculoskeletal health in the workplace. *Best Pract Res Clin Rheumatol*. 2020;34(5):101558.
[3] European Agency for Safety and Health at Work. *Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU*. Retrieved December 6, 2023, from https://osha.europa.eu/sites/default/files/Work-

related_MSDs_prevalence_costs_and_demographics_in_the_EU_report.pdf.
[4] Cieza A., Causey K., Kamenov K., Hanson S.W., Chatterji S., Vos T. Global estimates of the need for rehabilitation based on the Global Burden of Disease study 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2021;396(10267):2006–2017.
[5] Hammer E., Brooks M.A., Bartels C.M. Musculoskeletal Disorders. In Boulton M.L., Wallace R.B. (Eds.), *Maxcy-Rosenau-Last Public Health and Preventive Medicine* (16th ed.). McGraw Hill, 2022.
[6] Sobolewska P., Szyjka A., Szczepanowska-Wołowiec B. i wsp. Dolegliwości bólowe kręgosłupa w grupie pracowników biurowych. *Ostry Dyżur*. 2016;9(3):69–72.
[7] Terpiłowska J. Wpływ pracy zawodowej na występowanie zespołów bólowych kręgosłupa na przykładzie pielęgniarek pracujących w oddziałach szpitalnych. *Innow Pielęgniarstwie Nauk Zdr*. 2021;6(1):22–36.
[8] Naczelna Izba Pielęgniarek i Położnych. *Raport Naczelnej Rady Pielęgniarek i Położnych. Zabezpieczenie społeczeństwa polskiego w świadczenia pielęgniarek i położnych*. Naczelna Izba Pielęgniarek i Położnych, Warszawa 2017, https://nipip.pl/wp-content/uploads/2017/03/Raport_druk_2017.pdf [dostęp: 11.12.2023].
[9] Rozowski P. *Bezpieczna praca w zawodzie pielęgniarki*. Państwowa Inspekcja Pracy, 2019, https://www.pip.gov.pl/files/127/Dla-pracodawcow/339/bezpieczna-praca-w-zawodzie-pielegniarki.pdf [dostęp: 11.12.2023].
[10] Baumgart M., Radzimińska A., Szpinda M., Kurzyński P., Goch A., Zukow W. Dolegliwości bólowe kręgosłupa wśród personelu pielęgniarskiego. *J Educ Health Sport*. 2015;5(9):633–646.
[11] Stypułkowska K., Snarska K.K., Bowtruczuk J., Chorąży M. Występowanie dolegliwości bólowych kręgosłupa wśród personelu pielęgniarskiego bloku operacyjnego. W: Kowalczuk K., Krajewska-Kułak E. (Red.), *Wybrane problemy zdrowotne i zawodowe pracowników ochrony zdrowia*. Tom 1, Uniwersytet Medyczny w Białymstoku, Białystok 2019;42–82.
[12] Konopko K., Kowalewska B. Występowanie bólów kręgosłupa wśród pielęgniarek. W: Kowalczuk K., Krajewska-Kułak E. (Red.), *Wybrane problemy zdrowotne i zawodowe pracowników ochrony zdrowia*. Tom 1, Uniwersytet Medyczny w Białymstoku, Białystok 2019; 83–120.
[13] Mroczek B., Łubkowska W., Jarno W., Jaraczewska E., Mierzecki A. Occurrence and impact of back pain on the quality of life of healthcare workers. *Ann Agric Environ Med*. 2020;27(1):36–42.
[14] Van Hoof W., O'Sullivan K., O'Keeffe M., Verschueren S., O'Sullivan P., Dankaerts W. The efficacy of interventions for low back pain in nurses: A systematic review. *Int J Nurs Stud*. 2018;77:222–231.
[15] Yassi A. High prevalence of neck, shoulder and back pain among nursing graduates warrants preventive strategies during the degree and into working life. *Evid Based Nurs*. 2015;18(2):61.
[16] Augustyniuk K., Schneider-Matyka D., Owsianowska J. Komfort i wygoda pacjenta. W: Ślusarska B., Zarzycka D., Majda A. (Red.), *Podstawy pielęgniarstwa*. Tom 2, Wyd. Lekarskie PZWL, Warszawa 2017;259–300.
[17] *Kwestionariusz Revised Oswestry Low Back Pain Disability Scale w wersji polskiej (OLBPDS-PL)*, https://pacjent.gov.pl/sites/default/files/2019-09/ankieta.pdf [dostęp: 4.06.2022].
[18] Tworek K. Praca zawodowa a bóle kręgosłupa u pielęgniarek pracujących w szpitalach. *Wsp Piel Ochr Zdr*. 2017;6(1):19–22.
[19] Wyderka M.I., Niedzielska T. Ergonomia w pracy pielęgniarki. *Pielęg Pol*. 2016;2(60):165–169.
[20] Adamaszek M., Włoszczak-Szubzda A. Częstotliwość występowania bólu kręgosłupa u personelu medycznego. *Aspekty Zdrowia i Choroby*. 2018;3(1):133–151.
[21] Bozic A., Gajdobranski D., Brestovacki-Svitlica B. et al. The prevalence of low back pain among nurses in Serbia. *Work*. 2022;71(1):249–254.
[22] Latina R., Petruzzo A., Vignally P. et al. The prevalence of musculoskeletal disorders and low back pain among Italian nurses: An observational study. *Acta Biomed*. 2020;91(12-S):e2020003.
[23] Brusini A. Low back pain among nurses in Italy: a review. *G Ital Med Lav Ergon*. 2021;43(4):369–372.
[24] Mekonnen T.H., Yenealem D.G. Factors affecting healthcare utilization for low back pain among nurses in Gondar town, northwest Ethiopia, 2018: a cross-sectional study. *BMC Res Notes*. 2019;12(1):185.
[25] Sun W., Zhang H., Tang L., He Y., Tian S. The factors of non-specific chronic low back pain in nurses: A meta-analysis. *J Back Musculoskelet Rehabil*. 2021;34(3):343–353.
[26] Corrêa Pinto R.N., da Silva M.C., Caputo E.L., Domingues M.R. Low back pain prevalence and associated factors in nurses from Brazilian primary health units. *Work*. 2021;70(1):279–285.
[27] Ridan T. (Red.), *Atlas rehabilitacji ruchowej*. Tom 1, Wyd. Forum Media Polska, Poznań 2018.

Corresponding Author:
Beata Dziedzic
Department of Development of Nursing,
Social and Medical Sciences,
Faculty of Health Sciences,
Medical University of Warsaw
Żwirki i Wigury 61 street, 02-091 Warsaw, Poland
e-mail: beata.dziedzic@wum.edu.pl

Conflict of Interest: None
Funding: None
Author Contributions: Beata Dziedzic[A–H], Aleksandra Archacka[A–H], Miłosz Marcysiak[C, D, H], Katarzyna Przylepa[E–H], Mariusz Wysokiński[F–H], Wiesław Fidecki[F–H]

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

Received: 29.02.2024
Accepted: 15.03.2024