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The Occurrence of Pain in the Lumbar Spine in the Professional Group of Nurses

Występowanie dolegliwości bólowych w odcinku lędźwiowym kręgosłupa w grupie zawodowej pielęgniarek

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Abstract

Introduction. Back pain syndromes affect people inhabiting every latitude of the globe. They are more or less intense diseases of affluence affecting many professional groups, including nurses.

Aim. The aim of the study was to assess the influence of selected risk factors on the occurrence of back pain in the lumbar region among nurses from the Specialist City Hospital in Toruń.

Material and Methods. The research was carried out at the Specialist City Hospital (SCH) in Toruń after obtaining the consent of the Bioethics Committee and the hospital management. The study included a group of 165 nurses employed in all organizational units of the hospital. The work uses the method of a diagnostic survey, and two research tools — the original survey and the Oswestry questionnaire.

Results. Among the analysed demographic factors, only the age and seniority of the respondents predispose to the occurrence of back pain syndrome ($p < 0.05$). The BMI index also turned out to be statistically significant ($p < 0.05$). The statistical relationship ($p > 0.05$) was not confirmed among other variables such as: gender, work system, physical load, smoking and past spine injuries.

Conclusions. Due to the increase in the average age and seniority among nurses, increasing back pain will become their leading health problems. The broadly understood health education in this professional group should be considered in order to reduce the share of overweight and obesity as factors predisposing to back pain syndrome. (JNNS 2020;9(2):65–70)

Key Words: spinal pain syndromes, nurses, measurement

Streszczenie

Wstęp. Zespoły bólowe kręgosłupa dotyczą ludzi zamieszkujących każdą szerokość geograficzną globu. Z mniejszą lub większą intensywnością są chorobami cywilizacyjnymi dotyczącymi wielu grup zawodowych w tym pielęgniarek.

Cel. Celem pracy była ocena wpływu wybranych czynników ryzyka na występowanie bólu kręgosłupa w odcinku lędźwiowym wśród pielęgniarek i pielęgniarzy Specjalistycznego Szpitala Miejskiego w Toruniu.

Materiał i metody. Badania przeprowadzono w Specjalistycznym Szpitalu Miejskim (SSM) w Toruniu po wcześniejszym uzyskaniu zgody Komisji Bioetycznej oraz dyrekcji szpitala. Badaniami objęto grupę 165 pielęgniarek i pielęgniarzy zatrudnionych we wszystkich jednostkach organizacyjnych szpitala. W pracy wykorzystano metodę sondaży diagnostycznego, oraz zastosowano dwa narzędzia badawcze — autorską Ankietę oraz kwestionariusz Oswestry.

Wyniki. Spośród analizowanych czynników demograficznych tylko wiek i staż pracy respondentów predysponują do występowania zespołu bólowego kręgosłupa ($p < 0,05$). Istotny statystycznie okazał się także współczynnik BMI ($p < 0,05$). Zależności statystycznej ($p > 0,05$) nie potwierdzono wśród pozostałych zmiennych takich jak: płeć, system pracy, obciążenie fizyczne, palenie papierosów oraz urazy kręgosłupa w przeszłości.

Wnioski. W związku ze wzrostem średniej wieku i stażu wśród pielęgniarek i pielęgniarzy, nasilające się dolegliwości bólowe kręgosłupa staną się ich wiodącymi problemami zdrowotnymi. Należy rozważyć szeroko rozumianą edukację zdrowotną w tej grupie zawodowej, by zmniejszyć udział nadwagi i otyłości jako czynników predysponujących do zespołu bólowego kręgosłupa. (PNN 2020;9(2):65–70)

Słowa kluczowe: zespoły bólowe kręgosłupa, pielęgniarki, ocena

Introduction

Over the centuries, back pain syndromes (BPS) have become one of the basic disease entities predisposing to medical care. Along with the development of civilization, the problem increased to the rank of a civilization disease, significantly reducing human physical activity in various fields of life [1].

According to the literature, 75–85% of the population experiences back pain at different stages of their lives [2,3]. In the USA, it is estimated that the average annual incidence of backache is 15–25%, while in Europe data indicate that the problem is twice as large. Annual incidence of back pain in Europe ranges from 25–45% [4]. The incidence of the back pain syndrome increases after the age of thirty and reaches its maximum at the age of fifty-five to sixty-four [3]. The frequency of the syndrome is comparable in women and men, and its more frequent occurrence in women with age [3]. The ailments related to the dysfunction of the spine have become so much stronger in the societies of many countries that they deserve the name of civilization diseases [5], which significantly reduce the budgets of these countries. The United States spends about 100 billion dollars annually on the diagnosis and treatment of back pain [6], more than 50% of the cost of spine diseases in the world is related to indirect social costs such as sickness absenteeism, treatment or disability [4]. This proves that it is a global problem, both medical and economic. After hypertension, degenerative diseases of the spine and joints in Poland have become the most common chronic diseases treated in the practice of a family doctor [7].

Research conducted in Poland has shown that as many as 72% of Poles under the age of 40 have had an incident of back pain in the lumbar region at least once. Pain lasts about a week in 45% of Poles, and in about 41% it lasted about a month, in the remaining 6% the pain lasted about two months. The pessimistic result was the fact that in as many as 68% of respondents the complaints returned within a year [7]. This study confirms that the evidence supporting the fact that nonspecific back pain varies in adults with relapses, periods of remission and may eventually become chronic [4,8]. International epidemiological studies have shown that the “one in five” rule has been confirmed among patients who complain of backache and are treated by a healthcare practitioner [4].

Pain in the lumbar spine has a multifactorial background and does not have a uniform aetiology. Symptoms reported by patients are determined by the individual characteristics of individuals, their working conditions of lifestyle [4]. Risk factors can be subordinated to several domains such as: individual factors, morphological factors, general psychosocial factors,

occupational physical factors and occupational psychological factors [4].

In the 21st century, a nurse, despite theoretical preparation for work, significant expansion of competences, equipping workplaces with specialist equipment, and employing care staff, still performs heavy physical work [9]. The physical load mainly concerns such activities as nursing and hygienic procedures or transporting patients [9]. During these activities, it is not uncommon to stay in a forced position and overload the spine, which, according to the research [4,6] have an impact on the occurrence of BPS in the lumbosacral spine.

Undoubtedly, gender and age are factors contributing to the occurrence of BPS in the professional group of nurses. Feminization of the profession (in 2016 only 2% of nurses are men) [10], and the aging professional group, according to the NIPiP data in 2019, the average age of nurses is 52 years [9] favour the above disease. The high average age of a nurse in Poland is also a high risk of comorbidities (including obesity).

The literature describes the multifaceted nature of the problem that is constantly evolving. New clinical trials are focusing on the causes, predisposing factors, and treatment methods. The subject is also no stranger to the professional group of nurses. Working with various physical loads, often in a forced position, multi-shift, causes the back problems among nurses to become more and more common.

The aim of the study was to assess the impact of selected risk factors (gender, age, work experience, BMI, work system, physical load, smoking, past injuries of the spine) on the occurrence of back pain in the lumbar region among nurses at the Specialist Municipal Hospital in Toruń.

Material and Methods

The research was carried out at the Specialist City Hospital (SCH) in Toruń after obtaining the consent of the Bioethics Committee and the hospital management. The study included a group of 165 employed in all organizational units of the hospital. The respondents were informed that participation in the research was anonymous, free and voluntary. The research was conducted at the turn of 2019/2020.

The study used the method of a diagnostic survey, and two research tools were applied — the original Survey and the Oswestry questionnaire [11,12], which were distributed to the places designated in individual organizational units from which they were collected after a month. The Oswestry questionnaire included questions about the severity of back pain when performing various

activities of daily living. You could get from 0 to 5 points for the answer. The ODI factor division was used during the analysis, including the degree of disability: 0–20% — No disability, 21–40% — Minor disability, 41–60% — Moderate disability, 61–80% — Severe disability, 81–100% — Total disability. The characteristics of the study group are presented in Table 1 and 2.

The research was developed in Excel and STATISTICA. The U Mann Whitney (U) and Kruskal–Wallis (H) tests were used for statistical analyses. The results of the statistical analysis were performed at the significance level of $p=0.05$.

Table 1. Characteristics of the study group

Variable	N	%
Gender		
Woman	157	95.0
Man	8	5.0
Age		
Up to 25 years	13	8.0
26–30 years	22	13.0
31–40 years	15	9.0
41–50 years	57	35.0
50 years and more	58	35.0
Work experience in the profession		
Up to 5 years	31	19.0
6–10 years	17	10.0
11–20 years	13	8.0
21 years and more	104	63.0
Work system		
One-shift	40	24.0
Two-shift	125	76.0
Physical load		
Yes	138	84.0
No	27	16.0
BMI		
Up to 24.5	72	44.0
24.6–30.0	75	45.0
31.0 and more	18	11.0
Past spine injury		
Yes	27	16.0
No	138	84.0
Do you smoke		
Yes	27	16.0
No	138	84.0

Table 2. Characteristics of the studied group — the result of the ODI coefficient

Result of the ODI coefficient	N	Cumulative N	%	Cumulative %
0%	31	31	19	19
2%	5	36	3	22
4%	6	42	4	25
6%	6	48	4	29
8%	12	60	7	36
10%	13	73	8	44
12%	15	88	9	53
14%	11	99	7	60
16%	15	114	9	69
18%	7	121	4	73
20%	11	132	7	80
22%	6	138	4	84
24%	6	144	4	87
26%	6	150	4	91
28%	2	152	1	92
30%	3	155	2	94
32%	2	157	1	95
34%	5	162	3	98
36%	1	163	1	99
42%	1	164	1	99
46%	1	165	1	100

Results

The conducted research has shown (Table 3) that there are no differences between gender and the occurrence of back problems.

In terms of age, five groups were distinguished: up to 25 years of age, from 26 to 30 years of age, from 31 to 40 years of age, from 41 to 50 years of age and over 50 years of age. These sets were represented by, respectively: 13, 22, 15, 57, 58 people. The result of the Kruskal–Wallis test $H=24.7$, with a p -value of less than 0.05, indicates the significance of differences at least between the two groups. From the multiple comparison test, it can be concluded that there is a statistically significant difference ($p<0.05$) between the groups over 50 years of age and up to 25 years of age and groups over 50 years of age and 26–30 years of age (Figure 1).

When analysing the influence of seniority on the occurrence of pain, the sample representing nurses was divided into four categories of work experience: up to 5 years, from 6 to 10 years, from 11 to 20 years and over 20 years. The last group included the most, 104 of 165 surveyed people. The study showed statistically

Table 3. Selected demographic factors and ODI

Variable	N	Test	p
Gender*			
Woman	157	487.5	0.2850
Man	8		
Age**			
Up to 25 years	13	24.70	0.0001_fig. 1
26–30	22		
31–40	15		
41–50	57		
50 years and more	58		
Work experience**			
Up to 5 years	31	27.06	0.0000_fig. 2
6–10 years	17		
11–20 years	13		
20 years and more	104		
Work system*			
Two-shift	125	241.0	0.752
One-shift	40		
Physical load*			
Yes	27	150.0	0.111
No	138		
Smoking*			
Yes	27	183.5	0.904
No	138		
BMI**			
Up to 24.5	72	10.85	0.0044_fig. 3
24.6–30.0	75		
31.0 and more	18		
Past spine injuries*			
Yes	27	158.0	0.226
No	138		

ODI — Oswestry Disability Index, BMI — Body Mass Index, *Mann–Whitney U test, **Kruskal–Wallis test

significant ($p < 0.05$) differences between at least two groups — between people over 20 years of working experience and those working for up to 5 years, and the fraction from 11 to 20 years and people working under 5 years (Figure 2).

By analysing demographic factors, it was checked whether the work system in which nurses work had an impact on their ailments originating from back pain. Most of the surveyed nurses worked in a two-shift system, as there were three times more of them than in the one-shift system. The obtained test result with its p-value equal to approximately 0.75 indicates that it is not statistically significant and a hypothesis should be

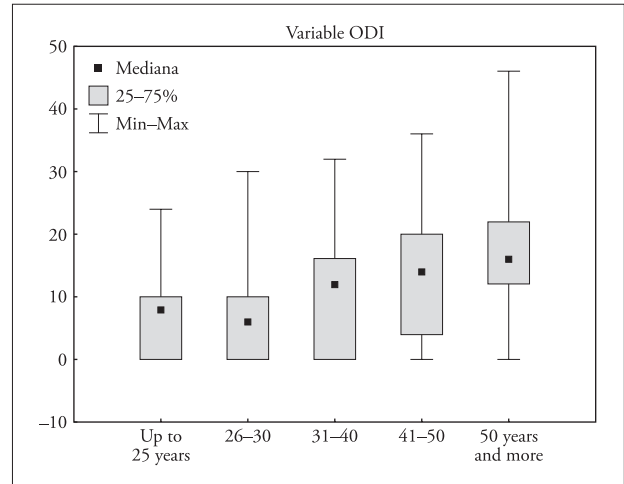


Figure 1. Age and ODI

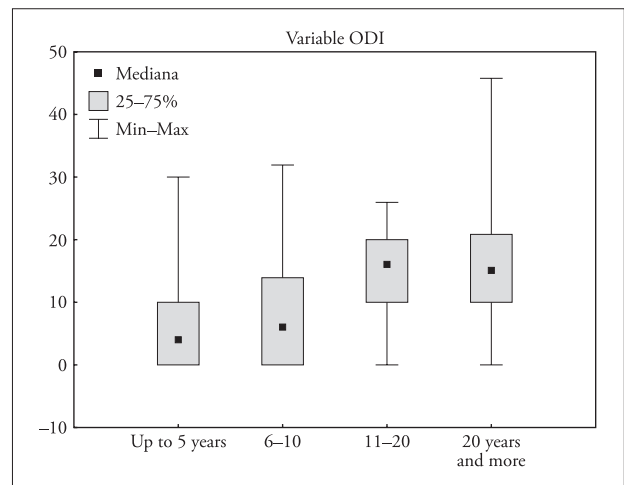


Figure 2. Work experience in the profession and ODI

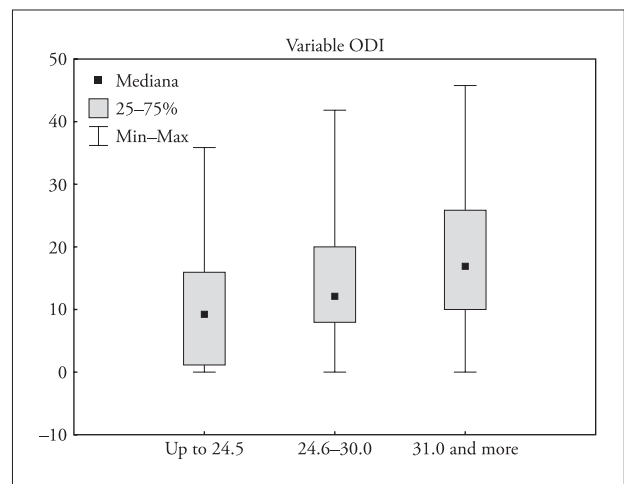


Figure 3. BMI and ODI

assumed that there are no differences between the studied groups determined by the work mode.

The physical load to which the participants of the study are exposed and whether it has an impact on the occurrence of back pain was also analysed. Based on the collected data, it was determined that 27 respondents considered their work to be physically demanding, while

the remaining part (138 people) did not report such a tendency. Based on statistical estimation with a significance level of 0.05, no difference can be found between the studied groups.

Another research problem was to find out whether smoking cigarettes may have an impact on the spinal discomfort that occurs during everyday activities. The data included 138 non-smokers and 27 smokers. With a probability level of 0.05, the impact of smoking on the problem of everyday activities caused by back pain cannot be found.

The influence of body weight, and more precisely the BMI value, on the occurrence of back pain was also analysed. For this purpose, three groups of respondents were designated. In the designated groups there was a similar number of people with BMI to 24.5 (72 people) and from 24.6 to 30 (75 people) and 18 people with BMI over 30. From the analysis of the Kruskal–Wallis test, the result $H=10.86$, $p=0.0044$ ($p<0.05$) indicates the significance of differences between at least two groups (Figure 3) — between the group of people with BMI over 30 and BMI up to 24.5. Moreover, the difference between the BMI 24.6 — 30 and the group up to 24.5 were identified with $p=0.055$, which means the result is very close to statistical significance.

A past spine injury may also have a significant impact on the discomfort associated with back pain. 27 people who had previously suffered a spine injury participated in the study, while the remaining 138 people did not. Statistical estimation with a significance level of 0.05 showed no significant differences.

Discussion

The aim of the study was to identify risk factors that may contribute to the occurrence of back pain in the lumbar region of male and female nurses.

The research carried out by researchers from the Medical University of Warsaw, analysing the occurrence of lumbosacral discopathy in the professional group of nurses, obtained results with own research. In the group of 100 randomly selected nurses surveyed, it was found that for 29 people with work experience over 21 years and more ($p<0.05$), lumbosacral discopathy is a health problem. Common symptoms of spinal disorders in the study group were: numbness of the limb, pain radiating along the buttock, pain radiating to the knee, or back pain [10].

The Cracow centre also analysed back pain in the professional group of nurses [13]. The study involved 200 randomly selected nurses from the Lesser Poland conservative and surgical wards. The presence of back pain was reported by as many as 92.9% of respondents. The mean age of reporting spinal pain was 38.4 years.

The authors of the study were concerned about the fact that the reaction to overload with manual work in nurses had already appeared in the group of very young people (before 26 years of age). The research of the centre in Lesser Poland showed a tendency to increase the symptoms with the seniority and age of the respondents.

The employees and students of the Medical University in Lublin also undertook the research on the subject of back pain in professionally active nurses [14]. The study covered 101 nurses working in the Independent Public Healthcare Centre in Kraśnik. The average age of the respondents was 43.8 years, and the vast majority of 97.33% were women. In the study group, over 80% of respondents showed the existence of a back pain problem in their lives. Significant pain in the lumbosacral segment appeared in 55.45% of the respondents.

Research carried out in the Provincial Hospital for Nervous and Mentally III in Świecie in a group of 50 respondents also showed a statistical relationship between seniority and age in the nursing profession, and the incidence of BPS [5]. All respondents stated that they experienced back pain, and more than half (30 people) complained of pain in the lumbar region.

Another centre analysing the occurrence of BPS among nurses was the Łódź centre. The study involved 123 randomly selected nurses employed in hospitals in Łódź. In the study group, all respondents experienced back pain, and as many as 61.8% suffered from it everyday [15]. In the study group, 86.2% of respondents complained of pain in the sacrolumbar region, and the statistical analysis showed a significant correlation between the occurrence of back pain in the nursing profession and work experience $p=0.005$.

The research conducted by the employees of the Nicolaus Copernicus University in Toruń showed that the majority of the respondents were women — 71, which constituted 93.42%. Among the respondents, as many as 98.7% complained of back pain. Pain located in the sacrolumbar section concerned 80.26% of respondents. The main determinants causing pain were seniority and additional activities outside of work in the ward [16].

Researchers from Rzeszów also observed an increased BMI as an important factor for the occurrence of BPS among medical workers. The research covered 170 people (nurses, doctors, physiotherapists), employees of Rzeszów departments and specialist clinics. In the study group, it was observed that overweight nurses were more likely to suffer from disability related to BPS. There was no such relationship between the final value of the Oswestry questionnaire and obesity or its absence in the group of physicians and physiotherapists [17].

Unfortunately, the data from the sample did not allow to detect the difference in the ODI index between people who exercise regularly and those who do not. Certainly, it would be more rational to use corrective

exercises. On the other hand, the applied criterion of self-efficiency assessment allowed to distinguish certain fractions characterized by a lower ODI index. People who define their condition as very good definitely have less back pain complaints. On the contrary, people with sufficient and poor physical fitness often have back problems when performing daily activities.

Conclusions

1. Due to the increase in the average age and seniority among male and female nurses, increasing back pain will become their leading health problems. Overweight is an important factor influencing the occurrence of pain.
2. Gender, work system, physical load, smoking and past injuries of the spine do not significantly affect the occurrence of back pain in the lumbar region.

Implications for Nursing Practice

The conducted research indicates the need for broadly understood health education in the professional group of nurses and midwives in order to reduce the share of overweight and obesity as one of the factors predisposing to the occurrence of the back pain syndrome. Taking care of your general health and broadly understood prophylaxis will reduce the risk of ailments related to the spine.

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