

LUMBAR-SACRAL DISCOPATHY – NURSES’ HEALTH PROBLEM

DYSKOPATIA ŁĘDŹWIOWO-KRZYŻOWA – PROBLEM ZDROWOTNY PIEŁĘGNIAREK

Zofia Sienkiewicz¹, Beata Dąbrowska², Grażyna Wójcik¹, Józefa Czarnecka³, Ewa Kobos¹, Jacek Imiela¹

¹ Department of Social Nursing, Medical University of Warsaw

² Nursing Graduate of Medical University of Warsaw

³ Department of Rudiments of Nursing, Medical University of Warsaw

ABSTRACT

Introduction. Intensification of lumbar-sacral discopathy symptoms to a great extent results from maladjustment of the workstation in relation to ergonomic guidelines, working in a forced body position and hard physical labour.

Aim. The analysis lumbar-sacral discopathy development, work-related nurses’ health problem.

Material and methods. The survey was performed with a diagnostic poll method among 100 randomly selected nurses. Participation in the survey was voluntary and anonymous. The questionnaire consisted of 20 questions and the survey was carried out in 2013.

Results. Lumbar-sacral discopathy is a health problem for N=29 respondents with job tenure of 21 years and more ($p<0,05$). Limb numbness, pain radiating down to the buttock and the knee, spine pain are frequent problems. The forced body position and/or sudden change in the body position and hard physical labour may lead to occurrence of lumbar-sacral discopathy.

Conclusions. The lumbar spine pain problem in the occupational group of nurses is of great significance. Nurses with longer job tenure are more susceptible to discopathy.

KEYWORDS: nursing, spine, health risks, lumbar-sacral discopathy.

STRESZCZENIE

Wstęp. Na pogłębianie się objawów dyskopatii krzyżowo-łędźwiowej duży wpływ ma niedostosowanie stanowiska pracy do zasad ergonomii, wykonywanie pracy w wymuszonej pozycji ciała oraz ciężka praca fizyczna.

Cel. Analiza powstawania dyskopatii łędźwiowo-krzyżowej, problemu zdrowotnego pielęgniarek związanego z wykonywaną pracą.

Materiał i metody. Badania przeprowadzono metodą sondażu diagnostycznego wśród 100 losowo wybranych pielęgniarek, udział w badaniu był dobrowolny i anonimowy. Kwestionariusz ankiety składał się z 20 pytań, badania przeprowadzono w 2013 roku.

Wyniki. Dyskopatia krzyżowo-łędźwiowa jest problemem zdrowotnym dla N=29 badanych ze stażem pracy 21 lat i powyżej ($p<0,05$). Częstymi problemami są: drętwienie kończyn, ból promieniujący wzdłuż pośladka, ból promieniujący do kolana, ból kręgosłupa. Na występowanie dyskopatii ma wpływ wymuszona pozycja ciała i/lub nagła zmiana pozycji ciała oraz ciężka praca fizyczna.

Wnioski. Problem dolegliwości bólowych kręgosłupa łędźwiowego w grupie zawodowej pielęgniarek jest bardzo istotny. Personel z wieloletnim stażem pracy częściej jest narażony na występowanie dyskopatii.

SŁOWA KLUCZOWE: pielęgniarstwo, kręgosłup, zagrożenia zdrowia, dyskopatia łędźwiowo-krzyżowa.

Introduction

Pain in the area of the spine is a serious, both social and clinical problem. It affects mainly young professionally active people. It is caused due to spine overloading during daily activities and performance of professional activities [1]. Areas affected can be neck, thoracic or lumbar-sacral regions [2]. The cause is the fracture of the fibrous ring of intervertebral disc, which results in a dislocation of the pulposus nucleus into the fracture and, consequently, in the development of herniation or protuberance [3].

Among various occupational groups nurses are most susceptible to lumbar-sacral spine diseases. Degenera-

tive changes are the effect of injuries associated with intervertebral ring overloading, which may be related to the nature of performed job [4]. The workstation of majority of nurses is related to tasks involving manual moving, carrying or conveying patients and heavy medical equipment [5, 6]. Adverse work conditions (workstation maladjustment in relation to ergonomic rules), working time system and working in a forced body position [6–8] contribute to worsening of medical symptoms.

Aim

The analysis of lumbar-sacral discopathy development, nurses’ health problem related to work performance.

Research material

The survey was carried out among 100 randomly selected nurses employed in health care units in the Mazovian Voivodeship. The largest proportion of respondents were persons within the age range of 31–40 (37%) and 41–50 (32%), 18% of the respondents were 51 or more years old. The least numerous group included nurses in the age range of 21–30 (13%). The majority of the surveyed persons performed the profession for 21 and more years (42%), 63% nurses worked in the shift system. The workload of the surveyed team was high for 58% of the respondents. The permissible lifting weight for women (up to 12 kg) are known to 40%. The majority of nurses feel lumbar spine pain after the day shift (62%).

In the survey a diagnostic poll method was used with authors' questionnaire consisting of 20 questions as an instrument. The survey was anonymous. All the respondents expressed their consent to participate in the survey, which was carried out from February to March 2013.

In order to check significance of relations between the analyzed variables, the statistical analysis was performed using the chi-square test.

Table 1. Number of patients in the surveyed nurses' ward

Number of patients in the ward	Frequency	%	Significant percent	Cumulative percent
1 to 15	13	13.0	13.0	13.0
16 to 30	29	29.0	29.0	42.0
31 to 40	38	38.0	38.0	80.0
above 40	20	20.0	20.0	100.0
total	100	100.0	100.0	

The highest number of nurses (38%) are employed in the ward, in which the number of patients amounts from 31 to 40 and 29% of respondents work in a ward with 16 to 30 beds. In wards with more than 40 patients 20% of respondents are employed. Of the survey group 13% of employees work in wards with 1 to 15 beds.

Table 2. Awareness of permissible maximum lifting weights for women among nurses

Permissible lifting maximum weights	Frequency	%	Significant percent	Cumulative percent
up to 12 kg	40	40.0	40.0	40.0
up to 20 kg	55	55.0	55.0	95.0
up to 30 kg	4	4.0	4.0	99.0
I do not know	1	1.0	1.0	100.0
total	100	100.0	100.0	

In opinion of 55% of surveyed nurses the permissible maximum lifting weight for women amounts to 20 kg. The right answer (12 kg) was indicated by 40% and 4% of respondents considered 30 kg as standard.

Table 3. Lumbar-sacral discopathy as nurses' health problem vs job tenure

Lumbar-sacral discopathy, nurses health problem	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 years and longer	
yes	5	3	19	29	56
no	3	0	5	9	17
sometimes	6	2	15	4	27
total	14	5	39	42	100

chi2 (6,N=100) = 12.85; p<0.05

Lumbar-sacral discopathy is a health problem of N=83 surveyed nurses (yes n=56, sometimes n=27), most frequently it affects persons with job tenure of 21 and more years (n=29); next is a group with job tenure of 14–21 years (n=34), in which discopathy (yes n=19, sometimes n=15) is a health problem. The significant test result allows to reject the null hypothesis and accept an alternative hypothesis about a significant relation between analysed variables. The nurses with longer job tenure (21 years and more) are much more susceptible to lumbar-sacral discopathy than those with job tenure up to 14 years (p<0.05).

Table 4. Frequency of pain sensation vs job tenure of nurses

Sensation of pain in lumbar-sacral region	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 year and more	
after day shift	11	4	30	17	62
after night shift	1	1	3	2	7
I do not sense pain	1	0	5	18	24
after morning shift	1	0	1	5	7
total	14	5	39	42	100

chi2 (9,N=100) = 20.957; p<0.05

Spine pain is most frequently felt by nurses after day shifts (N=62). Regardless of the shift, persons performing the job for 21 and more years (n=42) feel pain in the spine area. Analysis of the shift type and job tenure showed a significant statistical relation (p<0.05): nurses who perform the profession for 14–21 years feel pain after a day shift much more frequently than persons who worked shorter or longer than that.

Mentioned ailments, regardless of the shift type, to the least extent are experienced by nurses who have

worked 7–14 years; of this group each twentieth respondent reports the symptoms. Every fourteenth respondent do not experience spine pain in lumbar-sacral region.

Table 5. Limb numbness as an symptom related to discopathy vs job tenure

Limb numbness	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 years and more	
very often	6	1	15	32	54
often	7	3	14	9	33
sometimes	1	0	10	1	12
occasionally	0	1	0	0	1
never	0	0	0	0	0
total	14	5	39	42	100

chi2 (12,N=100) = 27.549; p<0.05.

Limb numbness as a symptom related to discopathy is most frequently reported by nurses N=87 (very often n=54 and often n=33), of which respondents with job tenure 21 and more years (n=32) report this symptom as occurring very often.

Limb numbness as a serious problem occurs in persons with job tenure of 14–21 years and 21 or more years, which is confirmed by a significant statistical difference level p<0.05 between analyzed variables.

Table 6. Pain radiating down a buttock as a symptom related to discopathy vs job tenure

Pain radiating down a buttock	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 years and more	
very often	4	2	9	25	40
often	8	2	20	10	40
sometimes	1	1	2	5	9
occasionally	0	0	8	2	10
never	1	0	0	0	1
total	14	5	39	42	100

chi2 (15,N=100) = 33.284; p<0.05

Pain radiating down the buttock is experienced by N=80 respondents (very often n=40 and often n=40). The most numerous group with job tenure of 21 and more years experiences this kind of pain very often (n=25) and often (n=10) and persons who have worked 14–21 years feel it often (n=20).

A significant statistical difference level p<0.05 was observed between the analyzed variables.

Table 7. Pain radiating down to the knee as a symptom related to discopathy vs job tenure

Pain radiating down to the knee	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 years and more	
very often	2	0	4	13	19
often	3	4	15	11	33
sometimes	7	1	9	14	31
occasionally	0	0	10	1	11
never	2	0	1	3	6
total	14	5	39	42	100

chi2 (15,N=100) = 28.364; p<0.05

The respondents to various extent associate knee radiating pain with lumbar-sacral discopathy – mostly persons with job tenure of 21 and more years (occasionally n=14, very often n=13 and often n=11) and persons who have worked 14 to 21 years (often n=15 and occasionally n=10, sometimes n=9).

The statistical significant difference level p<0.05 was observed between analyzed variables – with the increase of job tenure value probability of associating radiating knee pain with lumbar-sacral discopathy increases.

Table 8. Spine pain associated with bending as a symptom related to discopathy vs job tenure

Spine pain associated with bending	Job tenure				total
	0–7 years	7–14 years	14–21 years	21 years and more	
very often	7	3	23	25	58
often	6	2	7	15	30
sometimes	1	0	2	2	5
occasionally	0	0	7	0	7
never	0	0	0	0	0
total	14	5	39	42	100

chi2 (15,N=100) = 29.530; p<0.05

Spine pain associated with bending as a symptom related to discopathy is identified by N=88 nurses (very often n=58 and often n=30), mostly the nurses who have worked 21 and more years (n=25) and 14 to 21 years (n=23). Much more frequently often (n=15) spine pain associated with bending is reported by nurses who have worked 21 and more years than by the persons with job tenure of 14–21 years (n=7). The statistical significant difference level p<0.05 was observed between analyzed variables.

Table 9. Factors that may have impact on occurrence of discopathy

Analyzed factors	Very often	Often	Sometimes	Occasionally	Never	I do not know
Cigarette smoking	8	6	13	28	28	17
Stress	12	13	21	28	14	12
Undernutrition	9	19	28	34	2	8
Osteoporosis	45	39	12	3	0	1
Hard physical labour	70	28	2	0	0	0
Age	43	37	17	2	1	0
Sport practicing, e.g. weightlifting, martial arts	27	47	21	4	1	0
Obesity	52	45	3	0	0	0
Forced body position	71	28	1	0	0	0
Excessive physical strain	70	29	1	0	0	0
Excessive overloading of the musculoskeletal system	49	42	8	1	0	0
Injury	53	29	17	1	0	0
Sudden change of body position	70	24	6	0	0	0

Among the analyzed factors, that may have impact on discopathy occurrence, the following were indicated as main factors: the forced body position (71%), excessive physical strain, the sudden change of body position and hard physical labour (70%), injury (53%) and obesity (52%). Other frequently mentioned factors were: practicing sports like weightlifting or martial arts (47%), obesity (44%) and excessive overloading of musculoskeletal system (very often – 49% and often – 42%).

Surveyed nurses with lumbar-sacral discopathy do not associate or do not know whether to associate cigarette smoking (45%), stress (26%), undernutrition (10%) with discopathy occurrence or associates them sometimes and occasionally.

Discussion

Spine loading during performance of professional tasks poses a risk to nursing staff health [6], may lead to lumbar-sacral discopathy and related pain disorders, which are so common that they become one of main social, medical and economical problems and are classified as civilization diseases. One of various occupational groups susceptible to discopathy occurrence includes nurses and spine pain problem in this occupational group is very significant [2, 5]. The spine lumbar-sacral region is to the greatest extent susceptible to development of degenerative changes. Discopathic changes

affect mainly levels L4/L5 and L5/S1, sometimes L3/L4 and L2/L3, upper section of the spine is more stable and less vulnerable to overloading [2].

Among many factors having influence on health there is a group of factors related to working conditions. If working conditions are favourable, the work becomes a source of satisfaction, it does not cause health disorders and positively influences employees' condition [5].

The awareness of legal regulations, regarding for instance the permissible maximum lifting weight which is 12 kg for women, is important as well. This regulation was known to 40% of the surveyed nurses, while 55% respondents indicated higher weight values, thus exceeding the standard by 8 kg, and 4% of respondents exceeded the permissible limit by as much as 18 kg. The presented analysis shows that knowledge of law regulations regarding weight lifting among nurses, in spite of trainings in safety and hygiene at work, is still unsatisfactory and in 60% of nurses it requires complementation.

The research carried out by Bilski, Sykutera [9], as well as the research by Maciuk, Krajewska-Kulak, Klimaszewska [5] showed nurses' unsatisfactory knowledge of regulations regarding weight lifting – around 30% of nurses indicates higher permissible maximum weights for women.

In the present paper spine pain occurrence, its localization and radiating down to the buttocks and knees as well as limb numbness were analyzed. The research demonstrated also that the discopathy problem was closely connected with the working time and the shift types. Discopathy and related pain most frequently affect nurses who have performed nursing for over 21 years.

Similar observations were made in the research carried out among nurses in Łańcut and Biała Podlaska [4, 10] – spinal pain also affected mainly persons with job tenure over 21 years.

In each healthcare unit the most numerous group consists of nurses who perform shift work and feel spine pain mostly after the day shift [4, 5]. The authors' own research as well as research carried out by other scientists show that nurses report limb numbness, pain radiating down to the buttock and to the knee as most frequent symptoms related to discopathy. Among factors that may have impact on discopathy occurrence the forced body position, sudden change of the body position and hard physical labour are listed most frequently [4, 5].

Of the persons participating in the research carried out by Bilski [9] 71 associated lower spine pain with forced body position, 48 respondents stated that pain was caused by sudden change in body position and 55 persons associated the ailments with weight lifting.

The results of the research performed by Kułagowska [8] among anaesthesia nurses show that majority of respondents associated their musculoskeletal system pain first of all with an incorrect and forced body position during working and excessive physical strain.

In case of the spine load prevention and maintaining the body posture are of great importance. Lying several times a day for 15 minutes brings temporary relief, relaxes muscles and cause pain subside [11].

Publications regarding epidemiological research performed on the occupational group of nurses unequivocally prove that the lumbar-sacral discopathy problem is fairly common in this occupational group [1, 5, 10].

Conclusions

- Nurses' knowledge of legal regulations regarding permissible maximum lifting weights for women is low and requires complementation by safety and hygiene at work trainings;
- Spine pain is a significant problem in the occupational group of nurses, nursing staff with long job tenure is susceptible to discopathy.

References

1. Leszczyńska A, Daniszewska B, Dudek K. Wpływ ergonomii pracy pielęgniarek na występowanie dolegliwości bólowych w obrębie kręgosłupa. *Kwartalnik Ortopedyczny*. 2008, (2), 210–216.
2. Dobrogowski J, Wordliczek J. Zespoły bólowe narządu ruchu Bóle kręgosłupa. Warszawa: Wydawnictwo PZWL. 2008.
3. Kraemer J. Choroby krążka międzykręgowego, Wrocław: Wydawnictwo ELSEVIER. 2013.
4. Zyznawska J, Ćwiertnia B, Madetko R. Dolegliwości bólowe kręgosłupa w grupie zawodowej pielęgniarek i położnych. *Pielęgniarstwo Chirurgiczne i Angiologiczne*. 2011, 2: 54–59.
5. Maciuk M, Krajewska-Kulak E, Klimaszewska K. Samoocena występowania zespołów bólowych kręgosłupa u zawodowo czynnych pielęgniarek, *Problemy Higieny Epidemiologii*. 2012, 93(4): 728–738.
6. Sienkiewicz Z, Paszek T, Wrońska I. Strain no the spine – Professional threat to nurse's health. *Advances in Medical Sciences*. Volume 52 / 2007 Suppl. 1. 131–135.
7. Europejska Agencja Bezpieczeństwa i Zdrowia w Pracy - <http://www.osha.gov/ergonomics/guidelines/nursinghome/index.html>, Techniki postępowania z pacjentem w celu zapobiegania chorobom mięśniowo-szkieletowym u pracowników służby zdrowia) <http://osha.europa.eu> [07.04.2013]
8. Kułagowska E. Obciążenie układu mięśniowo-szkieletowego podczas prac wykonywanych przez pielęgniarkę anestezyjologiczną, *Medycyna Pracy*. 2008, 59(4):287–292.
9. Biłski B, Sykutera I. Uwarunkowania obciążeń układu ruchu i ich konsekwencje zdrowotne wśród pielęgniarek czterech poznańskich szpitali. *Medycyna Pracy*. 2004, 55(5): 411–416.
10. Trojan G, Probachta M, Wolan-Nieroda A, Bejer A, Kuźdżał A. Częstość występowania dolegliwości bólowych kręgosłupa wśród pielęgniarek zatrudnionych w szpitalu powiatowym w Łańcucie, *Young Sport Science Of Ukraine*. 2011, V.3. P. 300–305.
11. Jarosiewicz G. Jak chronić układ mięśniowo-szkieletowy podczas pracy. *Poradnik dla pracowników służby zdrowia*, Państwowa Inspekcja Pracy, Warszawa: PIP, 2010.

The manuscript accepted for editing: 21.10.2014

The manuscript accepted for publication: 27.10.2014

Funding Sources: This study was not supported.

Conflict of interest: The authors have no conflict of interest to declare.

Corresponding author:

Zofia Sienkiewicz

Erazma Ciołka 27

01-445 Warszawa, Poland

phone: +48 22 877 35 97

e-mail: zofia.sienkiewicz@gmail.com

Department of Social Nursing, Medical University of Warsaw