The Problem of Back Pain Among Nurses of Neurology and Neurosurgery Wards

Problem bólu kręgosłupa wśród pielęgniarek oddziałów neurologii i neurochirurgii

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Abstract

Introduction. In the occupational medicine back pain is treated as a paraoccupational disease, mainly related to specific professional groups. They include those employed in the sector of health care, who are at the highest risk of developing back pain, nurses in particular.
Aim. Assessment of back pain occurrence among nurses and determining the factors affecting this condition.
Material and Methods. The study group consisted of 76 nurses working in neurology and neurosurgery wards/clinics. The research methodology applied consisted of diagnostic survey method, and as the technique, a survey of our own design was used. The VAS Pain Scale was used. Statistical analysis was prepared in the program SPSS20. The statistical significance of differences was determined at a confidence level of $p<0.05$.
Results. 98.7% of the surveyed nurses complain about back pain. The biggest group consisted of those with very severe pain (47.4%). At the same time in 80.26% of cases the pain was located in the lumbosacral section. Multiple comparisons showed that the level of pain intensity was higher in those working on the contract than in the personnel working on the basis of a contract of employment ($p=0.045$). The analysis showed no statistically significant differences in the level of pain intensity between respondents in different workplaces: $Chi^2 (2)=3.69$; $p=0.158$.
Conclusions. The vast majority of nurses complain about back pain, in most cases it is a very strong pain. This pain is determined by seniority, form of employment (contract) as well as by additional activities apart from of work in the ward. **(JNNN 2016;5(3):84–91)**
Key Words: back pain, nurses

Streszczenie

Wstęp. W medycynie pracy bóle kręgosłupa traktowane są jako choroba parazawodowa, związana przede wszystkim z konkretnymi grupami zawodowymi. Wśród nich najbardziej narażonych na ryzyko rozwoju dolegliwości kręgosłupa należy wymienić pracowników sektorów opieki zdrowotnej, głównie pielęgniarki.
Cel. Ocena występowania bólu kręgosłupa wśród pielęgniarek oraz określenie czynników wpływających na ten stan.
Materiał i metody. Grupę badaną stanowiło 76 pielęgniarek pracujących w oddziałach/klinikach neurologii i neurochirurgii. W metodologii badań wykorzystano metodę sondażu diagnostycznego, techniką była ankieta własnej konstrukcji. Wykorzystano skalę bólu VAS. Analizy statystycznej dokonano w programie SPSS20. Istotność statystyczną różnic określono na poziomie ufności $p<0,05$.
Wyniki. 98,7% ankietowanych pielęgniarek skarży się na ból kręgosłupa. Największy udział stanowiły osoby z bardzo silnym bólem (47,4%). Jednocześnie ból ten w 80,26% umiejscowiony był w odcinku lędźwiowo-krzyżowym. Porównania wielokrotne wykazały, że poziom natężenia bólu był wyższy u osób pracujących na kontrakcie, niż u osób badanych pracujących na umowę o pracę ($p=0,045$). Analiza nie wykazała istotnych statystycznie różnic w poziomie natężenia bólu między osobami badanymi na różnych stanowiskach pracy: $Chi^2 (2)=3,69$; $p=0,158$.

Wnioski. Znaczna większość pielęgniarek skarży się na ból kręgosłupa, w większości przypadków jest to bardzo silny bólu. Ból ten jest determinowany stażem pracy, formą zatrudnienia (kontrakt) oraz dodatkową działalnością poza pracą w oddziale. **(PNN 2016;5(3):84–91)**

Słowa kluczowe: ból kręgosłupa, pielęgniarki

Introduction

Back pain is one of the most common health problems of highly-developed societies, at least 60% to 80% of the society complain of it, often taking the form of chronic pain [1–3]. It concerns not only the elderly, hard-working, miners, farmers, construction workers, but more often it affects young people [4,5]. It is pointed out in the literature that 44% of Poles suffer from the pain of the spine, which is the reason for their prolonged absence from work and it has a significant impact on reducing its quality [6]. In 23% of patients with pain in lumbar-sacral section and in 15% with pain in the neck there appears disability. It should be added that these pains are most often of recurring nature [7].

In the occupational medicine back pains are treated as a paraoccupational disease, mainly related to specific professional groups. They include those employed in the sector of health care, who are at the highest risk of developing back pain, mainly hospital staff, care and treatment and nursing care centres personnel including nurses [6,8].

Workplaces of most nurses are associated with the performance of many tasks requiring manual handling of patients. Hard physical work, chronic stress, the responsibility for the patient, insufficient number of staff on duty are the main factors generating back pain. In Poland, despite correctly formulated laws on women's work, the reality is far from being perfect. Nurses many times in the course of duty must choose between the good and safety of the patient and their health. Most of hygiene-nursing and nursing-treatment activities are performed in anteversion, and their duration ranges from 30 seconds to 12 or even 15 minutes [6].

There are numerous factors that determine back pain. Some of them depend on the employee, these are: the right posture while lifting, providing appropriate personal protective equipment and the assistance from colleagues. Nevertheless, 90% of the causes of all diagnosed cases of back pain is associated with maintaining forced postures of the body [1–3,7,8].

The main aim of the study is to assess the prevalence of back pain among nurses working in neurology and neurosurgery wards. Detailed research problems were formulated in the form of the following questions.

1. What is the degree and nature of back pain in nurses included in the study?

2. What work-related factors affect the severity of the pain?
3. Do the respondents have knowledge about the prevention of back pain and on ergonomics associated with the movement of patients and use it in practice?

Material and Methods

Subjects

The study group consisted of 76 nurses working in the wards/clinic of neurology and neurosurgery at the University Hospital No. 1 and University Hospital No. 2 in Bydgoszcz.

The vast majority of respondents are women (93.4%), aged 41 to 50 years (46.1%), urban residents (81.6%). Taking into account professional qualifications, the majority were people with secondary education (63.2%). Work experience over 21 years was declared by 43.42% of respondents. Currently, in neurology/neurosurgery wards there were employed 36.8% of the respondents with professional experience ranging 11–20 years. Most respondents also worked in shifts (85.5%), most often performing task of ward nurses (88.16%). In the analyzed group 63.16% of the respondents used the contract as a form of employment. Almost 41% of respondents were in the process of professional training and up to 93.42% of them considered their work for stressful. Details of the characteristics of respondents are presented in Table 1.

Methodology

In the methodology of research the diagnostic survey method was applied, and as a technique we used a survey of our own design, consisting of:

1. A Specification — consisting of questions regarding socio-demographic and job-related data.
2. The Visual Analog Scale of Pain VAS (*The Visual Analog Scale* — VAS) [9].

The Visual Analog Scale of Pain VAS is a graphical scale, on which the intensity of pain is assessed on the scale consisting of 11 degrees. The patient marks the level of pain perceived at the time, where 0 — means no pain, 1–3 weak pain, 4–6 moderate pain, 7–10 extreme pain.

Table 1. Characteristics of respondents

Variable	N	%
Gender		
Woman	71	93.42
Man	5	6.58
Age		
20–30	8	10.53
31–40	29	38.16
41–50	35	46.05
>50	4	5.26
Place of residence		
Country	14	18.42
City	62	81.58
Education		
Secondary	48	63.16
Higher	28	36.84
Job position		
Ward nurse	67	88.16
Theatre nurse	7	9.21
Nurse coordinator (ward nurse, deputy ward nurse)	2	2.63
Form of employment		
Contract	48	63.16
Contract of employment	27	35.53
Service contract	1	1.32
Type of work		
Single shift	11	14.47
Shift work	65	85.53
Seniority division		
Shorter than 5 years	7	9.21
5–10 years	11	14.47
11–20 years	25	32.89
>21 years	33	43.42
Seniority in the current ward		
Shorter than 5 years	11	14.47
5–10 years	18	23.68
11–20 years	28	36.84
>21 years	19	25.00
Work — a factor of stress		
Yes	71	93.42
No	5	6.58
Activities, apart from professional work		
Training courses (studies, specialisation, courses)	31	40.79
Care of an elder/dependent person	11	14.47
Work in another hospital/ward	6	7.89
Paid job, not related to the work performed	3	3.95
None	25	32.89

The scale allows the researcher accurately assess the severity of pain. Due to its simplicity and its universal application, this scale is one of the most commonly used tools for measuring pain intensity. Respondents evaluated the back pain that they perceived within the last week.

3. Closed questions concerning clinical conditions of the back pain reported and preventive actions taken in this regard.

The survey consisted in completing an anonymous questionnaire, during the hours of work, ticking the correct answer. Then the respondents placed the survey in envelopes and handed it to the ward nurse. Surveys were collected once a week.

Ethical Considerations

The protocol for this study was accepted by the Local Bioethical Committee, and all participants gave their formal consent to participate in the study.

Statistical Analysis

Statistical analysis was performed in the SPSS20 programme. In order to assess the relationship between various professional factors and those not related to the profession and the incidence of pain and the nature of pain, a statistical analysis of differences between the groups was carried out using the following tests: chi-square, the rho-Spearman correlation coefficient (ordinal nature of the variables), the Kruskal–Wallis test (unequally counted groups), the Mann–Whitney test (unequally counted groups).

The statistical significance of differences was determined at a confidence level of $p < 0.05$.

Results

Characteristics of Pain in the Respondents

At the beginning of the research respondents were asked the question: Do/Did you suffer from back pain? 75 out of 76 respondents answered that they do/did (Table 2).

Then, they were asked to assess the intensity of pain, according to the criteria of VAS Scale. The studies have shown that the average pain intensity was 6.2 (standard deviation SD=2.2). The largest number in the study group consisted of

Table 2. Characteristics of pain in the respondents

Characteristics of pain		N	%
Back Pain occurrence	Yes	75	98.68
	No	1	1.32
Pain Assessment acc. to VAS M=6.21 SD=2.23 Min=1 Max=10	No pain	0	0.00
	Weak pain	11	14.47
	Medium pain	29	38.16
	Severe pain	36	47.37
Location of pain	Cervical	28	36.84
	Thoracic	20	26.32
	Lumbar-sacral	61	80.26
Pain duration	<1 year	8	10.53
	2–5 years	29	38.16
	5–10 years	22	28.95
	Over 10 years	17	22.37
Type of pain	Dull	19	25.00
	Gradually growing	20	26.32
	Stinging	12	15.79
	Diffuse	5	6.58
	Radiating	47	61.84
	Unbearable	9	11.84

respondents with very severe pain (47.4%). At the same time the pain in 80.26% was located in the lumbosacral section (Table 2).

The answer to the question: How long have you been suffering from back pain?, in most cases was that the pain has persisted from 2 to 5 years (38.2%). Then the nurses evaluated the pain according to its nature. The largest part of the group consisted of respondents in whom back pain was of radiating nature (61.8%) (Table 2).

Pain and the Factors Associated with the Work Performed

Considering the factors affecting the pain associated with nurses' work, there were taken into account: the nature of work, seniority, additional job, form of employment, shift work, job position.

The analysis showed statistically significant differences in pain intensity in the respondents performing different activities outside work: Chi² (4)=10.75; p=0.029. Multiple comparisons showed that the level of pain intensity was higher in respondents dealing with, apart from work, caring for an older/not independent person than in the case of those participating in professional trainings (p=0.025) (Table 3).

Statistically significant differences in pain intensity were obtained between the respondents performing

Table 3. The intensity of the pain and the selected variables

Pain intensity and selected variables		Test	P
Additional work	Professional training	Chi² (4) =10.75*	P=0.029
	Care of an elder/ dependent person		
	Work in another hospital/ward		
	Paid job, not connected with the profession		
	None		
Form of employment	Contract	Chi² (2) =8.29*	P=0.016
	Contract of employment		
	Service contract		
Type of work	Single shift	Z=0.47**	P=0.636
	Shift work		
Job position	Ward nurse	Chi² (2) =3.69*	P=0.158
	Theatre nurse		
	Nurse coordinator		
Seniority overall	Shorter than 5 years	rho =0.31***	P=0.006
	5–10 years		
	11–20 years		
	>21 years		
Seniority in the current ward	Shorter than 5 years	rho =0.21***	P=0.064
	5–10 years		
	11–20 years		
	>21 years		

*chi-square test, **Mann–Whitney test, ***rho-Spearman correation coefficient

work on the basis of different forms of employment: Chi² (2)=8.29; p=0.016. Multiple comparisons showed that the level of pain intensity was higher in those working on the contract than in the case of respondents working based on employment contract (p=0.045) (Table 3).

Next, there were examined differences in pain intensity between the respondents working one shift, and those working shifts; the analysis was carried out with the use of the Mann–Whitney U test (groups not equal in number). The analysis showed no statistically significant differences in this respect: Z=0.47; p=0.636 (Table 3).

Then it was assessed whether there are differences in intensity level between the respondents working at various job positions; the analysis was carried out by the use of the Kruskal–Wallis test (groups not equal in number). The analysis showed no statistically significant differences in the level of pain intensity among respondents at different job positions: Chi² (2)=3.69; p=0.158 (Table 3).

Seniority is another variable considered. For this purpose, there were conducted rho-Spearman correlation analyses (ordinal nature of the variables). The analysis showed a statistically significant positive relationship between work experience and the intensity of pain — the longer the seniority the more severe pain in respondents (Table 3).

Issues of Ergonomics in the Prevention of Back Pain

Nurses were asked a question on the implementation of procedures for changing the position of a dependent patient — how many people participate in this action. The largest part in the study group consisted of respon-

dents receiving assistance only from 1 person (68.4%). Another question related to ergonomics was: Are your knees bent and at the same time is the spine erect while lifting the patient? Most of the respondents included persons who in the course of lifting the patient had their knees bent and at the same time the spine erect (60.5%). The nurses were also asked whether in the ward there is equipment for easy lifting and transport of patients. Most of them (85.5%) responded that in the wards there is no such equipment. Next, the nurses who have such equipment referred to the issue of its usability. 85.5% of respondents do not use such facilities. Then, the respondents defined: how many patients they lift during their duty. Most of them (59.2%) answered that lift 5–10 patients.

Further questions referred to the issue of labour law. And so, one of the questions concerned weight standards, which can be carried by a woman. The correct answer (20 kg) was provided by 57.9% of respondents. In the second question, the nurses were to determine the frequency with which women can carry the maximum permissible weight during their hours of work. Most of those surveyed think that the nurse can carry the maximum permissible weight of up to 4 times per hour (44.7%).

Then, the nurses were asked about the knowledge of exercises strengthening the spine. The majority of respondents (93.4%) answered that they knew such exercises, and 56.6% of them apply them every day.

Detailed relevant data are presented in Table 4.

Table 4. Prevention of back pain according to respondents

Issues of ergonomics at work regarding prevention of back pain		N	%
Making a change in the position of a dependent patient	Always onself	2	2.63
	Mostly oneself	3	3.95
	With assistance from 1 person	52	68.42
	With assistance from 2–3 persons	19	25.00
	Always onself	2	2.63
Ergonomic lifting the patient	Yes	46	60.53
	No	30	39.47
Equipment availability in the ward	Yes	11	14.47
	No	65	85.53
Use of equipment to facilitate lifting patients	Yes	11	14.47
	No	65	85.53
Number of patients lifted by the nurse	<5	8	10.53
	5–10	45	59.21
	11–20	16	21.05
	21–30	7	9.21
Standard weight lifted by women at work	10 kg	6	7.89
	15 kg	22	28.95
	20 kg	44	57.89
	22 kg	4	5.26
The frequency of lifting the maximum weight by a woman	Once an hour	21	27.63
	Up to 3 times an hour	21	27.63
	Up to 4 times an hour	34	44.74
	Up to 8 times an hour	0	0.00
Konwledge of exercises strengthening the spine	Yes	71	93.42
	No	5	6.58
Practoical application of exercises	Yes	43	56.58
	No	33	43.2

Discussion

Back pain is a very common phenomenon. Hospital staff present a higher incidence rates of chronic low back pain compared to the general population, due to physical and emotional factors related to their professional activity [10].

Work of most nurses is associated with the performance of many tasks requiring manual handling of patients. Significant physical strain of nurses working in the hospital environment destructively affects the motor system. Back pain is the most frequent ailment. These problems can reduce functional capabilities of nurses in the workplace and deteriorate the quality of their work. If this situation continues, the severity of back pain symptoms increases, and injuries at work take place [6,8].

The literature provides almost epidemic nature of back pain in this occupational group [11–13]. Leszczyńska et al. [14], in the study of 400 randomly selected nurses from Lodz health care centres, showed that in the period of 2007–2008, up to 80% of them reported the occurrence of back pain. Lorencowicz et al. [15]

showed that 95.2% of the nurses surveyed manifested a problem with back pain. Maciuk et al. [6] reported that 81% of nurses felt pain in the lumbar spine, which, according to them, resulted mainly from lifting heavy objects; the pain of the cervical spine affected more than half of the respondents. In Norway, 88.8% of nurses aged over 50 years complain of back pain [16]. A study conducted in two selected hospitals in Nigeria and Ethiopia also revealed high prevalence of low back pain (71%) among nurses [17]. Similarly, other studies — in Greece [18], Turkey [19] — emphasized that nurses have the highest risk of back pain among the entire hospital staff. In this study, this problem affects 98.7% of nurses, where the average value of pain measured by the VAS Scale reached 6.2 pts, which indicates a very strong pain. Zyznawska et al [8] gives an average of 5.8 points on this scale, and in the research by Stefanowicz et al [20] the average intensity of low back pain among nursing students, amounted to 4.17 points on the VAS Scale. According to Cheung [21] back pain in nursing staff appear already at the stage of studies, which should trigger a discussion about the need for a thorough education in the field of ergonomics in the educational process of this professional group.

Time and nature of pain indicate the type of pathomorphological changes in the spine. In the study group, most frequently there occurred pains of a gradually increasing nature (26.3%) and dull pain (25%). Maciuk et al [6] report that most of the nurses described the pain as recurrent lumbar spine, with a gradually increasing numbness, and approximately 65% determines it — as the gradually growing, recurrent, dull, diffuse of numb nature; as many as 70% of respondents report that they feel radiation of pain of the lumbar spine to the lower extremities.

In our studies, pain was most commonly related to the lumbosacral spine section (80.3%). Abou El-Soud et al. [10] also point out that the majority of nurses locate the pain in the lower part of the spine (68.1%), whereas 10.08% associate it with numbness or radiation to the lower extremities, and 7.6% complain about the lower back pain associated with paralysis of the lower limbs. It is also consistent with the studies described by Wong et al. [22] or Maciuk et al. [6].

Most nurses described in the study were in the age group ranging 41–50 years, with seniority in 43.42% of cases longer than 21 years. This is confirmed by the studies carried out by Abou El-Soud et al. [10], who have found that nurses with professional experience exceeding 20 years (86.1%) most often complain about the back pain. Similarly, Tinubu et al. [23] showed that the relative risk of musculoskeletal disorders related to work is approximately four times higher among nurses with more than 20 years of working experience, than in the case of those with 11–20 years of experience, as well as two times higher compared to nurses with 1–10 years of clinical experience. Correlation of age and back pain is often emphasized in the literature [6,8,10,17,23].

Quite a lot of nurses working in hospital wards use the contract as a form of employment — in this study it corresponds to 63.16% of respondents. This repeatedly leads to non-compliance with standards of working time, which primarily is not indifferent to the musculoskeletal system as well asto the whole organism. Multiple comparisons showed that the level of pain intensity was higher in those working on the contract, than in respondents working on the basis of an employment contract. This is contrary to the opinion that such factors of work, as seniority in a company, duration of employment, shift work, hours of work per month, have no significant connection with complaints about back pain among nurses [10,22,23].

Some authors [24,25] emphasize that the reduction of pain in nurses would be significantly affected by a complete elimination of manual lifting of patients, which suggests a prevalence of lifting equipment in hospital wards. The studies carried out showed that 57.9% of respondents knew the accepted limit of loads carried by women during their work, and 44.7% could define the frequency of lifting such weights. In the studies by Maciuk et al. [6] 30% of respondents defined higher acceptable weight values manually lifted for women in permanent jobs, and 61% of respondents — the lower limits of weight for men.

The fact of insufficient ancillary equipment provided in hospital wards as well as the lack of organizational and technical solutions in this field seem to be a matter of high concern. The research by Leszczyńska et al. [14] demonstrated the use of ancillary equipment only by 11% of respondents. In the study by Maciuk et al. [6] more than half of the nurses claimed that their wards did not have beds equipped with jibs. In our material, 85.5% of respondents replied that the wards were not provided with appropriate equipment facilitating work with disabled patients. This analysis shows another very important issue — in places where such equipment is available only about 15% of nurses use it.

According to Zyznawska et al. [8] nuisance in work performed by nurses is additionally hindered by not ergonomic solutions in hospital premises (narrow corridors, doors), but also by stress and psychological burden. In the population studied 93.4% of respondents consider theirwork place as stress generating.

Conclusions

1. The studies have shown that 98.7% of surveyed nurses complain about back pain, in most cases it is a very strong pain.

2. The severity of pain in nurses is influenced by seniority and form of employment (contract), as well as additional work in the form of care for anon-independent person.
3. The surveyed nurses declare knowledge of back pain prevention and of ergonomics at work, however the huge problem consists in the lack of equipment in wards to facilitate the movement of patients, as well as in reluctance to its use.

Implications for Nursing Practice

It is necessary to implement obligatory educational programmes for the employees of the Polish health care system, including nurses, to present to them the best possible ways to avoid problems associated with backpain. Such programs should include practical sessions related to lifting, handling patients, as well as examples of exercises possible to perform at work or ways to cope with stress. The leading goal should consist in providing hospital units with the necessary equipment to facilitate work with the non-independent patient as well as further training of employees in connection with its use. The effectiveness of these programmes has been emphasized in the literature for a long time [26,27]. Such trainings should be obligatory for nurses also for the purpose of supporting effective care of the patient.

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