ASSOCIATION OF RISK FACTORS WITH THE INCIDENCE OF LUMBAR PAIN SYNDROME IN PHYSIOTHERAPISTS AT THE CLINIC FOR PHYSICAL MEDICINE AND REHABILITATION

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ABSTRACT

Introduction: Lumbar pain syndrome encompasses various entities manifested by pain, muscle tension, or discomfort between the lower rib arch and the lower gluteal fold, with or without radiation to the leg.

Aim: To examine the association of existing risk factors with the incidence of lumbar pain syndrome in physiotherapists.

Subjects and Methods: The research was designed as a cross-sectional study and conducted at the Clinic for Physical Medicine and Rehabilitation, University Clinical Hospital Mostar. The study included physiotherapists of both genders and all age groups who did not have a previous history of spinal disease and had more than one year of work experience. Data were collected through anonymous surveys, and the modified Nordic Questionnaire for musculoskeletal symptom analysis was used as the research instrument. This questionnaire consists of four parts: socio-demographic data, healthcare provision, lower back pain, and job satisfaction.

Results: The prevalence of lumbar pain in the last 12 months was around 94.0%. The study involved 56 participants, most of whom were female, with the majority being in the 31-40 age group with higher education. Males were slightly overweight, and the duration of lumbar pain was associated with the gender of the participants.

Conclusion: Participants who lifted heavier loads experienced significantly more lumbar spine pain, while the duration of work experience was not significantly associated with the incidence of lumbar pain syndrome.

Keywords: lower back pain, risk factors, physical activity, daily life activities, physiotherapists

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INTRODUCTION

Lower back pain conditions represent a growing economic and psychosocial burden and often lead to temporary work disability. Lumbar pain syndrome encompasses various entities manifested by pain, muscle tension, or discomfort between the lower rib arch and the lower gluteal fold, with or without radiation to the leg (1, 2). Most conditions that cause disabling pain in the lumbar region have a benign course and do not require active treatment. Symptoms and changes may vary depending on the involvement of certain segments, structures, and systems, including vertebrae, vertebral dynamic segments, intervertebral discs (discogenic) with or without nerve root pressure (radiculopathy), and degenerative changes (3, 4). Various factors, such as lack of physical activity, improper lifting techniques, genetics, sudden jerks, obesity, and stress, can cause lumbar pain syndrome (5, 6). Clinically, it manifests as reduced mobility and pain, with the acute form characterized by sudden onset, limited mobility, and exacerbation of pain during coughing, sneezing, and laughing, while the chronic form lasts more than 3 months, with milder symptoms, increased muscle tone, and limited mobility (5, 7).

Lumbar pain syndrome represents a significant medical-economic challenge, affecting 75-80% of the working population aged 35-55, with frequent work absences. Its prevalence increases with age and affects both men and women equally, although postmenopausal women are more likely to suffer from lumbar syndrome than men (8). Risk factors include age, gender, smoking, physical strain, job characteristics, and psychological factors. Physical and psychosocial factors, such as lack of physical activity, obesity, increased workload, reduced time for rest or recreational activities, job dissatisfaction, and stress, are also associated with the onset of pain (7, 9, 10). Work organization risk factors include low job satisfaction, excessive job demands, lack of support from colleagues and superiors, and fear of recurrence of the problem (7).

Diagnosis of lumbar pain syndrome involves the use of the Visual Analog Scale (VAS) for pain (11-13) and physical therapy assessments of spinal mobility using various methods, including the Thomayer method for range of motion measurement (14), the Schober method for assessing sagittal flexibility of the lumbar spine, and lateral flexibility tests in a standing position (5).

Treatment of lumbar pain syndrome may require a multidisciplinary approach and an individualized treatment plan. The acute form usually has a favorable outcome, with recovery in 70% of cases within a month, and almost 90% of patients are symptom-free after 3 months. Promotion of physical activity and a healthy lifestyle should be based on the example set by healthcare workers, as prevention and health preservation play a crucial role (15).

Lumbar pain syndrome among physiotherapists is a serious issue caused by repetitive physical efforts such as manual procedures, lifting loads, and improper movements (10, 16, 17). Physiotherapists often perform physically demanding work that includes repetitive movements and awkward body positions, significantly straining their musculoskeletal system (17).

Physiotherapy includes kinesitherapy, physical therapy, and massage, each with different stress loads on the spine (18, 19). Physiotherapists' work activities involve forced body positions, trunk bending and rotation under load, and often lifting patients, which increases the risk of injury (20). Moreover, physiotherapists' working hours often exceed legal limits, further increasing the load (21, 22).

Despite research on the prevalence of lower back pain among healthcare professionals, little attention has been paid to specific specializations within physiotherapy (kinesitherapy, physical therapy, massage) and their association with the risk of back pain (23). Given the high prevalence of spinal problems among physiotherapists, it is important to investigate whether the nature of work in a particular specialization is associated with a higher risk of these problems.

Aim of the research: To examine the association of existing risk factors with the incidence of lumbar pain syndrome in physiotherapists.

SUBJECTS AND METHODS

The study was designed as a cross-sectional study and conducted at the Clinic for Physical Medicine and Rehabilitation, University Clinical Hospital Mostar, between May and June 2022. A total of 56 physiotherapists participated in the study.

Inclusion criteria were individuals employed as physiotherapists at the Clinic for Physical Medicine and Rehabilitation, of both genders and all age groups. Exclusion criteria included individuals with previous spinal injuries, spinal deformities and/or lower limb deformities, pregnant women (due to possible spine pain associated with pregnancy), and individuals with less than one year of work experience.

The survey was conducted voluntarily and anonymously. All participants were verbally informed in detail about the nature of the study and that it would not harm their health, after which they were offered to sign informed consent

along with the questionnaire, which described the research objectives, who conducted the study, and instructions on the format of the questionnaire. All data obtained from the study were used solely for research purposes.

For the purpose of this study, a modified Nordic Questionnaire for the analysis of musculoskeletal symptoms (24) was used, which contains four categories of questions divided into four sections: socio-demographic data, healthcare provision, lower back pain, and job satisfaction.

The first part, which related to socio-demographic data, included information on gender, age, education level, body weight and height, years of work experience, working hours, overtime, and physical activity.

The second part of the questionnaire, related to the performance of healthcare tasks, was filled out only by participants involved in healthcare services, and the questions concerned the length of work experience in these tasks, the number of patients, lifting loads, and other job duties.

The third part of the questionnaire, related to the presence of lumbar pain, consisted of questions about the presence of lumbar pain in the last 12 months, the duration of lower back problems in the past 12 months, the duration of pain in the lower back in a single episode, reduction in work and free-time activities, the presence of lower back problems at any point in the last 7 days, episodes of lumbar pain in the last 12 months, time off work due to these issues, medication use and treatment, as well as changes in work position due to pain.

The final part of the questionnaire consisted of questions aimed at gathering information about psychosocial work factors through the Standardized Nordic Questionnaire for psychological and social work factors, which provides a comprehensive measure of stress. The questions in this part of the questionnaire were divided into three groups: work task levels, social and organizational levels, and individual levels (15). The research was approved by the Ethics Committee of the Faculty of Health Studies, University of Mostar and University Clinical Hospital Mostar.

Statistical Analysis

The data were subjected to statistical analysis using descriptive statistical methods. To assess the significance of differences between nominal and ordinal variables, the chi-square test was applied, with the significance level set at $p<0.05$. Values less than 0.001 were expressed as $P<0.001$.

For statistical analysis of the obtained data, the software system SPSS for Windows (version 13.0, SPSS Inc, Chicago, Illinois, USA) and Microsoft Excel (version Office 2007, Microsoft Corporation, Redmond, WA, USA) were used.

RESULTS

A total of 56 participants (100.0%) took part in the survey, of which 18 (28.57%) were male, and 40 (71.43%) were female. Most of the participants were aged between 31 and 40 years (32.80%), while 24 (42.86%) had higher education, and 33 (58.97%) had between 5 and 15 years of work experience (Table 1).

Table 1. *Socio-demographic data of the participants*

	Gender		
	Women N (%)	**Men N (%)**	**Total N (%)**
Total number of participants	40 (71,43)	16 (28,57)	56 (100)
Dob			
<20	0 (0)	0 (0)	0 (0)
21-30	8 (20)	2 (12,50)	10 (17,85)
31-40	21(52,50)	12 (75)	33 (58,93)
41-50	5 (12,50)	0 (0)	5 (8,93)
>50	6 (15)	2 (12,50)	8 (14,29)
Height (cm)			
	20 (50)	1 (6,25)	21 (37,50)
170-180	18 (45)	3 (18,75)	21 (37,50)
	2 (5)	12 (75)	14 (25)
Weight (kg)			
	13 (32,50)	0 (0)	13 (23,21)
70-80	17 (42,50)	6 (37,50)	23 (41,07)
	10 (25)	10 (62,50)	20 (35,72)
Work experience			
	4 (10)	3(18,75)	7 (12,50)
5-15	24 (60)	9 (56,25)	33 (58,93)
16-25	4(10)	4 (25)	8 (14,29)
	8(20)	0 (0)	8 (14,29)
Work with patients (hours/week)			
	0 (0)	0 (0)	0 (0)
30-40	39 (36)	12 (26)	51 (34)
	1 (13)	4 (31)	5 (20)
Education level			
Secondary education	6 (15)	3 (18,75)	9 (16,07)
Post-secondary education	6 (15)	0 (0)	6 (10,71)
Higher education	18 (45)	6 (37,50)	24 (42,86)
Master's degree	14 (35)	3 (18,75)	17 (30,36)

The average body mass index (BMI) of all participants was normal (24.94). The average BMI for women was normal (24.33), while men had slightly overweight BMI (26.67).

The duration of lumbar pain was associated with the gender of the participants ($p<0.05$). Compared to women, men reported longer durations of lumbar pain (Table 2).

Table 2. *Characteristics of work-related lumbar pain in physiotherapists*

	Women N (%)	Men N (%)	Total N (%)	Significane
Back pain in the last 7 days				
Yes	20 (50,00)	6 (38,00)	26(46,43)	p<0,05
No	20 (50,00)	10 (62,00)	30 (53,57)	p<0,05
Back pain in the last 12 months				
None	4 (10,00)	1 (11,00)	5 (8,77)	P>0,05
Mild pain/discomfort	10 (25,00)	6	16 (28,07)	P>0,05
Moderate – does not require a work break	10 (25,00)	4 (54,00)	14 (24,56)	P>0,05
Moderate – requires a work break	9 (22,50)	4 (21,00)	13 (22,80)	P>0,05
Severe pain	7 (17,50)	1 (14,00)	8 (14,03)	P>0,05
Duration of work-related back pain (weeks)				
<1	27 (67,50)	10 (62,50)	37 (66,07)	p<0,05
2-4	7 (17,50)	3 (18,75)	10 (17,86)	p<0,05
>4	6 (15,00)	3 (18,75)	9 (16,07)	p<0,05
Impact of back pain on daily activities (shopping, household chores, gardening)				
Yes, it affects	26 (65,00)	9 (5,25)	35 (62,50)	P>0,05
No, it does not affect	14 (35,00)	7 (43,75)	21 (37,50)	P>0,05
Reduced work activity due to back pain				
Yes	24 (60,00)	6 (37,50)	30 (53,57)	P>0,05
No	16 (40,00)	10 (62,50)	26 (46,43)	P>0,05
Consequences of back pain in the last 12 months				
Sick leave	10 (25,00)	4 (25,00)	14 (25,00)	P>0,05
Hospitalization	1 (2,50)	0 (0,00)	1 (1,79)	P>0,05
Medication use	29(72,50)	12 (75)	41(73,21)	P>0,05
Change of workplace	0 (0,00)	29 (0,00)	0 (0,00)	P>0,05

Three participants (10.35%) with a BMI below 25 reported severe lumbar pain, while five participants (18.51%) with a BMI over 25 reported severe lumbar pain. Higher body weight in most participants caused discomfort or moderate pain, which was statistically significant (Table 3).

Table 3. *Association between lumbar pain and body mass index (BMI)*

BMI / Level of lumbar pain	**<= 25 N (%)**	**>25 N (%)**	**Total N (%)**	**Significane**
None	4 (13,79)	1 (3,70)	5 (8,77)	p<0,05
Mild pain/discomfort	9 (31,03)	7 (25,93)	16 (28,07)	p<0,05
Moderate – does not require a work break	7 (24,14)	7 (25,93)	14 (24,56)	p<0,05
Moderate – requires a work break	6 (20,69)	7 (25,93)	13 (22,80)	p<0,05
Severe pain	3 (10,35)	5 (18,51)	8 (14,03)	p<0,05

BMI – Body Mass Index

Participants who lifted heavier loads experienced significantly more lumbar pain, which was statistically significant (p<0.05) (Table 4).

In this study, the length of work experience did not affect the level of lumbar pain (Table 5).

Table 4. *Association between lifting weights (in kilograms) and lumbar pain*

Weight of the load / Level of lumbar pain	**Do 10kg N (%)**	**Između 10-25kg N (%)**	**Više od 25kg N (%)**	**Total N (%)**	**Significane**
None	0 (0,00)	3 (25,00)	2 (5,13)	5 (8,77)	p<0,05
Mild pain/discomfort	1 (20,00)	3 (25,00)	12 (30,77)	16 (28,07)	p<0,05
Moderate – does not require a work break	2 (40,00)	2 (16,67)	10 (25,64)	14 (24,56)	p<0,05
Moderate – requires a work break	2 (40,00)	1 (8,33)	10 (25,64)	13 (22,80)	p<0,05
Severe pain	0 (0,00)	3 (25,00)	5 (12,82)	8 (14,03)	p<0,05

Table 5. *Association between work experience (in years) and lumbar pain*

Length of work experience / Level of lumbar pain	<5g N (%)	5-15g N (%)	16-25g N (%)	>25g N (%)	Total N (%)	Significane
None	1 (14,29)	4 (12,12)	0 (0,00)	0 (0,00)	5 (8,77)	P>0,05
Mild pain/discomfort	0 (0,00)	9 (27,27)	3 (37,50)	4 (50,00)	16 (28,07)	P>0,05
Moderate – does not require a work break	2 (28,57)	7 (21,21)	2 (25,00)	3 (37,50)	14 (24,56)	P>0,05
Moderate – requires a work break	2 (28,57)	8 (24,24)	2 (25,00)	1 (12,50)	13 (22,80)	P>0,05
Severe pain	2 (28,57)	5 (15,15)	1 (12,5)	0 (0,00)	8 (14,03)	P>0,05

DISCUSSION

This study reported a prevalence of around 90.0% of work-related lumbar pain syndrome among physiotherapists at the Clinic for Physical Medicine and Rehabilitation, University Clinical Hospital Mostar. Among them, 46.0% of physiotherapists stated that they were experiencing pain at the time of the study. The results of this study show that gender, heavy workloads, and body weight were associated with the occurrence of lumbar pain syndrome in physiotherapists. The findings of this study are similar to other international studies from New Delhi (25), the United States (26), and Slovenia (27), which reported an incidence of work-related lumbar pain among physiotherapists ranging from 26.0% to 84.0%.

The high prevalence of lumbar pain among our participants may be due to the use of the Nordic Questionnaire, where the presence of pain also includes discomfort, so it is possible that a certain number of participants experienced only discomfort but not actual pain.

Professions such as physiotherapy, which involve frequent lifting, bending, or standing, are at risk for developing lumbar pain syndrome. If we add to that the fact that physiotherapists have appropriate knowledge of musculoskeletal injuries and various prevention strategies, this does not protect them from developing lumbar pain syndrome (28). Evidence shows that physiotherapists tend to work while in pain or with musculoskeletal injuries, even while worsening their condition. They are less likely to report their injuries or seek care, relying on self-treatment based on their clinical expertise (29).

The higher prevalence of work-related lumbar pain among physiotherapists could be a consequence of either extreme workload in the work environment or improper musculoskeletal techniques used in patient treatment. Physiotherapists can overstrain their muscles and joints during work, increasing the risk of pain development (23).

In this study, 56 participants took part, of whom 40 were female, and 16 were male. The study showed a statistically significant higher occurrence of lumbar pain among female participants compared to males. The results of this study align with other studies, which indicate a higher

prevalence of lumbar pain in women than in men, showing that lumbar pain syndrome is more common in women than in men (30). This could also be related to the fact that a large portion of physiotherapists are women, who, due to the smaller number of male workers, often have to perform physically demanding tasks, which also contributes to the high prevalence of lumbar pain among them (31).

Algadir and colleagues, in their study, found that female physiotherapists were at a higher risk of developing lumbar pain after becoming physiotherapists compared to male physiotherapists. They believe that women's smaller physical stature (heavier but shorter) compared to men is a disadvantage for women when lifting or transferring patients and applying physical force during treatment, which increases spinal strain and consequently leads to back pain (25).

Most studies show that the first episode of lumbar pain usually occurs between the ages of 30 and 50. The participants in our study had an average age of around 38 years. The results of this study are consistent with other studies, which indicate a high statistical correlation between lumbar pain and age, where a larger number of healthcare workers under the age of 30 reported the presence of lumbar pain (32).

Previous studies have found that lumbar pain syndrome is more common among newly graduated students and young physiotherapists, primarily within the first five years of practice (33), while in this study, the length of work experience did not affect the incidence of lumbar pain syndrome.

Obesity and the additional strain on the spine caused by extra weight also trigger back pain (30). In our study, there is a positive correlation between BMI and lumbar pain. More than half of the participants with a BMI over 25, i.e., those who are overweight, experienced moderate to severe lumbar pain, while a smaller percentage of lumbar pain was observed in participants with ideal body weight, representing a statistical difference and indicating a connection between excessive body weight and lumbar pain.

Lifting patients is identified in most literature as the primary activity associated with the onset of lumbar pain during patient transfers. This includes lifting heavy patients, frequent lifting, and lifting without the help of colleagues (25). In our study, for the majority of participants (66.07%), lumbar pain lasted up to one week, while for a smaller number of participants (16.07%), it lasted slightly more than four weeks. Due to the presence of lumbar pain, 53.57% of participants in our study experienced reduced work activities, and slightly more than half of the participants had reduced activities during their free time and were unable to perform daily activities.

Homaid and colleagues, in their study, showed that lumbar pain had an impact on leisure activities in 39.5% of participants and on work activities in 41.8% (32). Such data increase the risk of future injuries and absences from work.

According to data from Cilliers and colleagues, 46% of participants first consulted a general practitioner or physiotherapist, 28.0% chose rest as a treatment method, while 12.0% used medications (34). Such data can be

explained by the fact that healthcare professionals have access to medications, which they use on their own initiative.

The limitations of this study are primarily the small sample size and the lack of functional measurements of spinal mobility, as this is a survey-based study. Recommendations for future research on this topic include: a larger sample size, covering more institutions where physiotherapists work, and applying a division by specialty due to the nature of the work that individual physiotherapists primarily perform (kinesitherapy, massage, electrotherapy, etc.), as well as including functional measurements of spinal mobility in the research methodology.

CONCLUSION

The average body mass index (BMI) for women was within normal limits, while for men, it was slightly elevated. The duration of lumbar pain averaged up to one week, with severe lower back pain more frequently affecting women. It was observed that participants exposed to heavier workloads had a significantly higher predisposition to lumbar pain syndrome, while the length of work experience did not significantly affect the occurrence of this issue. A statistically significant negative correlation was found between gender, workload, and body weight with lumbar pain syndrome among physiotherapists.

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POVEZANOST RIZIČNIH ČIMBENIKA S POJAVNOŠĆU LUMBALNOG BOLNOG SINDROMA KOD FIZIOTERAPEUTA NA KLINICI ZA FIZIKALNU MEDICINU I REHABILITACIJU

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SAŽETAK

Uvod**:** Lumbalni bolni sindrom obuhvaća različite entitete koji se manifestiraju bolnošću, mišićnom napetosti ili nelagodom između donjeg rebrenog luka i donje glutealne brazde, sa ili bez širenja u nogu.

Cilj**:** Ispitati povezanost postojećih faktora rizika na pojavnost lumbalnog bolnog sindroma kod fizioterapeuta.

Ispitanici i metode: Istraživanje je ustrojeno kao presječna studija i provedeno je na Klinici za fizikalnu medicinu i rehabilitaciju Sveučilišne kliničke bolnice Mostar. U istraživanje su uključeni fizioterapeuti oba spola i svih dobnih skupina koji nisu imali prethodnu povijest bolesti vezano za kralježnicu a imaju više od jednu godinu radnog staža. Podaci su prikupljeni anonimnim anketiranjem ispitanika, a kao instrument istraživanja korišten je modificirani Nordijski upitnik za analizu muskulo - skeletnih simptoma. Ovaj upitnik se sastoji od 4 dijela: socio-demografski podaci, obavljanje zdravstvene njege, bol u donjem dijelu leđa, te zadovoljstvo na radnom mjestu.

Rezultati: Prevalenca lumbalnog bola u posljednjih 12 mjeseci bila je oko 94.0 %. U Istraživanju je sudjelovalo je 56 ispitanika od koji je više bilo ženskog spola, a prevladavala je starosna skupina od 31-40 godina sa visokom stručnom spremom. Muškarci su imali blago prekomjernu tjelesnu težinu a trajanje lumbalnog bola povezano je sa spolom ispitanika.

Zaključak: Ispitanici koji su podizali više tereta imali su značajno veću bol u lumbalnom dijelu kralježnice, dok duljina radnog staža nije značajno povezana s pojavnošću lumbalnog bolnog sindroma.

Ključne riječi: križobolja, faktori rizika, tjelesna aktivnost, aktivnosti svakodnevnog života, fizioterapeuti

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