Agri 2017;29(2):71–78

doi: 10.5505/agri.2017.32549

ORIGINAL ARTICLE

Prevalence of and risk factors for low back pain among healthcare workers in Denizli

Denizli'de sağlık çalışanlarında bel ağrısı prevelansı ve risk faktörleri

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Summary

Objectives: The purpose of this study was to examine personal, occupational, and psychosocial risk factors affecting prevalence of low back pain in healthcare workers.

Methods: Study included total of 1682 participants (1010 female, 672 male) working at Denizli State Hospital. Low back pain section of Standardized Nordic Musculoskeletal Questionnaire (SNMA) was used to evaluate recent occurrence, pain experienced within previous year, and over lifetime. Perceived Stress Scale and Job Satisfaction Scale were also administered.

Results: Prevalence of lifetime low back pain in healthcare workers was determined to be 53% based on SNMA. It was observed that low back pain was most common among medical secretaries (56.9%). Advanced age, female gender, high body mass index (p=0.002), being married (p=0.0001), lack of regular exercise (p=0.009), working for more than 4 hours while standing (p=0.012) or sitting at desk (p=0.021), using computer for more than 4 hours (p=0.0001), greater number of years of service (p=0.001), and low job satisfaction (p=0.001) were found to be factors increasing low back pain risk.

Conclusion: Our study demonstrated that healthcare workers are among group with high risk of low back pain.

Keywords: Healthcare workers; low back pain; prevalence; risk factors.

Özet

Amaç: Sağlık çalışanlarında bel ağrısı prevalansını, etkileyen kişisel, işle ilişkili ve psikososyal risk faktörlerini incelemektir.

Gereç ve Yöntem: Çalışmamıza Denizli Devlet Hastanesi'nde görev yapan, çalışmaya katılmayı kabul eden 1010 kadın ve 672 erkek toplam 1682 katılımcı dâhil edildi. Nokta ve yıllık prevalansın değerlendirilmesinde Standardize Nordik Muskuloskeletal Anketinin (SNMA) genel bölümünde yer alan bel ağrısı ile ilgili kısım kullanıldı. Psikososyal faktörlerin değerlendirilmesi kapsamında, katılımcıların stres düzeyi 'Algılanan Stres Ölçeği', iş memnuniyeti 'İş Doyum Ölçeği' kullanılarak gerekli veriler elde edildi.

Bulgular: Sağlık çalışanlarında yaşam boyu bel ağrısı prevalansı %53 olarak saptandı. En fazla bel ağrısının tıbbi sekreterlerde (%56,9) olduğu tespit edildi. İleri yaş, kadın cinsiyet, Vücut Kitle İndeksinin (VKİ) yüksek olması (p=0,002), evli olmak ve egzersiz alışkanlığının olmaması (p=0,009), ayakta durarak (p=0,012) ve oturarak 4 saatten fazla çalışma (p=0,021), 4 saatten fazla bilgisayar kullanma (p=0,001), artmış hizmet yılı (p=0,001) ve iş memnuniyetinin az olması (p=0,001) bel ağrısı riskini artıran faktörler olarak saptandı.

Sonuç: Çalışmamız sağlık çalışanlarının bel ağrısı açısından yüksek risk grubunda olduğunu göstermiştir.

Anahtar sözcükler: Sağlık çalışanları; bel ağrısı; prevalans; risk faktörleri.

Introduction

Pain is a psychologically challenging physiological function with a vital importance and disturbing the life quality of the person, preventing the person to be productive, and causing sleeping disorders.[1] Low back pain is a very common disorder in all societies causing workforce losses. It is ranked as the fifth reason for consulting a physician.[2] Low back pain issues have been encountered as a health problem in all historical ages and its history goes back to B.C. 1500.[3] Low back pain

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Submitted *(Başvuru tarihi)* 01.03.2016 Accepted after revision *(Düzeltme sonrası kabul tarihi)* 05.04.2017

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is witnessed in all cultures and ethnic groups.[4]

It is observed that the point prevalence is 12–33%, annual prevalence is 22–65% and lifetime prevalence is 11–84% in all studies on low back pain.[5–7] It is demonstrated that there are various risk factors affecting the incidence and prevalence of low back pain in the epidemiological studies performed. These risk factors are divided into 3; as personal, occupational and psychosocial.[8,9] Age, gender, body mass index, family history, smoking, alcohol usage a physical activity level can be listed among personal risk factors. Sudden physical load, bending forwards, twisting, heavy lifting, exposure to vibration and staying in the same posture for long periods of time can be counted among the occupational risk factors.[9] The relation between low back pain and depression can be explained with neurological mechanisms. It affects the response mood to the painful physical stimulus caused via serotonin and norepinephrine in the brain.[10] Persons stating that their job was boring, monotone or non-satisfactory in terms of psychosocial risk factors complain from low back pain at a higher level.[11] It is reported that depression and anxiety are among the important risk factors in patients with chronic low back pain.[12]

Majority of healthcare professionals has the risk of musculoskeletal system disorders. The risk groups of low back pain among healthcare professionals are physicians, dentists, nurses, physiotherapists, laboratory workers and caregivers.[13] Our study is planned for the purpose of examining the low back pain prevalence and effects of personal, occupational and psychosocial risk factors among healthcare workers at Denizli State Hospital.

Materials and Methods

Study design and participants

Our study included a total of 1682 participants working at Denizli State Hospital, of whom 1010 were female and 672 were male, and who accepted to participate in the study. Our samples consisted of medical secretaries, physicians, nurses, allied health personnel and caregivers. Our study is approved by Non-Invasive Clinical Studies Ethics Committee of Pamukkale University (03.03.2015/03). All participants filled out a Voluntary Approval Form before the study.

Our research was performed by applying the sociodemographic question forms consisting of questions such as age, gender, height, weight, marital status, family history, smoking and exercising habits of all participants within a two-month-long period. Point and annual prevalence was determined by questioning the presence of complaints within the last 7 days and 12 months, which is in the general section of Standardized Nordic Musculoskeletal Questionnaire.

Pain localized between the gluteal region and last rib, and felt in the dorsal region requiring therapy or persisting all day long for at least two weeks is considered as low back pain in our study.

Outcome measures

Assessment of pain

Pain level of participants was evaluated with the 10-cm-long Visual Analogue Scale (VAS). (0: no pain, 10: most severe pain). Also the duration of complaint, starting age of first low back pain, reporting sickness live due to pain, absenteeism from work within last year, the clinic applied for therapy and most common treatment method were questioned.

Assessment of occupational risk factors

Participants' professions, years of service, working types, daily working hours, times spent by standing and sitting, presence of breaks, times spent by using computer, load carriage situations and how much it is if present were questioned via the questionnaire method.

Assessment of psychosocial risk factors

Stress levels of participants were evaluated with "Perceived Stress Scale". Reliability study of this scale was performed by Örücü et al. in 2009. Participants are asked to mark the most appropriate option in the questionnaire consisting of 10 questions. 5 point likert scale is used in the scoring where "0=none, 4=very often". 4 positive subjects are reversed and scored in the scale. Total score is between 0 and 40 points. High score indicates that stress is high.[14]

Job Satisfaction Scale was used to evaluate the job satisfaction of participants. This scale was developed to determine the job satisfaction levels of individuals. There are 10 questions with 4 options in the scale. Participants are asked to mark the option reflecting

their situation the best. Answers to the questions in the scale are scored between 1 and 4. Lowest point to get from the scale is 10, highest point is 40. Low points indicate the job dissatisfaction.[15]

Statistical analysis

A statistical software package (SPSS 21.0, Chicago, IL) was used to perform all analyses. Continuous and categorical data are reported as mean±standard deviation and number (percentages), respectively. To determine risk factors of low back pain, the binary logistic regression method was used. Independent groups were statistically analyzed by using the Independent Samples t-test, Mann Whitney U test and Chi-square test. Statistical significance was set at $p<0.05$.

Results

188 medical secretaries, 764 nurses, 215 physicians, 238 allied health personnel and 277 caregiver participated in the study. 1010 of 1682 employees were female and 672 of them were male. Age average was 37.9±7.46 years and average working years was 16.29±8.26 years (Table 1). Lifetime low back pain prevalence was 53%, annual prevalence was 39% and point prevalence was 29.5% among healthcare professionals (Figure 1). It was determined that the profession with the highest prevalence was medical secretarial (56.9%).

52.8% of participants had mild pain within the last year whereas acute pain level was 5.92 cm and chronic pain level was 5.45 cm (Table 2). Pain level was high between ages 36–45 in women and between ages 46–55 in men (Figure 2). Average complaint duration of participants with low back pain was 36.39 + 37.2 months, age of first low back pain incidence was found as 31.7 + 6.32 years. 33% of the participants suffering from low back pain got sickness live due to pain. Among hospital employees, most consulted clinic was the physiotherapy clinic and the most common treatment was drug therapy (Table 2).

When individual risk factors were examined, it was determined that elder age, female gender (p=0.041), high body-mass index (BMI) (p=0.002), being married (p=0.0001) and lack of exercising habit (p=0.009) increased the low back pain risk (Table 3).

Working for more than 4 hours by standing (p=0.012) and sitting (p=0.021), using computer for more than 4 hours (p=0.0001) and increased years of service (p=0.003) affect the risk of having low back pain significantly as the occupational risk factors of low back pain. In our study, it has been determined that the ones working for 4–8 hours by standing have 0.145 times more risk and the ones working for more than 8 hours by standing has 0.185 times more risk when compared to the ones working for less than 4 hours by standing. The ones working for 4–8 hours by sitting has 4.7 times more risk when compared to the ones working for less than 4 hours by sitting. Each 1 unit increase in years of service increases the risk of low back pain by 0.93 times, whereas low back pain risk in people using computer for more than 4 hours is 0.005 times more.

When the effects of stress and job satisfaction on low back pain are examined as psychosocial risk factors, there is a meaningful relation determined between low job satisfaction and low back pain (p=0.001). 1 unit decrease in job satisfaction score increases the low back pain risk by 1.11 times (Table 3).

Discussion

Low back pain, ranked as second among the diseases causing workforce loss in developed countries, is the most important factor affecting the production loss. Occupational low back pain developed as a result of exposure to factors such as heavy lifting, working by bending forwards, using the waist and body in wrong positions, and improper working conditions is a common cause of injury.[16] It is considered that the low back pain is more frequent today as a result of decreased body movements despite the spread of technology.[17] Because of this, research on low back pain frequency and risk factors has an important place in preventing low back pain. Hospital employees encounter more occupational health problems than other professionals, and the most common of them is low back pain.[7] Our study is planned for the purpose of examining the personal, occupational and psychosocial risk factors affecting the low back pain prevalence of healthcare workers at Denizli State Hospital.

In our study, lifetime low back pain prevalence of healthcare workers was determined as 53% and

Table 1. Demographics and clinic data of the participants by groups

Characteristics	Group I Low back pain (n=892)		Group II No low back pain (n=790)		p*
	Mean±SD		Mean±SD		
Age (year)	39.39±6.75		36.13±7.82		0.0001
BMI (kg/cm^2)	25.47±2.81		24.88±3.10		0.0001
Working year	17.76±7.66		14.62±8.58		0.0001
Daily working hours	8.70±1.34		8.75±1.55		NS**
Standing working time	5.54±2.68		5.59±2.88		NS**
Sitting on working time	3.61±2.16		3.54±2.22		NS**
Computer usage (h)	2.95±2.25		2.88±2.48		0.002
PSS score	22.19±5.63		20.00±6.26		0.0001
JSS score	15.28±2.46		16.41±3.17		0.0001
	n	%	n	%	p[a]
Gender					NS
Male	341	38.2	331	41.9	
Female	551	61.8	459	58.1	
Occupation					NS
Physician	116	13	99	12.5	
Nurse	407	45.6	357	45.2	
Medical secretary	107	12	81	10.3	
Allied health staff	128	14.4	110	14	
Caregiver	134	15	143	18	
Marital status					0.0001
Never married	192	21.5	195	24.68	
Married	620	69.5	574	72.66	
Divorced	80	9.0	21	2.66	
Family history					0.028
Yes	565	63.3	459	58.1	
No	327	36.7	331	41.9	
Smoking habit					NS
Yes	366	41	355	44.9	
No	526	59	435	55.1	
Physical exercise					0.0001
Regular	241	27	284	35.9	
No exercise	651	73	506	64.1	
Rest break					NS
Yes	626	70.2	567	71.8	
No	266	29.8	223	28.2	
Load carrying					0.0001
Yes	360	40.4	185	23.4	
No	532	59.6	605	76.6	

SD: Standard deviation; PSS: Perceived Stress Scale; JSS: Job Satisfaction Scale; NS: Not significant; h: Hour; *Mann Whitney U Test; **t Test; [a]Chi Square Test

the annual prevalence was determined as 39% and point prevalence was determined as 29.5%. Low back pain prevalence is 76% in the Netherlands,[18] 70.9% in Kuwait,[19] 57.7% in Tunisia,[7] 46% in Ice-

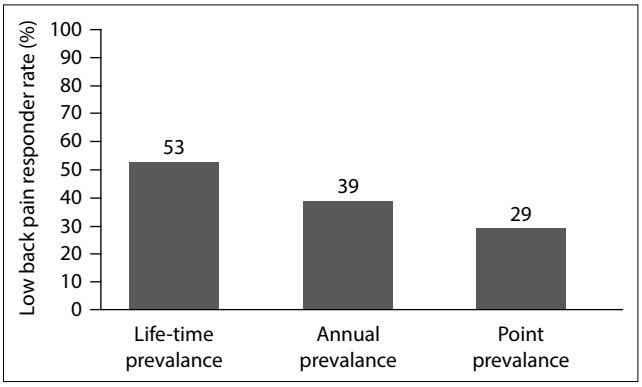

Figure 1. Life – time, annual and point prevalence of low back pain on health care workers.

land and Nigeria[20,21] and 38.9% in Hong Kong[22] in the literature. Altınel et al. found the lifetime low back pain prevalence as 47% and annual low back pain prevalence as 34.3% among 268 healthcare professionals.[23] In a study by Arasan et al. where they examined the low back pain frequency in 478 nurses working at a private hospital, lifetime low back pain prevalence was determined as 84% and point prevalence was determined as 63%.[24] Low back pain was determined among 39.9% of 163 nurses working at two different state hospitals in Bandırma.[25] Lifetime low back pain prevalence was 65.8% and annual prevalence was 61.3% among 1600 healthcare professionals.[17] Also, in the study where the relation between low back pain frequency and chronic fatigue syndrome was examined, frequency in the last 12 months was determined as 59.7%.[26] In our study, pain present between the gluteal region and last rib, and felt in the dorsal region requiring treatment or lasting all day long for at least two weeks was considered as low back pain. There are publications in the literature where mechanical pain in the low back region, pain radiating

Table 2. Pain characteristics and pain-related behaviors of the study sample

Pain characteristics	Total		Males		Females		p*
	n	%	n	%	n	%	
Number(current pain)	655		254	38.8	401	61.2	0.0001
Pain intensity							
Mild	109	16.6	59	9	50	7.6	
Moderate	346	52.8	142	21.7	204	31.1	
Severe	200	30.5	53	8.1	147	22.4	0.0001[a]
Acute pain intensity** (n=496)	5.92	1.74	5.19	1.64	5.64	1.85	0.001[a]
Chronic pain intensity** (n=655)	5.45	1.78	5.55	1.58	6.14	1.79	0.0001[a]
Pain duration (month)**	36.39	37.25	37.99	39	35.39	36.12	NS
Onset of pain (age)**	31.71	6.72	32.43	5.13	31.25	6.91	0.0001[a]
Pain-related behaviors							
Get reported because of low back pain							
Yes	291	32.6	130	14.6	161	18	
No	601	67.4	211	23.7	390	43.7	0.0001
Referenced department							
Orthopedics	188	21.1	103	30.2	85	15.4	
Physical Therapy	381	42.7	129	37.8	252	45.7	
Neurosurgery	272	30.5	78	22.9	194	35.2	
No any department	51	5.7	31	9.1	20	3.6	0.0001
Treatment							
Medicine	529	59.3	203	59.5	326	59.2	
Physiotherapy	266	25.3	91	26.7	135	24.5	
Surgery	54	6.1	12	3.5	42	7.6	
No treatment	83	9.3	35	10.3	48	8.7	NS

NS: Not significant; *Chi - Square test; **Mean (SD); [a]Mann-Whitney U test.

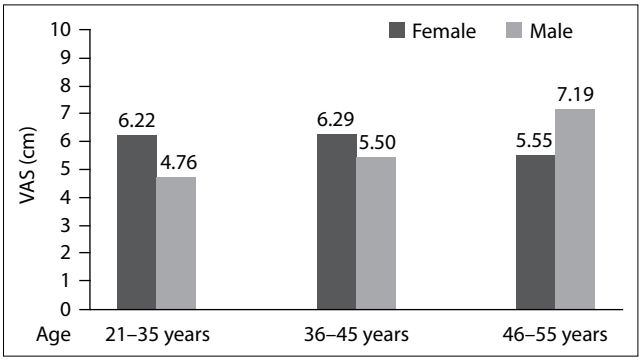

Figure 2. The relation between age and pain intensity.

Table 3. Results from regression model of risk factors for low back pain

	p	OR(Exp B)	95% CI
Individual risk factors			
Gender	0.041*	1.2	1.00–1.52
Body mass index	0.002*	0.9	0.91–0.98
Marital status	0.000*	0.2	0.16–0.44
Smoking habit	0.311	0.8	0.72–1.10
Physical exercise	0.009*	0.7	0.59–0.92
Workplace risk factors			
Working time	0.003*	0.9	0.90–0.97
Daily working hours	0.350	1.0	0.92–1.24
Standing working time	0.012*	0.1	0.03–0.65
Sitting on working time	0.021*	4.7	1.25–17.64
Computer use	0.0001*	0.0	0.00–0.04
Load carrying	0.553	1.2	0.63–2.31
Psychosocial risk factors			
Higher job satisfaction	0.001*	1.1	1.04–1.18
Workplace stress	0.142	0.9	0.95–1.00

OR: Odds ratio; CI: Confidence interval; *p<0.05.

through hips and legs was considered as low back pain.[23,27–29] These differences in the prevalence values can be associated with the definition of low back pain.

When the low back pain frequency was evaluated based on occupational groups, it was witnessed that the riskiest occupational group consisted of nurses.[10,23,28–30] In the study of Terzi et al. it was determined that the occupational group encountering low back pain the most consisted of medical secretaries.[26] In our study, low back pain was mostly witnessed among medical secretaries (56.9%). The fact that the participation of medical secretaries was higher and professionally they work for longer periods of time by sitting explains why low back pain was witnessed in higher ratios than other occupational groups.

There are different results on individual risk factors in the literature. Altınel et al. noted that smoking and family history were risk factors for low back pain.[23] In a study performed on operating room nurses in Saudi Arabia there wasn't any relation determined between pain level and age, gender, smoking habit, BMI.[28] In the study by Wong et al. where they examined the risk factors among healthcare professionals working at different hospitals, there wasn't any meaningful relation determined between individual risk factors and low back pain.[29] In the study where risk factors among hospital employees were evaluated with the non-parametric approach, it was witnessed that height, weight, gender and extra professional activities increased the frequency of low back pain.[16] According to Karahan et al., age, female gender and smoking habit are among risk factors.[17] İlhan et al. examined the relation between age and low back pain prevalence; and they reported that low back pain was 1.95 times more in age group 25–34, 3.32 times more in age group 35–44, 3.31 times more in age group 44–55 when age group 15–24 was used as a reference.[31] When individual risk factors were examined in our study, it was determined that elder age, female gender, high BMI, being married and lack of exercising habit increased the risk of low back pain.

According to Altınel et al. when occupational risk factors were examined, the unit worked at, working duration and working shifts weren't effective, whereas there were differences in terms of occupational tasks.[23] There wasn't any meaningful relation witnessed between occupation type and service year, and low back pain.[28] Wong et al. reported that professional category, faulty posture, heavy lifting were risk factors among healthcare professionals working at different hospitals.[29] In another study, it was determined that occupation, daily working hours, working time by standing and sitting were determined as risk factors.[16] In Sweden, working environment with bad lighting and ventilation, maintaining the same position for a long time, load carrying and working for more than 8 hours a day were found as risk factors for low back pain among university hospital employees.[30] Karahan et al. reported that occupational

group and load carrying increased the frequency of low back pain.[17] In our study, it was determined that working by standing and sitting for more than 4 hours, using computer for more than 4 hours and increased years of service affect the low back pain risk significantly.

High job demands and low job satisfaction were demonstrated as psychosocial risk factors as a result of Meta Analysis studies in literature.[32] In the study where Perceived Stress Scale and Job Content Questionnaire were used, it was emphasized that arrangements should be considered for personal and psychosocial factors in addition to arrangements for occupational factors.[33] In another study, depression and limitation were determined as independent risk factors.[10] Even though prevention and protection strategies for nurses in the working environment are addressed to ergonomic risk factors, it was noted that improving psychosocial work environment might have the effect of decreasing musculoskeletal disorders.[34] We have determined a meaningful relation between low job satisfaction and low back pain.

This study has demonstrated that lifetime low back pain prevalence of healthcare workers was 53%, annual prevalence was 39% and point prevalence was 29.5%. The occupation with most frequent low back pain was determined as the medical secretarial (56.9%). When risk factors were examined, we have determined a meaningful relation between low back pain and elder age, female gender, high Body Mass Index (BMI), being married and lack of exercise habit, working for more than 4 hours by standing and sitting, using computer for more than 4 hours, increased years of service and low job satisfaction.

Limitations

Limitations of our study were the unequal number of occupational groups and not determining the risk factors of different occupational groups.

Conclusions

Making necessary regulations regarding working in a constant position for a long time, building ergonomic working conditions, encouraging people towards exercise among hospital employees will contribute to decreasing the low back pain incidence ratio.

Acknowledgements

We thank for Denizli Government Hospital staff for help with participating in our study.

Conflict-of-interest issues regarding the authorship or article: None declared.

Peer-rewiew: Externally peer-reviewed.

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