MÜSBED 2015;5(4):215-219
DOI: 10.5455/musbed.20150831012038

Araştırma / Original Paper

The Factors That Correlated with Back Pain in Physiotherapists

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Kabul tarihi / Date of acceptance: 24 Haziran 2015 / June 24, 2015

ÖZET

Fizyoterapistlerde bel ağrısı ile ilişkili etkenler

Amaç: Fizyoterapistlerde mesleki yüklenmelere bağlı olarak bel ağrısı sıklıkla görülen bir durumdur. Bu çalışmanın amacı fizyoterapistlerde yaş, vücut kitle indeksi, çalışma postürü ve çalışma yılının bel ağrısı ile ilgili özürlülük düzeyi üzerine etkisini incelemektir.
Yöntem: Yirmi dokuz fizyoterapist çalışmaya dahil edildi. Çalışma yılı ve günlük çalışma saatleri kaydedildi. Olguların bel ağrısı ile ilgili şikâyetleri "Quebec Bel Ağrısı Kısıtlılık Ölçeği" (QUEBEC) ile, çalışma postürleri "Owako Çalışma Postürü Analiz Sistemi" (OWAS) ile değerlendirildi. Bel ağrısı ile yaş, vücut kitle indeksi (VKİ) , çalışma postürü, çalışma yılı ve günlük çalışma saati arasındaki ilişki Spearman korelasyon katsayısı kullanılarak incelendi. Bel ağrısı olan ve olmayan fizyoterapistlerin yaş, VKİ, çalışma yılı, günlük çalışma saati ve çalışma postürleri arasındaki fark Mann-Whitney U test ile değerlendirildi.
Bulgular: QUEBEC skoru ile yaş arasında pozitif yönde orta derecede istatistiksel olarak anlamlı ilişki bulundu (r=0.44, p=0.01). Çalışma yılı ile çalışma postürü (r=0.38, p=0.04) ve VKİ (r=0.41, p=0.027) arasında ilişki olduğu görüldü. Bel ağrısı olan ve olmayan fizyoterapistlerin yaşları istatistiksel olarak birbirinden farklı bulundu (p<0.05).
Sonuçlar: Çalışmamızda fizyoterapistlerde ilerleyen yaşın bel ağrısı ile ilgili özürlülük düzeyini etkilediği görüldü. Ayrıca çalışma yılı arttıkça çalışma postürünün bozulması ve VKİ'nin artmasının bel ağrısını tetikleyebilecek faktörler olduğu görüldü.
Anahtar sözcükler: Fizyoterapist, postür, bel ağrısı

ABSTRACT

The factors that correlated with back pain in physiotherapists

Objective: Depending on the occupational loading, back pain is frequently encountered in physiotherapists. The aim of this study was to investigate the correlation of age, body mass index (BMI), working posture and time with back pain in physiotherapists.
Methods: Twenty-nine physiotherapists were included to study. Working-years and daily-working hours were recorded. Complaints about back pain were assessed with "Quebec Back Pain Disability Scale" (QUEBEC), working posture with "Owako Working Posture Analyze System" (OWAS). The relation between back pain and age, "body mass index" (BMI), working posture, working time and daily-working hours were investigated by Spearman correlation coefficient. Mann-Whitney U test was used to set the differences in age, BMI, working posture, working-years and daily-working hours of the physiotherapists which were having back pain and having no pain.
Results: There were a statistically significant correlation between QUEBEC score and age (r=0.44, p=0.01). Working year was correlated with working posture (r=0.38, p=0.04) and BMI (r=0.41, p=0.027). There were a statistically significant difference between ages of physiotherapists which had back pain and which didn't have back pain (p<0.05).
Conclusions: The results of our study showed that age is related with back pain related disability in physiotherapists. Deterioration of working posture and BMI with aging may trigger back pain in physiotherapists.
Key words: Physiotherapist, posture, back pain

INTRODUCTION

Physiotherapists are considerably exposed to physical loading as a matter of course (1). As a result of these physical loadings, mostly back pain, then other parts of spine, hand, wrist pain and occupational injuries related with other extremities are frequently observed (2,3). It is known that among medical staff, back pain is observed due to occupational loadings frequently (4). Compared with other medical staff, there are fewer studies about back pain among physiotherapists and it is thought that the reason of this scarcity is that physiotherapists have information about body anatomy, biomechanics and physiology and know the methods of preventing, treating and controlling back pain (1,5).

It was observed that back pain complaints of physiotherapists due to occupational loading starts from student years (5). Ellis et al., (5) stated that 27 % of

senior students at physiotherapy department have back pain complaint following patient mobilization. Other researchers stated that complaints about back pain occur within four or five years of working life (6,7). While the rate of back pain incidence among physiotherapists vary between 57% and 73% during life time (8,9), it was stated that rate of back pain incidence in one year is 45% (2), rate of being exposed to any injury during life time is 90% (6).

Apart from lifting heavy goods; it was stated in literature that standing, walking or sitting more than two hours during day time and doing movements which contain body flexion or rotation increase spinal loading and are risk factors for back pain (10) while increased age (11) and increased "body mass index" (BMI) (12) apart from spinal loading are related with back pain. Working posture of physiotherapists includes most of the risk factors above and in addition to this it is thought that length of working hours increase exposition duration to spinal loading.

The aims of this study are (a) to analyze the differences in age, body mass index, working posture and working duration between physiotherapists who have back pain and who don't have back pain and (b) to investigate the relation of age, body mass index, working posture and working duration with disability level related with back pain in physiotherapists. The hypotheses of this study are that (a) age, body mass index, working posture and working duration are different between physiotherapists who have back pain and who don't have back pain and (b) age, body mass index, working posture and working duration are correlated with disability level related with back pain in physiotherapists.

METHODS

The study was carried out in 29 physiotherapists (23 females, 6 males) working actively. Physiotherapists who have any neurologic, rheumatologic disease, congenital or acquired deformities and who had surgical operation in the last 6 months and/or physiotherapy were excluded from the study. Demographic information of cases was recorded. Their working years and daily working hours were asked. Daily working hour was calculated by subtracting resting duration from daily working duration. Physiotherapists were interrogated about back pain. Physiotherapists who have back pain were included in group 1 (n=15, 13 females, 2 males); those who do not have were included in group 2 (n=14, 10 females, 4 males). Disability level of physiotherapists was evaluated with Quebec Back Pain Disability Scale (QUEBEC) (13,14). Working postures of all physiotherapists were evaluated with "Owako Working Postures Analysis System" (OWAS) (15) by an experienced physiotherapist during working hours of physiotherapists. The study was carried out according to principles of Helsinki Declaration and all participants signed informed consent form. The ethical commission of the Gazi University approved the study.

QUEBEC is a scale, which evaluates the difficulty of problems related with back pain in twenty different activities. Evaluation is carried with numerical scoring between 0 and 5. "0" value is scored as "no difficulty felt", "5" value is scored as "activity is not done" (13,14). Total score is recorded by adding up the scores of twenty activities.

OWAS is a system which was developed in order to evaluate bad posture resulting from working. It is a posture evaluation system based on observation and measuring how four postures for back, three postures for upper extremity and shoulders, seven postures for lower extremity and five different postures for head were used during working, also measuring factors related with protection duration of posture and load bearing. Working posture hazard level of person was analyzed under 4 categories during evaluation. These are "Category 1 (C1): Normal posture, does not require ergonomic arrangement", "Category 2 (C2): Not much stress, may require ergonomic arrangement in near future", "Category 3 (C3): too much loading and stress, requires ergonomic arrangement as soon as possible", "Category 4 (C4): far too much loading and stress, urgent ergonomic arrangement (15).

Statistical Analysis

Compatibility of data to normal distribution was evaluated with Kolmogorov-Smirnov test. The difference in distribution of genders between two groups was analyzed with the Chi-square test. The relation between back pain and age, body mass index (BMI), working posture, year and daily working hours was determined by using Spearman correlation coefficient including all subjects. The difference between age, BMI, working year,

daily working hours and working postures between Group 1 and 2 were evaluated with Mann-Whitney U test.

RESULTS

Socio-demographic characteristics of cases were given in Table 1. The distribution of the genders between two groups were not different from each other (p>0.05). According to OWAS, 34.5% of physiotherapists were grouped in category of "C1", 48.3% in "C2", 13.8% in "C3" and 3.4% in "C4" working posture. Quebec score of the group one was 18.40±15.57 (Mean±SD), group two was 0. While there was positive significant relation between QUEBEC score and age (r=0.44, p=0.001), there was no relation between other parameters and QUEBEC score (p<0.05) (Table 2). Correlation analysis also shows that there is positive statistically significant relation between working year and working posture (r=0.38, p=0.04) and working year and age and BMI (r=0.77, p<0.001; r=0.41, p=0.027) (Table 2). Ages of two groups were statistically different from each other (p<0.05), there was no difference in other parameters (p>0.05) (Table 3). It was found that physiotherapists with back pain are older and 75% of them are in 31-44 age ranges.

Table 1: Socio-demographic characteristics of the participants

	Mean±SD	Median	Minimum	Maximum
Age (year)	31.48±5.51	31	23	44
Height (cm)	165.66±5.57	165	150	177
Weight (kg)	61.93±11.35	59	30	85
Body Mass Index (kg/m²)	22.65±3.02	21.30	17.85	29.67
Working years	6.63±5.76	4.50	1	23
Daily working hours	6.75±0.87	8.00	4	9

SD: Standard deviation

Table 2: Correlation results of physiotherapists

		QUEBEC	OWAS	BMI	Age	Working years	Daily working hours
QUEBEC	r	1.000					
	p	.					
OWAS	r	0.03	1.00				
	p	0.85	.				
BMI	r	0.22	0.05	1.00			
	p	0.24	0.78	.			
Age	r	0.44(*)	0.19	0.33	1.00		
	p	0.01	0.30	0.07	.		
Working years	r	0.34	0.38(*)	0.41(*)	0.77(*)	1.00	
	p	0.07	0.04	0.027	<0.001	.	
Daily working hours	r	0.08	-0.25	-0.04	-0.18	-0.18	1.00
	p	0.65	0.19	0.83	0.33	0.36	.

QUEBEC: Quebec back pain disability index, OWAS: Owako working posture analysis system BMI: Body mass index, *Correlation is significant at the p value of 0.05.

Table 3: Comparison of the physiotherapists with and without back pain

	Group 1 (n=15) (Subjects with pain)				Group 2 (n=14) (Subjects without pain)				p
	Mean±SD	Median	Min.	Max.	Mean±SD	Median	Min.	Max.	
Age (years)	33.33±5.05	32.00	27	44	28.71±4.90	26.50	23	39	0.01*
BMI (kg/m²)	23.63±3.07	23.88	19.72	29.67	21.59±2.68	20.99	17.85	27,13	0.15
Working years	8.25±6.53	6.00	2	23	5.00±4.54	3.50	0.5	17	0.09
Daily working hours	8.10±0.54	8.00	7.5	10	8.07±0.62	8.00	7	10	0.98

BMI: Body mass index, SD: Standard deviation, *There is a significant difference between the groups (p<0.05).

DISCUSSION

In this study, which was planned with the aim of determining factors influencing back pain among physiotherapists, it was observed that age influenced back pain. Moreover, it was also observed that as the working year of physiotherapists increase they work in more dangerous working postures.

When the effects of aging on spinal structures are analyzed, it is seen that disc degeneration starts at the 2nd decade of life and continues accordingly with age (16). Radial ruptures can be observed in the 3rd or 4th decade together with loss of strength in connection between annulus fibrosus and nucleus fibrosus (17). It was also stated in the literature that together with the increase of age mechanic changes such as decrease of turgor pressure in disc, decrease of osmotic pressure of nucleus, changes in collagen network and decrease of disc height cause diffuse bulging and these should be separated from focal bulging or real herniations (17). Disc degeneration and decrease of disc height put facet joints under stress and cause cartilage degeneration and osteoarthritis. It is stated that nociceptive terminations in facet joint capsule, which was stimulated as a result of these changes, can cause back pain (17). Loss of property of elastin components in ligaments, osteophyte formation in osteoporosis and end-plate are other changes that can be related with back pain in increased age (18).

In a study carried out on physiotherapists in Slovenia, it was seen that 74.6% of physiotherapists who have back pain were in 31-50 age group (9). This study supports current literature in this sense and it was found that physiotherapists who have back pain in Turkey are older and 75% of them are above 31. While the changes mentioned above are indispensable together with aging, it was stated in literature that degenerate spine can be completely asymptomatic and keep its form (17). Therefore back pain increasing together with age among physiotherapists analyzed in this study should not be completely related with degenerative process. In our study it was observed that BMI increase with increasing age. It is thought to be one of the reasons of the increase of disability due to back pain, which occur together with aging. In previous studies, BMI of cases with disc degeneration was higher than those who do not have (19) and BMI increase has been related with facet joint pain and sacroiliac joint pain (20). Since problems related with disc degeneration, facet joint and sacroiliac joint are reasons of back pain (21) it is important to prevent putting on weight among physiotherapists due to aging and physiotherapist in this head should be given training.

It is known that physiotherapists have problems related with musculoskeletal system after activities such as patient transfer, keeping the same position for long period, repeated activities and carrying load (22) and working postures of physiotherapists pose risk factor for back pain (23). In our study there was no direct relation between working postures of physiotherapists and disability due to back pain, the reason may be that most of the physiotherapists evaluated in this study use less risky working postures during working. However as working year increases, it is seen that physiotherapists use more dangerous working postures together with the decrease of body flexibility and this can be affected from disability due to back pain together with increasing age. Therefore, specific protective behaviors should be developed in order to prevent spoiling of working posture together with increasing age. Squadroni and Barbini (23), suggested to use adjustable beds and ergonomic devices, work with a physiotherapy assistant if they work with seriously ill people, bedbound neurologic patients and also suggested the distribution of independent orthopedic patients to physiotherapists equally. It is thought that taking these measurements in physiotherapy services would decrease disability depending on back pain increasing with age among physiotherapists.

The small sample size is the one of the limitations of this study. Additionally we only used the OWAS method when assessing the working posture. OWAS method is not an angle specific evaluation for trunk posture. Other angle specific methods (such as rapid entire body assesment) may be used in further studies with high number of subjects. Additionally working posture may be affected from other factors (psychosocial factors etc.) and future studies should focus on these factors.

This study shows that back pain among physiotherapists is related with increased age. Moreover, it was observed that as the working year increase, BMI, which is evaluated as a risk factor for back pain increase,

and working posture spoil. Therefore, the importance of weight control and correct posture should be emphasized to decrease back pain among physiotherapists.

Moreover according to the results of this study it is clear that physiotherapists should apply their knowledge about ergonomics and correct posture however, improperness and inadequacies in working conditions may cause failures in applying this information. Therefore, considering the working years and exposure of physiotherapists both in the sense of working conditions and duration, our study emphasizes the need of personal rights of physiotherapists that should be reviewed. As a conclusion, the time schedule for the work should be revised according to the years to prevent future deterioration of the musculoskeletal system in physiotherapists.

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