Research Article
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Study of musculoskeletal disorders in physical therapists: correlation with work routine.

Estudo dos distúrbios musculoesqueléticos em fisioterapeutas: correlação com a rotina do trabalho.

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Abstract
Introduction: Work-Related Musculoskeletal Disorders (MSDs) affect health professionals by frequent exposure to physical and mental overloads during the workday. Physiotherapy aims to promote functional health of the individual, however ergonomic conditions in their workplace are often precarious and associated with activities and repetitive movements resisted overload the musculoskeletal system inducing damage to your physical condition. **Objective:** To identify the occurrence of Musculoskeletal Disorders (DMEs) in physical therapists working in public and private health services in Recife-Pernambuco, recording determinants and establishing relationship with clinical practice and the workload of the tests. **Method:** Observational study of physiotherapists of both genders. Peres questionnaire were administered and collected personal information, professional performance and DMEs **Results:** Forty-one physiotherapists; 85.4% reported DMEs, females (80.5%); 41.4% between 24-30 years old; places of work, hospitals (70.7%) and clinical (63.4%); predominance of lesions in the spine and upper limbs; 65.7% changed work habits due to the occurrence of DMEs. Significant correlation between age and gender prevalence in females; since the occurrence of DMEs was not significantly correlated with time of practice, with workload, with the number of daily visits nor to rest at work. **Conclusion:** The volunteers showed high percentage of involvement by DMEs, especially in the spine, which seems to be related to the age and gender of the therapist. The study indicates that physical therapists are an exposed to risk for developing occupational musculoskeletal disorders profession, requiring awareness of students and professionals about proper use of the body itself, the risks of the profession in order to prevent future physical limitations.
Keywords: Cumulative trauma disorders, occupational diseases, musculoskeletal system, physical therapy specialty, cross-sectional studies.

Resumo
Introdução: Distúrbios Osteomusculares Relacionados ao Trabalho (DORT) afetam profissionais de saúde pela frequente exposição a sobrecargas físicas e mentais durante a jornada de trabalho. A fisioterapia tem como objetivo promover saúde funcional do indivíduo, no entanto condições ergonômicas no seu próprio local de trabalho muitas vezes são precárias e que junto às atividades e movimentos resistidos repetitivos sobrecarregam o sistema musculoesquelético induzindo danos à sua condição física. **Objetivo:** Identificar a ocorrência de Distúrbios Musculoesqueléticos (DMEs) em fisioterapeutas que trabalhavam em serviços públicos e privados de saúde em Recife-Pernambuco, registrando fatores determinantes e estabelecendo relação com a prática clínica e com a carga de trabalho dos profissionais avaliados. **Método:** Estudo observacional com fisioterapeutas de ambos os gêneros. Aplicado questionário de Peres, coletadas informações pessoais, atuação profissional e DMEs. **Resultados:** 41 fisioterapeutas; 85,4% relataram DMEs, gênero feminino (80,5%); 41,4% entre 24-30 anos; locais de atuação, hospitais (70,7%) e clinicas (63,4%); predominância de lesão na coluna e membros superiores; 65,7% alteraram os hábitos de trabalho em função da ocorrência de DMEs. Significância entre a correlação de idade e gênero, prevalência no sexo feminino; já a ocorrência de DMEs não esteve significantemente correlacionada com tempo de atuação profissional, com carga horária, com número de atendimentos diários e nem com descanso no trabalho. **Conclusão:** Os voluntários apresentaram elevados percentuais de acometimento por DMEs, principalmente na coluna vertebral, o que parece estar relacionado ao gênero e idade do terapeuta. O estudo aponta que os fisioterapeutas constituem uma profissão exposta aos riscos para desenvolvimento de distúrbios musculoesqueléticos ocupacionais, havendo necessidade de conscientização dos discentes e profissionais sobre utilização adequada do próprio corpo, dos riscos da profissão com objetivo de prevenir futuras limitações físicas.
Descritores: Transtornos traumáticos cumulativos, doenças profissionais, sistema musculoesquelético, fisioterapia, estudos transversais.

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INTRODUCTION

The achievements made by man allowed his emancipation throughout history, however brought changes in daily life and also in professional routines, often contributing to the emergence of problems to worker health.[1,2]

The Work-Related Musculoskeletal Disorders (MSDs), formerly known as Repetitive Strain Injury (RSI), are the main problems of occupational health and public health in the world, accounting for almost 90% of absenteeism from work.[3,4]

MSDs occur in workers in a variety of activities,[3-6] generate different degrees of disabilities,[7] affect mainly the upper region of the musculoskeletal system, affecting tendons, muscles, fascia and ligaments, associated or isolated, with or without degeneration of tissues[4, 8-12] and a high incidence of neurological and spinal problems.[9,13,14] Among the causal factors are repetitive movements, posture, strength, speed, vibration, direction, pace of working conditions ergonomic and psychosocial factors.[7,8,11,15,16]

Health professionals are susceptible to MSDs, having seen frequent exposure to physical and mental overloads during the workday[16,17] studies with nurses and physiotherapists indicate disturbances mainly in the lumbar spine[8,19,20]; while for dentists, it was found a rate of 58% of complaints of pain in one or more regions of the upper body.[21,22]

Physiotherapy is a profession whose purpose is to promote the functional health of the individual, including their working environment, however ergonomic conditions in their own work are often precarious and adding to the activities and repetitive weathered movements that overburden the spine and the musculoskeletal system, inducing damage to your physical condition.[16,17,23,24] Given the above, the objective of this study was to identify the occurrence of musculoskeletal disorders (MSDs) in active physical therapists in public and private health services in the city Recife-Pernambuco, recording determinants of these disorders and establishing relationship with the practice of physical therapy as well, with the workload of the tests.

METHODS

This is an observational study with the participation of 41 physiotherapists, of both genders, aged between 24 and 60 years, who worked in public and private physiotherapy services in Recife - Pernambuco. Initially hospitals and physical therapy clinics were visited for the dissemination of the project with the directors, and those interested authorized the study among professionals.

The survey was conducted through a questionnaire, adapted from Peres (23), designed for physiotherapists, containing 19 questions, divided into 3 parts: I - personal data (name, gender, marital status, address, place of birth, height, weight); II - Professional Practice (place, time and area of expertise, workload, number of patients/day, rest at work, exercise of another professional activity, occurrence of events during routine work) and III - DMEs (presence, type, regions of the body affected, changes in work habits and others). In some questionnaire items was allowed the physiotherapist score more than one answer.

All study participants gave their written consent to participate by signing the Informed Consent (IC), according to Resolution 196/96 of the Conselho Nacional de Saúde (CNS). The study was approved by the Ethics Committee in Research of the Centro de Ciências da Saúde da Universidade Federal de Pernambuco (UFPE), Protocol number 191/2005/CCS/UFPE.

Comparative analysis of variables was performed using chi-square test, being statistically significant differences those with $p < 0.05$; the results were presented in tables and graphs. The software used was BioEstat version 3.0.

Table 1. Distribution of individuals according to gender, age, job location and professional practice area.

Variables	Frequency	%N
Gender		
Male	8	19.5
Female	33	80.5
Age (years)		
24 - 30	17	41.4
31 - 40	12	29.3
41 - 50	7	17.1
≥ 50	5	12.2
Job location		
Clinics	29	70.7
Hospital	26	63.4
Home Care	21	51.2
Professor	6	14.6
Sports center	1	2.4
Healthcare institution	1	2.4
Others	2	4.9
Professional practice area		
Trauma and orthopedics	33	84.6
Rheumatology	19	48.7
Neurology	18	46.2
Cardiorrespiratory	8	20.5
Hydrotherapy	6	15.4
Manual therapy	6	15.4
Geriatrics	3	7.7
Vascular	3	7.7
Burned	1	2.6
Pediatrics	1	2.6
Public Health	1	2.6
TOTAL	**35**	**100**

Frequency corresponds to the absolute number of physiotherapists % and the relative N value of the sample size (n=41).

RESULTS

The sample consisted of 41 physical therapists, of which 85.4% showed the occurrence of DMEs. Table 1 shows that the majority were female, 80.5% (n = 33), as the age distribution, 70.7% of subjects were in the age group up to 40 years, with higher prevalence between 24 and 30 years with 41.4% of cases.

The main job location of physiotherapists were hospitals (70.7%) and clinical (63.4%), working mostly in the area of trauma and orthopedics (84.6%); 10% in the areas of geriatrics, vascular, burns, pediatrics and public health. These items of the questionnaire participants were allowed to choose more than one option, with respect to the distribution by area only 1 questionnaire showed no response. In individuals who reported the presence of DMEs, we investigated the most affected anatomical regions and the disorders were observed in the spinal column and upper limbs, especially the cervical spine with 62.9% (Figure 1).

Figure 2 shows the movements and positions most often carried out by physiotherapists during working; and over 80% of these professionals mentioned the repetitive movements of the upper limbs, partial or total trunk flexion standing, partial or full flexion of the cervical, use of manual techniques and dynamic posture for prolonged standing time.

Of the 35 physical therapists affected by DMEs, 65.7% reported having changed work habits due to the occurrence of disturbances. Much of professionals, 48.6% reported spending the best use body mechanics during professional practice (Figure 3).

Correlating the presence of DMEs with age and gender, there were significant ($p < 0.05$) and prevalence of DMEs in females. However, there was no association with age, but there was a higher prevalence (68.6%) of DMEs aged up to 40 years. The incidence of DMEs in physiotherapists was not significantly correlated with the time of practice, with the workload, with the number of daily visits and not with the rest at work (Table 2).

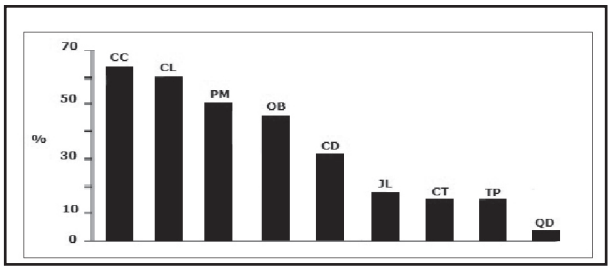

Figure 1. Anatomical regions affected by musculo-skeletal disorders (n= 35).
CC: Cervical spine; CL: lumbar spine; PM: wrist and hand; OB: shoulders; CD: dorsal column; JL: knee; CT: elbow; TP: ankle and foot; QD: hip.

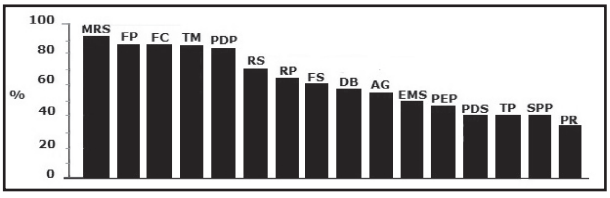

Figure 2. Distribution of movements and postures performed by individuals suffering from musculoskeletal disorders at work. MRS: repetitive movements of the upper limb; FP: bending standing; FC: cervical flexion; TM: manual techniques; PDP: dynamic posture for prolonged periods standing; RS: rotation sitting; RP: rotation of foot; FS: bending sitting; DB: ambulation; AG: crouch; EMS: elevation of the upper limb; PEP: static posture for prolonged periods standing; PDS: dynamic sitting posture for prolonged periods; TP: transfer of the patient; SPP: weight-bearing standing; PR: restricted position.

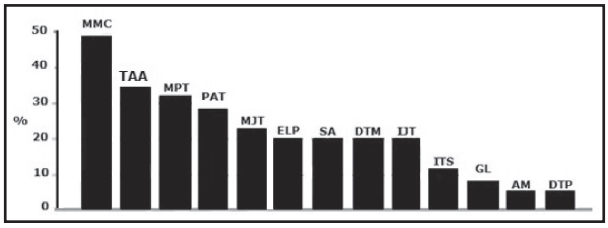

Figure 3. Frequency distribution of changes in work habits (n = 35).
MMC: best use of body mechanics; TAA: guidance techniques for self care; MPT: change of position at work; PAT: physical activity practice; MJT: change of working hours; ELP: avoid weight lifting; SA: request for assistance; DTM: decrease of manual techniques; IJT: breaks during the workday; STI: work stoppage when symptoms arise; GL: gymnastics; AM: mechanical aid; DTP: decreased time of patient care.

DISCUSSION

It was observed in the present study an occurrence of 85.4% of DMEs during the time of practice in physical therapists, which corroborates with the results found in the literature[17,18] and this result may be related to the physical and mental burden which these professionals are exposed in the workplace.[5,18]

Activities that require bending forward, trunk rotation with load-bearing, used routinely in the practice of physical therapy (transfer dependent patients, assistance during ambulation, maintenance of static and dynamic postures for prolonged time), but also with resistance movements (manual, mechanical) and repetitive upper limb, often overwhelm the spine and the musculoskeletal system inducing damage to your physical condition.[16,17,23-25]

These lesions were found in this study with high occurrence of DMEs in the spine, especially the cervical and lumbar region. It is observed in similar surveys low back pain in 62%-65% of the therapists assessed, ranging up to 51.28% in the cervical spine.[22,23] Researchers[26] investigated 928 physiotherapists of which 61% reported musculoskeletal disorders with prevalence in the lumbar region (45%), dorsal region (28.7%) and neck (24.7%).

The high prevalence of impaired cervical spine found in the present study may be related to the frequency of movements and postures of the cervical flexion, as well as partial or total trunk flexion foot and may also be related to the presence of DMEs in the region lumbar. Studies infer that these biomechanical

Table 2. Prevalence of musculoskeletal disorders according to gender, age, time of performance, workload, number of daily visits and rest at work.

Presence of Musculoskeletal Disorders						
	Yes		No		x^2	p
	N	%	N	%		
Gender						
Male	5	14.3	3	50	**4.16**	**0.041(*)**
Female	30	85.7	3	50		
Age						
24-30	12	34.3	5	83.3		
31-40	12	34.3	0	0	**6.34**	**0.096**
41-50	7	20	0	0		
≥50	4	11.4	1	16.7		
Time of performance (years)						
≤ 5						
6-10	13	37.1	5	83.3	**5.09**	**0.0165**
11-20	6	17.1	0	0		
≥20	9	25.7	0	0		
	7	20	1	16.7		
Worload (hours)						
≤ 6						
7-12	12	34.3	3	50	**1.84**	**0.399**
≥12	21	60	2	33.3		
	2	5.7	1	16.7		
Number of daily visits (num.)						
1-10	1	2.9	0	0		
11-20	18	51.4	1	16.7	**3.11**	**0.375**
21-30	11	31.4	3	50		
≥30	5	14.3	2	33.3		
Rest at word						
Sim	12	34.3	2	33.3	**0.002**	**0.964**
Não	23	65.7	4	66.7		
TOTAL		35	100	6	100	

N: number of physiotherapists; %: percentage relative to the number of individuals; x^2: chi-square test; (*): statistically significant ($p<0.05$).

changes serve and represent risk factors for the development of musculoskeletal injuries.[1,27,28]

Many professionals affected by DMEs in this research reported having changed their routine work in response to disturbances presented in an attempt to make better use of body mechanics, this initiative also observed in other studies of physiotherapists.[13,17,29,30]

Another important finding in this study is the significant relationship between gender of the therapist and the presence of DMEs, corroborating studies found in the literature[17,19,23] in which researchers demonstrated that female therapists are more likely to develop musculoskeletal disorders the male. This may be due to the fact that women demonstrated generally lower weight and height than men, thus generating physical disadvantages in some practices of physical therapy[23,26] or may be due to the predominance of physiotherapists females in our data.

Several authors point out that the age and time of practice are prevalent risk factors for the development of DMEs and physiotherapists in the first episode occurs before age 30, and older physiotherapists have a lower prevalence of these disorders, they are those who develop more strategies to adapt the physical demands of the job.[12,14,26] This has been confirmed by this study in which there was a higher occurrence of DMEs in physiotherapists aged up to 40 years, however it was not found no statistically significant difference between age and presence of DMEs.

In relation to the time of performance, workload, number of daily visits and rest at work, incidence of back pain and number of years of experience of the physiotherapist no correlation was seen in the occurrence of DMEs in physiotherapists surveyed, similar results was found by other researchers.[17,30]

CONCLUSION

Volunteers showed high percentage of involvement by DMEs, especially in the spine, which seems to be related to age and gender of the therapist.

The study indicates that physical therapists are exposed to one risk for developing occupational musculoskeletal disorders profession, requiring awareness of students and professionals about proper use of the body itself, the risks of the profession in order to prevent future physical limitations.

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