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ORIGINAL ARTICLE

Association of clinical diagnosis with occupational situation of patients of a physical therapy service

Associação do diagnóstico clínico com a situação ocupacional de usuários de um serviço de fisioterapia

Asociación del diagnóstico clínico con situación laboral de usuarios de servicio de fisioterapia

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ABSTRACT | Multiple causes of work-related lesions are little explored in Physical Therapy and its understanding based on the Epidemiologic and Technical Security System Nexus (NTEP) may provide physical therapists conditions for them to act in work processes. We aimed to analyze the association between clinical diagnosis and occupational situation of patients from a Physical Therapy service. This is a descriptive, cross-sectional study with 656 patients assisted from January 2013 to July 2014. We collected, from medical records, information about sex, age, skin color, clinical diagnosis and occupational situation. Chi-square and logistic regression tests were used for the analysis of the association between diagnosis and occupational situations. A population with mean age of 49.4 years, mostly women, white skin color and predominance of non-traumatic lesions. Multiple regression showed association between domestic services and carpal tunnel syndrome (OR=2.54) and shoulder injuries (OR=1.82); between construction services and pain in the spine (OR=5.78) and distal fractures in the lower limb (OR=3.53); between retirees and gonoarthrosis (OR=3.76), osteoarthritis in the spine (OR=2.24), and CVA (OR=2.03), shoulder injuries (OR=0.27) and distal fractures in the lower limb (OR=0.15). Our study showed risk for lesions of upper limbs in domestic services; for lesions of the spine and distal fractures of lower limbs in construction services; for arthrosis and CVA in retirees. Retirees feature a protection factor for shoulder injuries and fractures of lower limbs. Physical therapists can work in the selection of epidemiological indicators, formulation of ergonomic guidelines and planning of the therapeutic conduct.

Keywords | Occupational Health; Physical Therapy Modalities; Occupational Risks.

RESUMO | A multicausalidade nas lesões relacionadas ao trabalho (LER) é pouco explorada na fisioterapia e sua compreensão baseada no Nexo Técnico Epidemiológico Previdenciário (NTEP) pode fornecer ao fisioterapeuta condição de atuar nos processos do trabalho. O objetivo foi analisar a associação entre diagnóstico clínico e situação ocupacional de usuários de serviço de fisioterapia. Em estudo descritivo transversal, com 656 usuários atendidos de janeiro de 2013 a julho de 2014, foram coletadas de prontuários informações sobre sexo, idade, cor da pele, diagnóstico clínico e situação ocupacional. Testes qui-quadrado e regressão logística foram utilizados para análise da associação entre diagnósticos e situações ocupacionais em população com idade média de 49,4 anos, maioria mulheres, cor branca e predominância de lesões não traumáticas. A regressão múltipla mostrou associação entre serviços domésticos e síndrome do túnel do carpo (*odds ratio* ou OR=2,54) e lesões no ombro (OR=1,82); entre trabalho na construção civil e algias na coluna (OR=5,78) e fraturas distais de membros inferiores (OR=3,53); e entre aposentados e gonartrose (OR=3,76), artrose na coluna (OR=2,24), acidente vascular encefálico (AVE) (OR=2,03), lesões no ombro (OR=0,27) e fraturas distais

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de membros inferiores (OR=0,15). O estudo mostrou risco para lesões de membros superiores em serviços domésticos; para lesões na coluna vertebral e fraturas distais de membro inferior na construção civil; e para artroses e AVE em aposentados. Estes apresentaram fator de proteção para lesões de ombro e fraturas de membros inferiores. A atuação fisioterapêutica pode ser ampliada com conhecimento do nexo causal. O fisioterapeuta pode atuar em seleção de indicadores epidemiológicos, formulação de orientações ergonômicas e elaboração de conduta terapêutica.

Descritores | Saúde do Trabalhador; Modalidades de Fisioterapia; Risco Ocupacional.

RESUMEN | La multicausalidad en lesiones relacionadas al trabalho (Ler) es poco explorada en fisioterapia y su comprehensión basada en el Nexo Técnico Epidemiológico Previdenciário (NTEP) puede proporcionar al fisioterapeuta condición de actuar en los procesos de trabajo. El objectivo fue analizar la asociación entre diagnóstico clínico y situación laboral de usuarios de servicio de fisioterapia. En estudio descritivo transversal, fueron recogidas informaciones de los prontuários de 656 usuarios atendidos de enero de 2013 a julio de 2014, como sexo, edad, color de la piel, diagnóstico clínico y situación laboral. Pruebas chi-cuadrado y regresión logística fueron utilizadas para análisis de la asociación entre diagnósticos y situaciones laborales en población con edad media de 49,4 años, mayoría mujeres, color blanco y predominancia de lesiones no traumáticas. La regresión múltiple mostró asociación entre servicios domésticos y síndrome de túnel del carpo (*odds ratio* o OR=2,54) y lesiones en el hombro (OR=1,82); entre trabajo en la construcción civil y algias en la columna (OR=5,78) y fracturas distales de miembros inferiores (OR=3,53); y entre jubilados gonartrose (OR=3,76), artrose en la columna (OR=2,24), accidente cerebrovascular (ACV) (OR=2,03), lesiones en el hombro (OR=0,27) y fracturas distales de miembros inferiores (OR=0,15). El estudio mostró riesgo para lesiones de miembros superiores en servicios domésticos; para lesiones en la columna vertebral y fracturas distales de miembro inferior en la construcción civil; y para artroses y ACV en jubilados. Jubilados presentaron factor de protección para lesiones de hombro y fracturas de miembros inferiores. La actuación fisioterapéutica puede ser ampliada con conocimiento del nexo causal. Lo fisioterapeuta puede actuar en selección de indicadores epidemiológicos, formulación de orientaciones ergonómicas y elaboración de conducta terapéutica.

Palabras clave | Salud del Trabajador; Modalidades de Fisioterapia; Riesgo Laboral.

INTRODUCTION

The role of Physical Therapy in the Brazilian Unified Health System (SUS) shows that there are spaces to expand the coverage and resolution of its actions, especially when we refer to healthcare services to workers[1,2].

The complexity and multiple causes of the harms to health are still little explored in Physical Therapy as a result of the professional practice that, historically, focused on biological aspects and on rehabilitation, neglecting the knowledge on the process that caused the lesion[2,3].

In Brazil, one of the major causes of outpatient medical consultations are musculoskeletal complaints, influenced by work overload, which determine a large part of the demands on Physical Therapy[4,5].

In the context of occupational health, the instrument used to record and control notifications is the Work Accident Notification (*Comunicação de Acidente de Trabalho* – CAT), which records the harms suffered by workers and allows the characterization of the relation with work by Social Security, providing legal leave of workers for them to recover their health. However, to not report CAT causes undernotification of work accidents[5-8].

Aiming to interfere with the undernotification, the Social Security created law 11,430/06, regulated by Decree No. 6,042, pointing the Epidemiologic and Technical Security System Nexus (*Nexo Técnico Epidemiológico Previdenciário* – NTEP), which is the relationship between National Classification of Economic Activities (CNAE) and CID-10[9]. Through this nexus, we conclude that belonging to a given professional segment constitutes a risk factor for the worker to have a disease[8,10], and during the therapeutic process the physical therapist can identify relations between illness and lesions.

Therefore, when assisting the worker, physical therapists cannot diminished their historical and sociodemographic contexts, and they should act and intervene in the organization of work, contributing, more effectively, to identify problems related to the occupational activity and prevention of recurrences.

Focusing on the health-disease process of workers, the objective of this study was to analyze the association between the clinical diagnosis with the occupational situation of patients of a Physical Therapy service in the city of Presidente Prudente-SP, Brazil.

METHODOLOGY

This is a descriptive, cross-sectional study. Participants consisted of 656 patients assisted at *Centro Municipal de Reabilitação e Fisioterapia* (Municipal Rehabilitation and Physical Therapy Center – CRF) of Presidente Prudente/SP, Brazil.

The inclusion criterion was: patients evaluated at the CRF between January 2013 and July 2014. Data collected from medical records were: sex, age, self-reported skin color, clinical diagnosis, occupational situation and specialty in which the patient has been assisted (orthopedic or neurological physical therapy). The clinical diagnosis of doctors was described according to the International Classification of Diseases (ICD-10)[11]. Were considered for the analysis only medical records containing all this information, therefore, exclusion criteria comprised: incomplete records and those out of the established period.

Data analysis was exploratory, processed in the STATA IC 11.0 program (Stata Corporation, CollegeStation, TX). Were performed analyses to characterize the studied population, to identify major lesions and most frequent occupational status. Association between lesion and occupational situation was conducted by bivariate analysis (Chi-square test). Was used univariate and multivariate logistic regression model, estimating the odds ratio (OR) as a measure of association between variables and their respective confidence intervals (95%CI), controlling for the effects skin color, sex and age group, with a significance level of 95%.

RESULTS

Table 1 shows that the average age of the participants was 49.4±17.6 years with most (59.2%) female and 414 (63.1%) participants between 20 and 59 years old. Regarding data of clinical diagnosis after classification according to ICD-10, we identified that non-traumatic lesions of different natures (categories G, I, M) were prevalent (47,7%), while traumatic lesions, characterized by fractures (category S), showed prevalence of 18,5%.

Table 1. Description of the sample and major lesions (ICD-10)

Variables	No.	%
Sex		
Female	388	59.9
Male	268	40.1
Age Group		
<20 years	40	6.1
≥20 and ≤39	136	20.7
≥40 and ≤59	278	42.4
≥60	202	30.8
Skin Color		
White	428	65.2
Black	36	5.5
Mixed race	107	16.3
Yellow	2	0.3
Did not declare	83	12.7
Specialty		
Orthopedics	586	89.4
Neurology	69	10.6
Lesion – ICD-10		
Carpal tunnel syndrome (G56) G56	31	4.7
CVA sequelae (I69)	38	5.8
Gonoarthrosis (M17)	36	5.5
Osteoarthritis in the spine (M47)	47	7.2
Spinal herniated disc (M51)	37	5.6
Pain in the spine (M54)	64	9.8
Shoulder injuries (M75)	60	9.2
Fracture of shoulder and arm (S42)	26	3.9
Fracture of forearm (S52)	30	4.6
Fracture of wrist and hand (S62)	25	3.8
Distal fracture of lower limb (S82)	41	6.2
Other lesions#	221	33.7

#lesions with <3% occurrence
Source: CRF database 2013/2014

Considering the relationship between lesion and occupational situation, we analyzed the main situations and their distribution regarding sex, age group, skin color and referral specialty, as shown in Table 2. The data obtained indicated that six occupational situations occurred more frequently. The other situations, with occurrence less than 3%, were grouped and accounted for 44.5% of the total, and for being fragmented, were not considered in the risk analysis.

Table 2. Distribution per sex, age group, skin color and specialty according to occupational situation

	Domestic Services (N=147) 22.41%		Retiree (N=102) 15.55%		General Services (N=44) 6.71%		Student (N=36) 5.49%		Civil Construction (N=23) 3.51%		Driver (N=23) 3.51%		Others (N=291) 44.51%	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Sex														
Female	146	99.32%	60	58.82%	26	59.09%	15	41.67%	0	–	3	13.04%	142	48.97%
Male	1	0.68%	42	41.18%	18	40.91%	21	58.33%	23	100%	20	86.96%	149	51.03%
Age Group														
<20 years	0	–	0	–	0	–	32	88.89%	0	–	0	–	8	2.74%
≥20 and ≤39	18	12.24%	0	–	12	27.27%	4	11.11%	4	17.39%	1	4.35%	97	33.22%
≥40 and ≤59	78	53.06%	10	9.80%	24	54.55%	0	0.00%	14	60.87%	13	56.52%	138	47.60%
≥60	47	31.97%	92	90.20%	6	13.64%	0	0.00%	2	8.70%	7	30.43%	48	16.44%
Skin Color														
White	99	67.35%	68	66,67%	26	59.09%	23	63.89%	10	43.48%	12	52.17%	190	65,07%
Black	11	7.48%	8	7.84%	5	11.36%	0	0.00%	0	0.00%	11	47.83%	11	3.77%
Mixed race	20	13.61%	13	12.75%	5	11.36%	6	16.67%	7	30.43%	4	17.39%	51	17.81%
Yellow	0	–	1	0.98%	0	–	0	–	0	–	0	–	1	0.34%
Specialty														
Orthopedics	134	91.16%	83	81.37%	39	88.64%	33	91.67%	19	82.61%	21	91.30%	256	87.67%
Neurology	9	6.12%	19	18.63%	3	6.82%	1	2.78%	1	4.35%	0	–	35	12.33%

#lesions with <3% occurrence.
Source: CRF database 2013/2014

Table 3 describes the relation of occupational situation with lesions, associating three situations with different lesions (p<0.050).

Logistic regression presented in Table 4 shows the risk of particular occupational situation developing lesion in relation to other situations. In the multivariate analysis for domestic services we could not adjust it for sex, because only one individual was a man. For retirees, the adjustment was made only by sex and ethnicity, since the vast majority of individuals belonged to the age group above 60 years.

Table 3. Absolute and relative frequency of lesions (ICD-10) according to the main occupational situations

	Carpal tunnel syndrome (G56)	CVA sequelae (I69)	Gonoarthrosis (M17)	Osteoarthritis in the spine (M47)	Spinal herniated disc (M51)	Pain in the spine (M54)	Shoulder injuries (M75)	Fracture of shoulder and arm (S42)	Fracture of forearm (S52)	Fracture of wrist and hand (S62)	Distal fracture of lower limb (S82)
Domestic services (n=147)	13 (8,84%)*	9 (6,12%)	12 (8,16%)	16 (10,88%)	9 (6,12%)	19 (12,93%)	23 (15,65%)*	2 (1,36%)	7 (4,76%)	3 (2,04%)	6 (4,08%)
Civil construction (n=23)	0 (0,0%)	2 (8,7%)	2 (8,7%)	1 (4,35%)	0 (0,0%)	6 (26,09%)*	1 (4,35%)	0 (0,0%)	1 (4,35%)	1 (4,35%)	4 (17,39%)*
Retiree (n=102)	3 (2,94%)	12 (11,76%)*	15 (14,71%)*	15 (14,71%)*	4 (3,92%)	0 (0,0%)	3 (2,94%)*	4 (3,92%)	0 (0,0%)	4 (3,92%)	1 (0,98%)*
Student (n=36)	1 (2,78%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	1 (2,78%)	5 (13,89%)	0 (0,0%)	5 (13,89%)	3 (8,33%)	2 (5,56%)	1 (2,78%)
Driver (n=23)	0 (0,0%)	0 (0,0%)	3 (13,04%)	2 (8,7%)	2 (8,7%)	0 (0,00%)	3 (13,04%)	1 (4.3%)	2 (8,7%)	0 (0,0%)	1 (4,35%)
General services (n=44)	4 (9,09%)	2 (4,55%)	2 (4,55%)	3 (6,82%)	4 (9,09%)	6 (13,64%)	5 (11,36%)	1 (2,27%)	4 (9,09%)	2 (4,55%)	2 (4,55%)
Others (n=291)	10 (3,42%)	14 (4,79%)	6 (2,05%)	18 (6,16%)	19 (6,51%)	29 (9,93%)	31 (10,62%)	16 (5,48%)	13 (4,45%)	14 (4,79%)	26 (8,90%)

*p<0.05 (Chi-square test)

Table 4. Logistic regression analysis between major lesions and occupational situations

Occupational situation	Lesion	Univariate analysis		Multivariate analysis	
		OR	95%CI	OR	95%CI
Domestic Services	Carpal tunnel syndrome (G56)	2.65*	1.26-5.54	2.54*§	1.16-5.56
	Shoulder injuries (M75)	2.01*	1.17-3.46	1.82*§	1.00-3.29
Civil Construction	Pain in the spine (M54)	3.03*	1.15-7.95	5.78*#	1.77-18.85
	Distal fracture of lower limb (S82)	3.39*	1.09-10.47	3.53*#	1.01-12.23
Retiree	CVA sequelae (I69)	2.07*	1.32-5.56	2.03*¥	0,91-4, 53
	Gonoarthrosis (M17)	3.81*	1,92-7.54	3.76*¥	1.80-7.87
	Osteoarthritis in the spine (M47)	2.28*	1.20-4.31	2.24*¥	1.24-4.74
	Shoulder injuries (M75)	0.23*	0.07-0.77	0.27*¥	0.85-0.92
	Distal fracture of lower limb (S82)	0.13*	0.17-0.94	0.15*¥	0.02-1.14

CI: confidence interval; OR: odds ratio; #adjusted for sex, age group and ethnicity;*p<0.05; §adjusted for age group and ethnicity only; ¥adjusted for sex and ethnicity only

DISCUSSION

When combining the non-traumatic lesions by segment of the human body, we noted that the lesions of the spine (M47, M51 and M54) were the most prevalent (22.6%), being the main reason for seeking Physical Therapy services. Literature has pointed out that back pain are important causes of work-related leave and one of the main problems of the world industry, in addition to accounting for a high cost for public services[12,13]. Low back pain affects 90% of the population throughout life, being more prevalent in some population and professional groups[14,15].

It was found in Table 3 the association of lesions with domestic and construction services, mainly for lesions of M group of ICD-10 M, including some musculoskeletal disorders. These changes are linked to tissue overload and repeatability of movements that lead to chronic injuries difficult to control, and is strongly associated with RSI/ Work-related musculoeskeletal disorders[16].

In the association analysis (Table 4), workers of the domestic services group presented OR=2.54 to carpal tunnel syndrome and OR=1.82 to shoulder injuries. It is interesting to note that according to NTEP, domestic service shows no association with groups of ICD-10. This same decree, which classifies the relationship of preponderant activities and corresponding risk grades, considers domestic services (CNAE-9700) as grade 2, which corresponds to the average risk for injuries, without specifying them[9]. In the Brazilian Classification of Occupations (CBO), this category is characterized as light physical work[17]. However, many studies have shown that domestic workers develop degenerative processes in the articulations[14,18,19], which could indicate a limitation of these instruments in determining causality in this type of occupation.

Upper limb injuries are possibly more frequent because the performance of tasks occur in shoulder flexion joint range above 60 degrees, which causes harms to the blood supply and makes the group of muscles and tendons involved in joint stabilization to suffer impact under the coracoacromial arch, in addition to the load generated by the posture of work associated with the speed of hand movements[7].

In the analysis of associations, the construction worker shows risk of developing pain in the spine (OR=5.78) and distal fractures in the lower limb (OR=3.53). This finding is consistent with the literature that points to the lack of safety at work and unfavourable ergonomic conditions in this environment, and the NTEP analysis shows association with many groups of ICD-10, as well as indicates a serious risk (grade 3), regardless of the type of activity in civil construction[7]. The knowledge on this relationship shows possibilities of action of Physical Therapy, since studies show that workplace exercises and ergonomic analysis applied to work have an impact on the quality of health of workers[20].

In relation to retirees, it was not possible to access information about the former profession and the associations observed in this study indicated the effect of the aging process. In this group there was association with gonoarthrosis (OR=3.76), osteoarthritis in the spine (OR=2.24), and cerebrovascular accident (OR=2.03), indicating the presence of degenerative articular lesions and vascular phenomena characteristic of older people[21,22].

The study showed that being retired worked as protective factor for shoulder injuries (OR=0.27) and

distal fractures of the lower limbs (OR=0.15). In the first case, this may have occurred because the cause of the lesion is associated with the joint impact on large amplitudes of motion and repetitive efforts, and aging leads to a decrease of these situations and to joint protection. In the case of fractures, the lower exposure of older people to traumatic situations, such as traffic accidents, especially with motorcycles, falls from heights and sport-related lesions[23] can justify this protection association.

The professional practice of the physical therapist in the workers' health field can be improved and expanded with the knowledge on the causal nexus of the lesions. The participation of these professionals is important in the selection of epidemiological indicators, in the formulation of ergonomic guidelines and in the creation of programs of functional physical activity[24,25]. In addition, knowing occupational hazards enable to include in the treatment conducts that allow a safe and effective return of the worker, with prevention of recurrences[26-28].

As limitations of the study it is important to mention that the cross-sectional nature of this study and the type of data collection instrument did not allow identifying other aspects that may have influenced the causal relationships found. Information such as the former occupation of retirees, clinical diagnostics and lack of information about the professional relationship, company name or field of activity could not be analyzed, because they were not part of the medical records.

CONCLUSION

Most patients of the Physical Therapy service were individuals between 20 and 59 years, female, with orthopedic problems related mainly to the upper limbs and the spine. Domestic services were a risk for the development of carpal tunnel syndrome and shoulder injuries. The construction field showed risk for pain in the spine and distal fractures of the lower limbs. Retirees had higher risk for CVA, and gonoarthrosis and osteoarthritis in the spine and protective factor for shoulder injuries and fractures of the lower limbs.

Physical Therapy focused on worker's health must develop diagnostic instruments of the causal relationship between the health condition and the occupational situation and know the currently official instruments. The integrated use of these instruments may expand the understanding of the health-disease process and subsidize the physical therapeutic actions on service organization and creation of the therapeutic process.

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