Epidemiological profile of orthopedics and traumatology patients in Palmas, Tocantins, Brazil

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ABSTRACT. Epidemiological studies, both in general and specifically, are part of the health promotion process and prophylactic actions that can generate treatment plans for a population, however, the accomplishment of prophylactic work in relation to musculoskeletal (i.e., traumatological) problems must start from the specific and go to the general, from cities to a national plan, since each population has its own characteristics in the general picture of conditions. Hypothetically, the epidemiological profile in traumatology and orthopedics, due to the general behavior in the national territory, presents the lack of prevention; in this way, is necessary to verify. This work aims to determine the incidence of orthopedic and traumatological problems in the region of Palmas, state of Tocantins (TO), Brazil, in order to contribute to a possible prophylactic plan for the population of the region. The data of the present study agree with most other studies about the orthopedic profile in terms of gender, age and problems with vertebral column, in general. However, the finding that most of the conditions were associated with scoliosis was unexpected, as it differs from the findings of most studies. It was possible to establish a profile of patients seen at the clinic-school and indicate the management of training for health professionals related to the treatment of people over the age of 40 years. The importance of the action of physiotherapists in the processes of prevention and primary care was evident given the patients indicated in this and other articles who need help with traumatic diseases.

Keywords: epidemiology; health profile; fractures bone; scoliosis; public health.

Introduction

Understanding physiotherapeutic/traumatological processes in Brazil should go through population epidemiological studies (Funk & Estivalet, 2015), to obtain important prophylactic actions in medicine, nursing and physiotherapy (Bispo Junior, 2010).

Areas such as parasitic diseases, cancer and venereal diseases (Pinheiro & Medeiros, 2013) receive great attention in prophylactic terms. The same, however, is not true for the field of traumatology, whose identification of risks to which a population is exposed is under-considered, including primary and secondary prophylaxis for osteoporosis (Souza et al., 2017).

Epidemiological studies, both in general and specifically, are part of the health promotion process and prophylactic actions that can generate treatment plans for a population (Funk & Estivalet, 2015). Pathologies not shown by epidemiological studies, however, are thwarted by the lack of information for the adequate treatment of a population.

The orthopedic and traumatology work on the prevention, diagnostic and treatment of the bones and muscles disease that are important morbidities that cause pain, deformities, loss of the normal functions place on the second score of complains of the population that seek for medical treatment (Oliveira & Braga, 2010).

In this way, the accomplishment of prophylactic work in relation to musculoskeletal (i.e., traumatological) problems must start from a specific situation as a local pain and/or lesion and go to the general, from city to a national plan (Buss, 2000), since each population has its own characteristics in the general picture of conditions.

A rural population certainly has a different epidemiological profile than an urban population, whether socioeconomic profiles such as sanitation and access to health care are considered (Soares, Moraes, Vianna, Pessoa, & Carneiro, 2015). There should also be more specific traumatologies in relation to the usual jobs as taxi drivers, masons, i.e., manual works in general, in these places and the demands of the work performed by the population in relation to the pressure of survival.

Hypothetically, the epidemiological profile in traumatology and orthopedics, due to the general behavior in the national territory, presents the lack of prevention due reasons as lack money of the patient, a Brazilian culture to avoid doctors and/or health professionals (Gomes, Nascimento, & Araújo, 2007).

This work aims to determine the incidence of orthopedic and traumatological problems cited by the population seen in a Clinical School in the region of Palmas, state of Tocantins (TO), Brazil, in order to contribute to a possible prophylactic plan for the population of the region.

Material and methods

This descriptive, quantitative and retrospective study was approved by Ethics Committee of the Centro Universitário Luterano de Palmas (CEULP-ULBRA), under No. 2.641.145, following Resolution 196/96 of National Health Council).

The study traced the epidemiological profile of traumatic and orthopedic diseases according the patients complains, age, predominant gender and the total number of patients treated by Clinical School of Physiotherapy, Faculty Objetivo of Palmas, TO, in the area of orthopedics and traumatology. Data surveys were carried out through medical records of Clinical School for the years of 2017 and 2018, collected in observance of evaluations carried out by interns under the guidance of teachers.

Criteria for inclusion and exclusion of medical records were used, i.e., only the patients who presented complete data in the fill form were included, while those with incomplete data or was in evaluation but did not return for treatment, were excluded, but no subjects were excluded because another reason. Data were collected via a previously prepared identification form, with each patient being referred to by a natural integer number starting with 1 (one). Data included gender, date of birth, age, education level, marital status, clinical diagnosis and physical therapy, and number of sessions performed. These data are the categorical variables used via χ^2 test; these variables refer about all obtained data this work compared each other as the base of the χ^2 test, a very well-known non-parametric statistical test that is specific to compare non normal variables.

All of this information was recorded on the identification form. All data were then organized by grouping clinical cases, in which diagnoses were distributed among nine categories: degenerative processes, inflammatory processes, pain processes, postoperative, fractures, herniated discs, dislocations and sprains, paralysis and repetitive strain injury (RSI)/work-related musculoskeletal disorders (WRMD).

Data from DATASUS (Brasil, 2020) on the number of hospitalizations with circulatory, parasitic, genitourinary, neurological and musculoskeletal diseases were obtained for comparison with data from this and other studies in Brazil without to consider specific data.

Statistical analysis and graphs were performed using Office Excel and StatPlus:mac software, AnalystSoft Inc. statistical analysis program for macOS®. Version v7. See https://www.analystsoft.com/en/. The χ^2 test was used to analyze categorical variables from raw data.

Results and discussion

A total of 200 medical records of physiotherapy consultations referring to the area of orthopedics and traumatology during the years 2017 and 2018 at Clinical School of Physiotherapy, Faculty Objetivo of Palmas, TO were analyzed all months between the cited years. According, 33 (14 for 2017 and 19 for 2018) were excluded because they were treating the same patient or had incomplete data.

Of the 167 medical records examined, were 180 disease, i.e., there were more than one disease for some patients, 99 (59%) corresponded to female individuals and 68 (41%) to male individuals. There was a prevalence of patients aged 41 to 50 years (24.55%) followed by 61 to 70 years (19.16%) and 31 to 40 years (16.77%) (Figure1, Table 1).

These data are similar to those obtained by other studiers in relation to orthopedics/traumatology in Brazil (Santos, Lima Neto, Ramos, & Soares, 2007; Menegazzo, Pereira, & Villalba, 2010; Oliveira & Braga, 2010; Funk & Estivalet, 2015; Rezende, Silva, Oliveira, & Trindade, 2015).

In relation to age of the patients partially coincides, in absolute terms, with data from DATASUS (Brasil, 2020), which reveals higher frequencies for patients aged 40 to 69 years (Figure 3). In the present study, however, the highest frequencies were for 41-50, 61-70 and 31-40, but with little differences among the values (Figure 1).
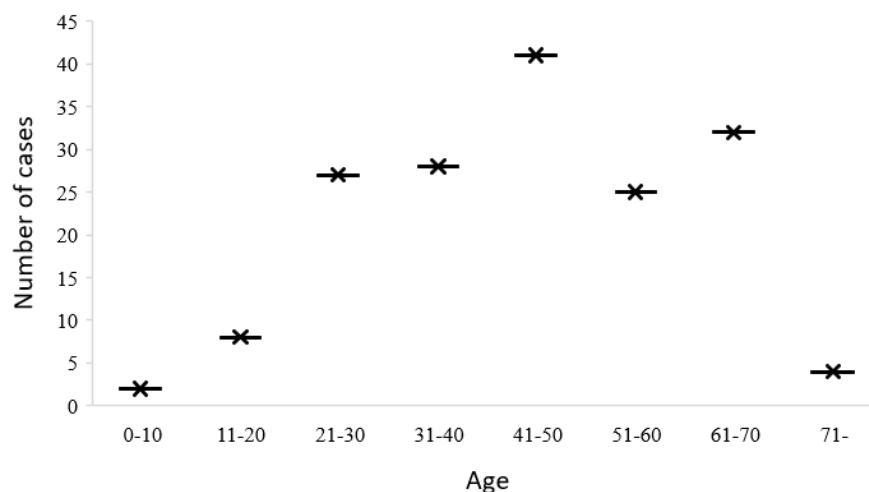
Figure 1. Number of cases of the orthopedic patients in relation to the age.

Table 1. Distribution by gender of the clinical diagnoses of the studied sample.

Diagnosis	n	%	F	M
Degenerative Processes				
Osteophytosis	10	5.55%	7	3
Scoliosis	11	6.11%	6	5
Degenerative Discopathy	8	4.44%	5	3
Osteoarthritis	10	5.55%	7	3
Chondromalacia	4	2.22%	3	1
Calcaneal Spur	2	1.11%	1	1
Arthropathy	1	0.56%	0	1
Average ± standard deviation	6.57 ± 4.15		4.14 ± 2.85	2.67 ± 1.51
Algic Processes				
Backache / Lumbociatalgia	16	8.89%	10	6
Neck pain / cervicobrachialgia	5	2.78%	4	1
More of an allergic process	7	3.89%	6	1
Average±standard deviation	9.33 ± 5,86		6.67 ± 3.06	2.67 ± 2.89
Fractures				
Upper limbs	19	10.55%	6	13
Lower members	20	11.11%	11	9
Average ± standard deviation	19.5 ± 0.71		8.5 ± 3.55	11 ± 2.83
Inflammatory Process				
Bursitis	12	6.67%	7	5
Shoulder Impact Syndrome	4	2.22%	1	3
Epicondylitis	4	2.22%	2	2
Tendonitis	5	2.78%	2	3
Plantar Fasciitis	2	1.11%	1	1
Arthritis	1	0.56%	1	0
Femoral Palet Syndrome	1	0.56%	1	0
Adhesive capsulitis	4	2.22%	1	3
Tenosinovitis	2	1.11%	2	0
Tendinopathy	2	1.11%	1	1
Average±standard deviation	3.7 ± 3.23		1.9 ± 1.85	1.8 ± 1.69
Postoperative				
Arthroplasty	3	1.67%	2	1
Ligaments / meniscus	2	1.11%	2	0
Average±standard deviation	2.5 ± 0.71		2.0 ± 0.00	0.5 ± 0.71
Herniated Disc	16	8.89%	11	5
Luxation end Sprains	4	2.22%	3	1
RSI / WRMD				
Carpal tunnel syndrome	1	0.56%	1	0
Paralysis				
Facial paralysis	3	1.67%	0	3
Bell's palsy	1	0.56%	1	0
Average±standard deviation	2 ± 1.41		0.5 ± 0.71	1.5 ± 2.12
TOTAL	180	100%	105	75

n is the number of cases, F means female and M male, RSI means Repetitive Strain Injury and WRMD, Work-Related Musculoskeletal Disorders.

Data from degenerative processes were the most prevalent in the studied sample, being present in 46 (25,54%) of the medical records (Tables 1 and 2). Among these, the highest frequency was the scoliosis, followed by osteophytosis and osteoarthritis (Tables 1 and 2). Women were the most compromised, representing 16.11% of the cases of degenerative processes with higher prevalence of osteophytosis and osteoarthritis.

The fractures were present in 39 (21.66%) of the medical records, with men having a higher incidence in the upper limbs and women in the lower limbs (Figure 2), and inflammatory processes were present in 37 (20.56%) of the medical records, with 19 for women and 18 for men. Some inflammatory processes affect men more often than women, such as Shoulder Impact Syndrome, Adhesive Capsulitis and Tendonitis.

Herniated Disc had the fifth most incidences among all the studied diagnoses, being observed in 16 (8.89%) of the medical records, with 68.75% for women and 31.25% for men (Tables 1 and 2).

Table 2. Distribution by gender of the clinical diagnoses of the sample studied.

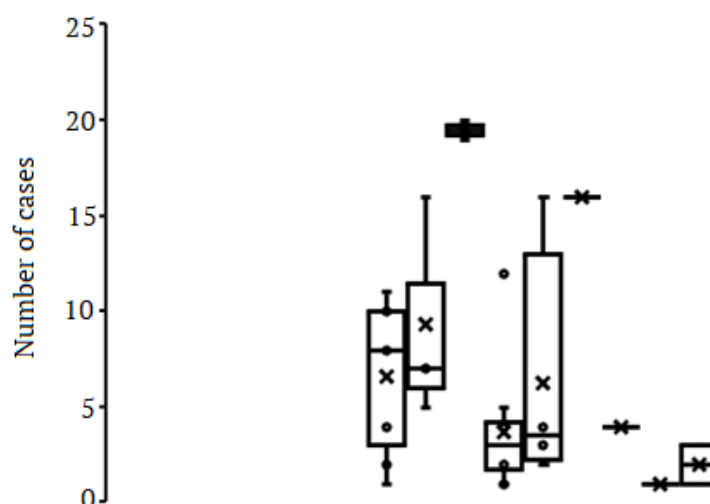| Diagnosis	N	%	F	%	M	%
Degenerative Process	46	25.56%	29	63.04%	17	36.96%
Algic Process	28	15.56%	20	71.43%	8	28.57%
Fractures	39	21.67%	17	43.59%	22	56.41%
Inflammatory Process	37	20.56%	19	51.35%	18	48.65%
Postoperative	5	50.00%	4	80.00%	1	20.00%
Herniated Disc	16	145.45%	11	68.75%	5	31.25%
Luxation end Sprains	4	50.00%	3	75.00%	1	25.00%
RSI/WRMD	1	10.00%	1	100.00%	0	0.00%
Paralysis	4	100.00%	1	25.00%	3	75.00%
Total	180		105		75	

Figure 2. Number of cases in relation of each pathology. From left to right they are: Degenerative processes; Pain processes; Fractures; Inflammatory processes; Postoperative; Herniated disc; Dislocations and sprains; READ/DORT; Paralysis. X represents the mean; the internal trait, the median; the box indicates the values from the 1st to the third quartile and the superior and inferior lines box are the maximum and minimum values; the filled circles represent the scattered points. There is a relationship between the number of cases of conditions according to the statistical test for p < 0.05.

According the statistic test, the χ^2 indicates rejection of the null hypothesis (p < 0.05) for the types of disorders among themselves and for number of cases for each gender (Figure 2).

The χ^2 test indicates rejection (p < 0.05) of the null hypothesis for the types of conditions and for the relationship between the types of conditions and gender, which indicates that values are not quantitatively significantly different from each other. However, in clinical terms, the data are very relevant for the preparation of the reception environment for patients and for health professionals who serve the population. In this sense, according to the scientific literature, must be necessary to professional of health to attend courses and/or to study treatment and care for the elderly (Santos et al., 2007, Menegazzo et al., 2010; Oliveira & Braga, 2010; Funk & Estivalet, 2015; Rezende et al., 2015).

However, the demand for treatments in traumatology, considering a general epidemiological study, is less frequently than neurology, cardiology, rheumatology and urogynecology, and the most common patients were aged between 41 and 60 years and more than 70 years, but these two parameters were within the same

standard deviation (Oliveira, Calles, Santos, & Monteiro, 2018), that indicates the same statistic values for the cited data. Orthopedic and traumatological diseases were not mentioned in other studies of general epidemiological profiles (Conceição et al., 2014; Carnaúba et al., 2017).

For a general view of the data and for a better comparison, was used the data obtained from DATASUS (Brasil, 2020) from 2015 to 2016, that revealed a higher number of hospitalizations for diseases of the circulatory system (1,178,095 patients), followed by genitourinary (871,628 patients), parasitic (806,348 patients), musculoskeletal (219,069 patients) and neurological diseases, without considering dementias (203,406 patients) (Table 3).

The musculoskeletal diseases were plotted by age, with a greater incidence for ages between 40 and 69 years (Figure 3).

Table 3. Gender distribution of hospitalizations for some diseases. Source: DATASUS (2020), data from 2015 to 2016.

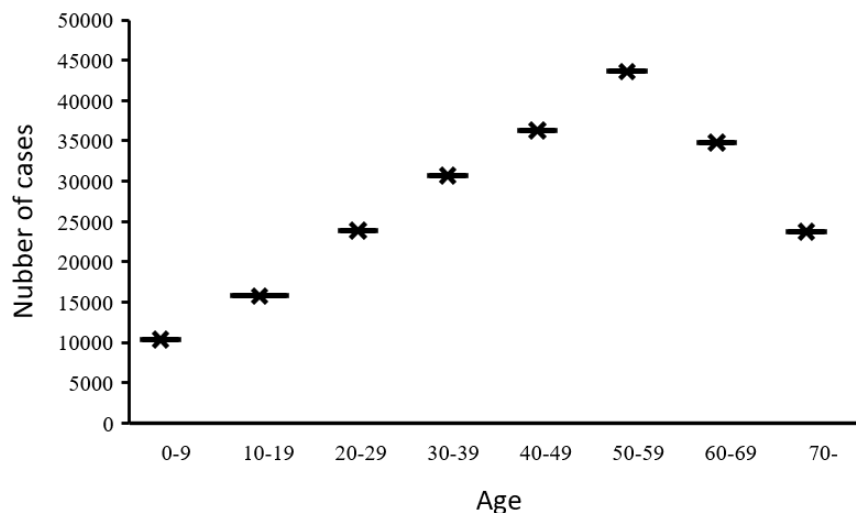|	Circulatory system	Genitourinary	Parasitic	Musculoskeletal	Neurological
Male	608329	359368	421770	116657	98772
Female	569766	512260	384578	102412	104634
Total	1178095	871628	806348	219069	203406

Figure 3. Number of hospitalizations of patients with musculoskeletal diseases (DATASUS) between 2015 and 2016 in relation to age.

A no less important data was these cited by Santos et al. (2007) about the epidemiological profile of patients on the basic health units and placed at home presenting arthritis and arthrosis as the main pathologies, followed by fractures and then stroke. Arthrosis was the most frequently observed condition in another study of basic units where physiotherapists work (Menegazzo et al., 2010).

In this way, it is reasonable to deduce that, regardless of the type of condition, increased age is associated with the demand for medical treatment. In this case, aging with health does not are occurring.

Differently, degenerative traumatological diseases were most observed in this study (25.56%), with scoliosis having the highest incidence. Similar to what was found by Oliveira et al. (2018), traumatological diseases also, in general, had the highest incidence in cases related to the vertebral column, probably due to the prevalence of a population from the rural area.

However, Oliveira et al. (2018) found scoliosis to appear in 2% of the cases of traumatological problems, but this problem was not cited as a preventive treatment with hydrotherapy (Rezende et al., 2015), nor for other epidemiological studies related to physical therapy (Santos et al., 2007; Menegazzo et al., 2010).

These data may indicate a different epidemiological profile for each location, nevertheless, the problems associated with the vertebral column are the most cited in other studies in Brazil according the literature used in this work.

In general, the traumatological problems caused by falls are more associated with the elderly, while car and motorcycle accidents occur mainly with people aged 20 and 39 years (Lomaz, Sales Netto, Garrote Filho, Alves, & Canto, 2017), with a mean of 30.7 years for motorcycles (Miki et al., 2014). As the clinic-school attends to chronic problems, and the injured are referred to the emergency department, a detailed analysis

therefore lacks data for adequate deduction. For example, considering the need for postoperative for these traumas, the demand is small for the most common age of accident victims, in the case of this work, as they represented only 2.78% of all the medical records considered (Tables 1 and 2).

After scoliosis, osteophytosis and osteoarthritis are the most prevalent degenerative conditions and with a higher incidence in women (16.11%).

The present study found men to have a higher incidence of fractures in absolute terms (56.41%). Men, in fact, have a higher number of fractures at earlier ages (20-40 years), probably due to their type of work, and the occurrence of accidents with motorcycles and automobiles (Miki et al., 2014; Lomaz et al., 2017). There is, however, no evidence of the causes for this kind of fractures in the present work, but there was no significant difference for the upper and lower limbs for men and women (56.41% and 43.59%, respectively), which seems to occur in Brazil, at least in general, since the number of hospitalizations of men for musculoskeletal problems (116,657 patients) is slightly higher (53. 25%) than the number of hospitalizations of women (102,412 patients, 46.75%) (Brasil, 2020).

The incidence of inflammatory processes also does not show significative difference between women (51.35%) and men (48.65%) in function of the standard deviation, however, some inflammatory processes affect men more than women, such as shoulder impact syndrome, adhesive capsuliotis and tendinitis, but with no statistically significant difference and with an insufficient sample for a robust statistical analysis.

This work contributes with epidemiological data for traumatology in Brazil and mainly for the Tocantins state filling a lack of data about orthopedics and traumatic morbidities. However, one of the limitations of this study is in fact the small number of cases for some conditions, which prevents a more accurate statistical analysis since, in some cases, the magnitude of the standard deviation is close to the mean (Table 1).

This study presented data identical to similar studies concerned to age, gender and spinal problems in patients who sought care in basic health units, clinic-schools and hospitals.

On the other hand, the results here for the most common type of disease, namely scoliosis, diverged widely form other studies. This difference may characterize a more specific epidemiological profile for the region of Palmas, despite scoliosis being a disease of genetic or ontogenetic cause, that is, vertebral malformations of neuromuscular disorders (Tavares Júnior et al., 2017). Nonetheless, this study was not able to diagnose causes, which may serve as a subject for specific studies of scoliosis.

The studied papers cite the prevalence of the orthopedic and traumatic problems in men, that is an expected situation because the men have jobs linked to manual works using heavy equipment, plus, the automobile and motorcycle traumatic accidents present more men as victims (Lomaz et al., 2017), and it could be linked to the kind of men's jobs and the imprudence to drive that represent 76.8% of incidence for men and for age from 20 to 29 years old, as an example in Recife, Brazil (Mendonça, Silva, & Castro, 2017).

In general, articles on epidemiological profiles mention the importance of physical therapy in hospitals and heath units (Oliveira & Braga, 2010; Conceição et al., 2014; Funk & Estivalet, 2015). Data of the World Health Organization indicate that 80% of the world population has some complaints of back pain, mainly due to posture problems (World Health Organization [WHO], 2003). However, the insertion of physiotherapists in primary health care is incipient in Brazil (Menegazzo et al., 2010).

In this sense, the physiotherapist has a fundamental role in aspects of the prevention of musculoskeletal and neuromuscular diseases in the clinic, in hospitals working alone or in multidisciplinary teams (Paula et al., 2009; Conceição et al., 2014).

Thus, epidemiological profiles of trauma and orthopedics provide scientific data that justify more constant action of physiotherapists in the preventive processes of public health (Santos et al., 2007), with planned preventive programs (Miki et al., 2014), as well as to trace regional profiles in clinics (Oliveira et al., 2018) that serve communities within urban or rural centers.

Considering health in general, the action of physiotherapists in comforting individuals is indisputable and pressing in clinics that serve the general population and in the recovery of injured patients.

In general, the elderly population is growing worldwide, and the associated musculoskeletal and neuromuscular comorbidities strongly indicate the preventive action of physiotherapists in primary health care in Brazil.

In this respect, both the clinical physiotherapist and the scientist must work in harmony, since the epidemiological aspects surveyed, as in this and other studies, generate an base of evidence to support the action of physiotherapists in the prophylaxis of aspects very important to health, such as avoiding pain in the population in general and with increasing age.

Conclusion

The data of the present study corroborate with most of the studies in terms of gender, age and problems with vertebral column. However, the finding that most conditions were associated with scoliosis differs from the findings of most previous studies.

However, it was possible to establish a profile of patients that search the clinic-school and indicate the management of training for health professionals related to the treatment of people over the age of 40 years.

The importance of the action of physiotherapists in the processes of prevention and primary care was evident in this work and cited in other articles.

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