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Epidemiology of physiotherapy utilization among adults and elderly
Epidemiologia da utilização de fisioterapia em adultos e idosos

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Abstract

Objective
To analyze the prevalence of physiotherapy utilization and to explore the variables associated to its utilization.

Methods
A population-based cross-sectional study, including 3,100 subjects aged 20 years or more living in the urban area of Pelotas, southern Brazil, was carried out. The sample was selected following a multiple-stage protocol; the census tracts delimited by the *Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute of Geography and Statistics) were the primary sample units. Following descriptive and crude analyses, Poisson regression models taking the clustering of the sample into account were carried out. Data were collected through face-to-face interviews using a standardized and pre-tested questionnaire.

Results
The lifetime utilization of physiotherapy was 30.2%; and physiotherapy utilization in the 12 months prior to the interview was reported by 4.9%. Women, elderly subjects, and those from higher socioeconomic levels were more likely to use physiotherapy. Restricting analysis to subjects who attended physiotherapy, 66% used public health services, 25% used insurance health services and 9% had private sessions.

Conclusions
This is the first population-based study on physiotherapy utilization carried out in Brazil. Utilization of physio therapy was lower than reported in both developed and developing countries. The study findings might help public health authorities to organize healthcare service in terms of this important demand.

Resumo

Objetivo
Analisar a prevalência da utilização de serviços de fisioterapia e explorar as variáveis associadas à sua utilização.

Métodos
Estudo transversal de base populacional incluindo 3.100 indivíduos com 20 anos de idade ou mais residentes na zona urbana de Pelotas, Estado do Rio Grande do Sul. A amostra foi selecionada em múltiplos estágios, sendo que as unidades amostrais primárias foram os setores censitários delimitados pelo Instituto Brasileiro de

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Geografia e Estatística. Após análises descritivas e brutas, modelos de regressão de Poisson foram utilizados, levando em consideração a estratégia amostral por conglomerados. Os dados foram coletados em entrevistas face-a-face usando questionário padronizado e pré-testado.

Resultados

A prevalência de utilização de fisioterapia na vida foi de 30,2%, sendo que 4,9% dos entrevistados usaram algum serviço de fisioterapia nos 12 meses anteriores à entrevista. Mulheres, idosos e pessoas de nível socioeconômico alto apresentaram maior uso de fisioterapia. Entre os usuários de fisioterapia, 66% usaram o Sistema Único de Saúde, 25% usaram planos de saúde ou convênios e 9% tiveram consultas particulares.

Conclusões

Este é o primeiro estudo de base populacional sobre utilização de fisioterapia no Brasil. A utilização de fisioterapia foi menor do que a relatada em países desenvolvidos e em desenvolvimento. Os resultados encontrados podem ajudar as autoridades na organização do sistema de saúde para atender esta importante demanda.

INTRODUCTION

Although physiotherapy is a recognized professional activity in Brazil since the 60's, there is an evident lack of scientific information on this discipline. A Medline/PubMed search for the words "physiotherapy" and "Brazil" in titles or abstracts resulted only in four papers. Two of these studies used experimental designs to evaluate the effects of physiotherapy on behavior during dental care in children aged 0-3 years[4] and anxiety and depression in chronic obstructive pulmonary disease patients.[5] The third paper[12] is a retrospective cohort study of 103 multibacillary leprosy patients followed during and after treatment in an outpatient clinic of a tertiary referral center in an endemic area in Brazil. The fourth one[7] concerns attitudes and beliefs of physiotherapy students in Brazil and Australia on low back pain. Exactly the same search was carried out in the Scielo database, and only one new paper was found: a study aimed at evaluating diagnostic and therapeutic aspects of bronchiectasis in 170 patients.[11] In the Lilacs database, 11 papers were found but none of these investigated utilization of physiotherapy and its determinants.

Therefore, one should highlight the lack of population-based studies describing the patterns of physiotherapy utilization in the community. The groups with higher physiotherapy utilization are also unknown. For example, in a non-scientific view, it seems that well-off individuals tend to use more physiotherapy than poor subjects, but this was never confirmed empirically.

The aims of this study were to determine: a) the lifetime prevalence of physiotherapy utilization; b) the prevalence of physiotherapy utilization within 12 months prior to the interview c) the associations between these two outcomes and gender, age, socioeconomic level and schooling. These data might help public health authorities to organize the health service in terms of this important demand.

METHODS

A cross-sectional study was carried out in the urban area of Pelotas, Brazil (population of 300,000 inhabitants), in the last trimester of 2003. The sample was selected in multiple-stages. All urban census tracts of Pelotas were stratified by the average income of family heads. Thereafter, 144 were sampled with probability proportionate to the size. Within each selected tract, households were sampled following a systematic protocol, and taking the size of the tract (number of households) into account. All residents of each sampled household were interviewed. Particularly to the investigation of physiotherapy utilization, analyses were restricted to subjects aged 20 years or more.

Due to the fact that no population-based studies were found in Brazil evaluating physiotherapy utilization, a pilot study was carried out to allow sample size calculations. Using data gathered in this pilot study, it was estimated a lifetime prevalence of physiotherapy utilization of 20%, and prevalence of utilization in the last year of 5%. With the sample size actually obtained (n=3,100), the error margins of prevalence estimates were smaller than 1.5 percentage points for both outcomes. The prior calculations to explore correlates of physiotherapy utilization required sample sizes smaller than 1,000 subjects with a minimum power of 80%, and relative risks of 2.0 or above. With the actual sample size, relative risks smaller than 2.0 were detected as significant.

In these analyses, two main outcomes were used:

lifetime prevalence of physiotherapy utilization and prevalence of physiotherapy utilization within 12 months prior to the interview. For those who attended physiotherapy at least once in a lifetime, the main determinants of the last utilization were evaluated as well as the healthcare services used (public, private, insurance).

The independent variables included were sex, age, socio-economic level (Classification of the National Agency of Research Institutes,[2] which considers both household assets and education of the family head, and where 'A' is the wealthiest group), and schooling level (years of education).

Interviewers were women with at least high-school education. They were trained for 40 hours in the application and codification of the questionnaire, and were blinded to the aims of the study. Individuals were only classified as non-respondents when they were not interviewed after at least three contacts of the interviewer (different days and hours) and one contact of a field supervisor.

Descriptive statistics included calculations of proportions and respective 95% confidence intervals for categorical variables, and means, medians, and standard deviations for numeric variables. In the crude analysis, the prevalence of each outcome was calculated for each group of the independent variables, and the significance level was tested using Wald tests for heterogeneity and trend. Adjusted analysis was carried out by Poisson regression,[3] with calculations of adjusted prevalence ratios, respective 95% confidence intervals, and significance levels using the same tests mentioned above. All analyses took the clustering of the sample into account. Due to the high level of co-linearity between schooling and socio-economic level, both were not included together in the multivariable analyses. It was opted for including socio-economic level because it fits better than schooling in the regression model, and the crude association is stronger with the outcome.

The Ethical Committee of the Faculdade de Medicina of Universidade Federal de Pelotas approved the research protocol and informed consents were obtained from each subject.

RESULTS

Figure 1 shows the number of individuals contacted, and those actually interviewed. Non-response rate was 3.5%. Non-respondents were not significantly
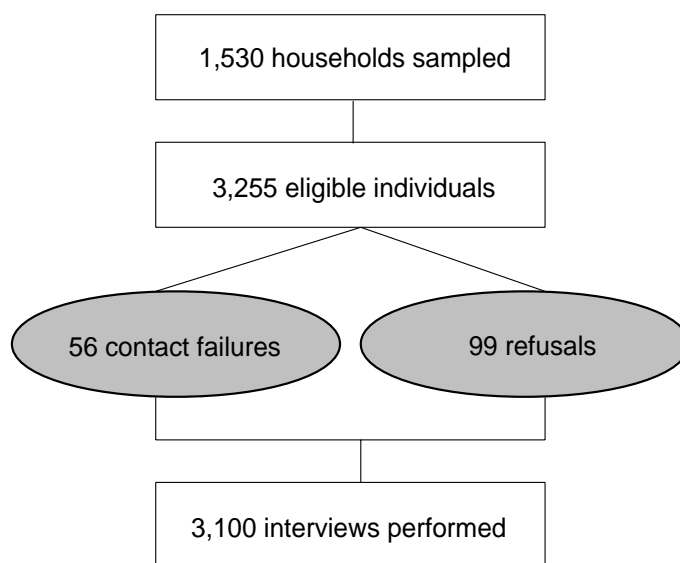

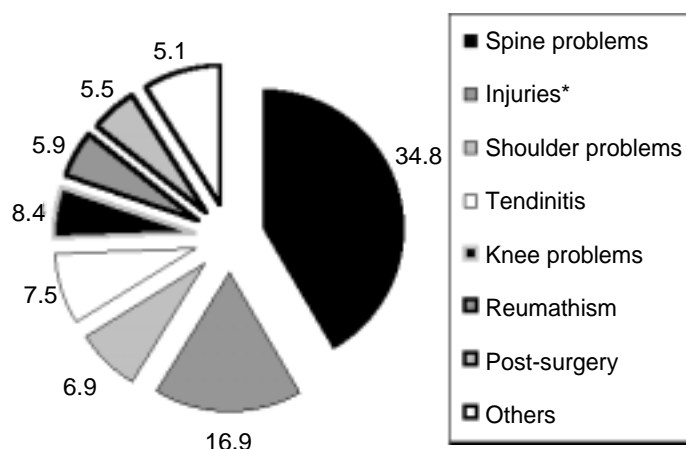**Figure 1** - Number of individuals included in the study and lost to follow-up. Pelotas, Brazil, 2003.

different from respondents in terms of age but men presented a higher non-response rate than women (4.5% and 2.8%, respectively; p=0.01). No clear trends in the non-response rate according to the census tracts (indicator of economic level) were detected.

The final sample comprised 57% women. While 5% were in the wealthiest socio-economic level (A), 7% were in the poorest one (E); 7% of the subjects had never attended school. The average age was 43.2 (20-92) years, and the median schooling was eight years.

The self-reported lifetime prevalence of physiotherapy utilization was 30.2%, and 4.9% reported to have attended physiotherapy in the 12 months prior to the interview. The design effects associated with these two outcomes were, respectively, 1.25 and 1.04. The intraclass coefficients were 0.012 and 0.004, respectively.

Overall, 936 subjects reported to undergo physiotherapy during lifetime, but due to the fact that some of them underwent it more than once, the total number of visits for different reasons in the sample was 996. Out of these visits, 185 (19%) were only due to a fracture; 60 (6%) due to a fracture and another health condition; and 751 (75%) were exclusively due to other health problems. Figure 2 shows the determinants of physiotherapy utilization among these 751 subjects. Spine problems (including back pain) were the leading determinants of physiotherapy utilization, followed by injuries (which included traumas, contusions sprains and muscle injuries).

Most subjects (66%) who attended physiotherapy

- ■ Spine problems
- ▨ Injuries*
- ▨ Shoulder problems
- ☐ Tendinitis
- ▪ Knee problems
- ▨ Reumathism
- ▨ Post-surgery
- ▨ Others

*Traumas, contusions, twisting and muscle injuries.

Figure 2 - Determinants (in percentages) of physiotherapy utilization among adults and elderly. Pelotas, Brazil, 2003.

used public services. Insurance visits accounted for 25%, while private ones were 9%. The utilization of private visits was clearly related to socio-economic level. Private services corresponded to 33%, 16%, 8%, 3%, and 0% of all physiotherapy visits among socio-economic groups A, B, C, D and E, respectively (p for trend <0.001).

Table 1 shows the overall lifetime prevalence of physiotherapy utilization and physiotherapy utilization in the 12 months prior to the interview. It also shows these results stratified by sex, age, socio-economic level and schooling. In the crude analysis, women were significantly more likely to report utilization of physiotherapy services in the 12 months prior

to the interview. Age was positively related to both outcomes. Socio-economic level was also positively associated with both outcomes, but schooling was not related to any of them.

Table 2 presents the adjusted results of the variables associated with reported physiotherapy utilization (lifetime and last year). Women were 49% more likely than men to use physiotherapy in the 12 months prior to the interview. The multivariable analysis confirmed that age and socio-economic level were positively related to both outcomes. One should note, however, that the association between socio-economic level and use of physiotherapy in the 12 months prior to the interview was of borderline significance (p=0.07).

DISCUSSION

According to the literature review, this is the first population-based study investigating utilization of physiotherapy services in Brazil. Epidemiological data on physiotherapy utilization are also scarce in developed countries. Only two studies provided data comparable to the present research. A study in Curaçao (Netherlands Antilles)[1] found a prevalence of physiotherapy utilization in the year prior to the interview of 8.8%, a result almost twice as high as that found in the present study (4.9%). One possible explanation for the different prevalence found in this study and the Netherlands Antilles one is that

Table 1 - Utilization of physiotherapy during lifetime and in the year prior to the interview, stratified by sex, age, socio-economic level and schooling. Pelotas, Brazil, 2003.

Variable	Lifetime utilization of physiotherapy		Utilization of physiotherapy in the year prior to the interview	
	Prevalence (95% CI)	p-value	Prevalence (95% CI)	p-value
Sex		0.32**		0.02**
Men	31.2% (28.7; 33.6)		4.0% (2.9; 5.0)	
Women	29.5% (27.0; 31.9)		5.7% (4.6; 6.8)	
Age (years)		<0.001***		<0.001***
20-29	14.5% (12.2; 16.8)		2.5% (1.4; 3.6)	
30-39	23.6% (20.0; 27.2)		3.1% (1.8; 4.4)	
40-49	29.9% (26.0; 33.7)		5.3% (3.5; 7.1)	
50-59	44.8% (40.5; 49.2)		6.7% (4.7; 8.7)	
≥60	47.8% (43.2; 52.4)		8.6% (6.0; 11.2)	
Socio-economic level*		0.003***		0.09***
A (wealthiest)	40.9% (32.7; 49.2)		8.1% (2.4; 13.7)	
B	32.4% (29.0; 35.9)		5.9% (4.0; 7.8)	
C	29.5% (26.4; 32.6)		4.2% (3.1; 5.4)	
D	29.3% (26.3; 32.6)		4.7% (3.3; 6.0)	
E	23.1% (17.3; 28.9)		3.5% (1.2; 5.9)	
Schooling (years of formal education)		0.10***		0.54***
0	33.9% (27.5; 40.3)		6.3% (2.9; 9.7)	
1-4	33.4% (29.1; 37.7)		5.6% (3.8; 7.4)	
5-8	29.6% (26.6; 32.5)		4.1% (2.7; 5.4)	
9-11	26.7% (23.8; 29.6)		5.2% (3.7; 6.6)	
≥12	31.9% (27.8; 36.0)		4.8% (2.6; 7.0)	
Overall	30.2% (28.4; 32.0)		4.9% (4.2; 5.7)	

*Classification of the National Association of Research Institutes (ANEP)
**Wald test for heterogeneity
***Wald test for trend

Table 2 - Multivariable analyses of the variables associated with the utilization of physical therapy during lifetime and in the year prior to the interview. Pelotas, Brazil, 2003.

Variable	Lifetime utilization of physiotherapy		Utilization of physiotherapy in the year prior to the interview	
	Prevalence (95% CI)	p-value	Prevalence (95% CI)	p-value
Sex		0.13**		0.02**
Men	1.08 (0.97; 1.20)		1.00	
Women	1.00		1.49 (1.08; 2.06)	
Age (years)		<0.001***		<0.001***
20-29	1.00		1.00	
30-39	1.60 (1.27; 2.01)		1.16 (0.62; 2.18)	
40-49	2.00 (1.66; 2.40)		1.98 (1.11; 3.51)	
50-59	3.04 (2.56; 3.61)		2.57 (1.47; 4.47)	
≥60	3.32 (2.77; 4.00)		3.35 (1.96; 5.72)	
Socio-economic level*		<0.001***		0.07***
A (wealthiest)	1.80 (1.34; 2.42)		2.36 (0.92; 6.03)	
B	1.38 (1.07; 1.76)		1.66 (0.80; 3.47)	
C	1.31 (1.01; 1.70)		1.24 (0.59; 2.61)	
D	1.26 (0.98; 1.61)		1.29 (0.62; 2.68)	
E	1.00		1.00	

*Classification of the National Association of Research Institutes (ANEP)
**Wald test for heterogeneity
***Wald test for trend

Curaçao is a small province, more developed than the city of Pelotas (and Brazil as a whole), and probably with more accessible healthcare services. In a Dutch study,[14] the equivalent percentage was 23.7%. However, this Dutch sample was derived from medical registries, and therefore, their prevalence may be overestimated. These discrepancies might reflect the likelihood that physiotherapy is less used in Brazil than in other countries.

One main finding of the study is that the variables associated with higher prevalence of physiotherapy utilization are similar to those related with overall medical visits. Women, those from higher socio-economic levels, and elderly individuals are more likely both to use physiotherapy and health services as a whole.[6]

The gender difference in terms of physiotherapy utilization is evident only for the year prior to the interview. The lifetime prevalence of physiotherapy utilization was similar between men and women. The lack of similar studies prevents further interpretation of this finding. One hypothesis would be that some decades ago physiotherapy was used mostly to treat sports injuries or work-related injuries, activities more common among men than women. Nowadays, physiotherapy is also recommended to treat rheumatic diseases, low back pain, strokes, and several other health conditions, which are more frequent among women than men, or at least, similarly reported in both sexes.

In accordance with previous Brazilian studies, low socio-economic level was related to lower utilization of health services (in this case, physiotherapy).[6] This inequality is of concern because poor people have more health conditions, such as hypertension,[13] leisure-time physical inactivity,[9] obesity,[10] and osteoporosis.[15] Therefore, one should expect poor people

to attend health services more often, which was not seen in this or other studies.[6]

The determinants of physiotherapy utilization found in the study (shown in Figure 2) were not consistent with those found in a 1985 British study.[8] While knee problems accounted for 16.5% of all physiotherapy visits in the British study, the corresponding rate in the present study was 5.5%. The proportions of physiotherapy utilization due to spine problems were 24.5% and 41.7% in the British and the present study, respectively. Shoulder injuries accounted for 13.8% of all physiotherapy visits in the British study and 7.5% in the present study.

It was previously shown[6] that, in 1992, half medical visits in Pelotas took place in the public service. In the present study, 66% of the physiotherapy visits took place in public services. In accordance with the study above, the lower the socio-economic level, the higher the utilization of public services. While 20% of all medical visits in 1992 were carried out in the private health sector, only 9% of all physiotherapy visits in 2003 were private. These differences might reflect that the patterns of physiotherapy utilization are slightly different from those of overall medical visits. Also, it points out to a different pattern of utilization of health services in 2003 when compared to 1992.

Non-response was higher among men than women. However, this difference has no strong effect in the study results. First, the lifetime prevalence of physiotherapy utilization would change from 30.2% to 30.3% if non-response rates were exactly the same among men and women. Furthermore, the variables associated with physiotherapy utilization would remain unchanged if non-response was exactly the same in both genders.

In conclusion, the prevalence of physiotherapy utilization in this Brazilian sample was lower than reported in both developed (Netherlands)[14] and developing countries (Netherlands Antilles).[1] Despite methodological differences, this result is of concern, because physiotherapy might play an important role in health prevention, rehabilitation, and improvement of patients' quality of life. Furthermore, physiotherapy utilization reduces the time spent by patients at the hospitals, reducing care costs.

Finally, the study data might help public health authorities to organize the healthcare service in terms of this important demand. Improvements in terms of availability and access to health services are warranted, and should increase physiotherapy utilization in Brazil. Physiotherapy should also be included in primary care, for example, in the Family Health Program, as a strategy to extend its benefits to the population at risk, especially to the elderly and individuals with chronic diseases.

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