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Individual factors associated with medical consultation by adults

ABSTRACT

OBJECTIVE: To identify individual characteristics associated with a higher likelihood of consulting a physician and excess physician appointments.

METHODS: We carried out a population-based study including 3,100 adults (≥ 20 years) living in the city of Pelotas, Southern Brazil between October and December 2003, using a multi-stage cluster sampling strategy. Subjects were interviewed to obtain socioeconomic, demographic, and health-related data, as well as information on the number of medical appointments in the past three months. Overusage was defined as ≥ 4 appointments. Multivariate analysis was carried out using Poisson regression based on a conceptual model, and results are presented as prevalence ratios and their respective 95% confidence intervals.

RESULTS: The prevalence of medical appointments was 55.1%. Higher likelihood of consulting a physician was associated with female sex, hospital admission in the past year, former smoking, diabetes, and arterial hypertension. We found an increasing trend in the number of appointments with increasing age ($p < 0.001$) and decreasing self-perceived health status ($p < 0.001$). Prevalence of over utilization was 9%, and showed positive association with increased body mass index, ($p = 0.01$), increasing age ($p = 0.006$), and decreasing self-perceived health status ($p < 0.001$).

CONCLUSIONS: Presence and over utilization of physician appointments were associated with female sex, hypertension, and hospital admission in past year, as well as with increasing age and decreasing self-perceived health status.

KEYWORDS: Health services, utilization. Health services accessibility, statistics & numerical data. Health services needs and demand, statistics & numerical data. Cross-sectional studies.

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INTRODUCTION

The use of epidemiology in the field of health services is growing in importance, providing subsidy for decision making by health care managers, especially regarding its evaluation.²¹ In this context, population-based studies provide valuable information for the characterization of users and of service usage patterns, allowing for better understanding and greater applicability of the results achieved by these services.^{5,7,8,16}

The need for knowing the characteristics of health service users and usage patterns are of primary importance for the planning of health care systems. Studies conducted in Southern Brazil have provided important information on this subject, especially with respect to medical appointments.^{6,14} However, structural and functional changes in Brazil's health care system require that information regarding health service use be periodically updated. In Pelotas, a city in Southern Brazil, the last available data date from 1992.

Information about the individuals that seek medical appointments is of great importance to health service management. These individuals overload the outpatient appointment system, both in terms of time (greater demand for services) and budget (increased use of complementary tests).

There are several reasons leading individuals to seek health services; these include disease prevention and administration, as well as acute and chronic diseases.⁶ Moreover, aspects related to individuals, services, the health care system, and its professionals overlap, creating a complex causal chain underlying the use of health services.

The aim of the present study was to characterize health service users and to identify individual determinants of usage and over utilization of medical appointments, so as to increase current knowledge about the population of users of the Brazilian health care system.

METHODS

The city of Pelotas, in the extreme South of Brazil, has about 320 thousand inhabitants, 93% of which live in the urban area.⁹

We conducted a cross-sectional, population-based study including adult subjects (20 years or older) living in the urban area. We excluded all institutionalized persons, as well as those incapable of answering the questionnaire. Fieldwork took place between

October and December 2003, using methods described in a previous publication.⁴

In order to determine the prevalence of medical appointments in the studied period, it would be necessary to interview 2,873 subjects. Sampling was carried out in multiple stages, and was based on the latest Brazilian populational census, conducted in 2000 by the *Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute for Geography and Statistics – IBGE).⁹ Census sectors were ordered according to increasing mean income. We selected 144 of the 404 sectors by systematic random selection.

In the next stage, we selected an average of 10 homes in each sector (n=1,530 households). These households were visited, and questionnaires were administered to all household members aged 20 years or older. All questionnaires were administered by trained interviewers.

Dependent variable medical appointments was self-referred by subjects, who indicated whether they had "had any medical appointments in the three months prior to date of the interview." The second outcome studied (four or more medical appointments in the last three months) was obtained based on the self-referred number of appointments in this period. The cutoff point of four or more appointments was chosen based on recommendations of the Brazilian Ministry of Health, which recommends in average two to three appointments per person per year. We chose to use a three-month recall period, since longer recall periods would probably lead to an underestimation of results.¹⁹ Both outcomes were analyzed according to the same independent variables, and using the same hierarchic model. Independent variables investigated included sex, age (in complete years), schooling (in complete years), skin color (classified by the interviewer as white or nonwhite), marital status (married or with partner; single or without partner; divorced; widow(er)), and social class. For the latter, we used the classification proposed by the *Associação Brasileira de Empresas de Pesquisa** (Brazilian Association of Market Research Companies - ABEP), which divides persons into five economic classes – A through E – in decreasing order from richest to poorest. For analysis purposes, this variable was regrouped into AB, C, and DE due to the small number of subjects in the extreme classes.

We also investigated health-related independent variables, including hospital admissions in last year, presence of physician-diagnosed Diabetes Mellitus (DM) or systemic arterial hypertension (SAH); smoking

*Disponível em http://www.abep.org/codigosguias/ABEP_CCEB.pdf [acesso em 6 fev 2006]

(considering as smokers subjects who smoked at least one cigarette per day for more than one month, and as former smokers subjects who had stopped smoking for at least one month); and body mass index (BMI), in kg/m². BMI was calculated based on self-reported weight and height, and was divided into four categories: obese (BMI > 30 kg/m²), overweight (BMI between 25 and 29.9 kg/m²), normal (BMI between 18.5 and 24.9 kg/m²) and underweight (BMI < 18.5 kg/m²). Self-perceived health status was also investigated, and was divided into three categories: (1) excellent and very good, (2) good, and (3) regular and poor.

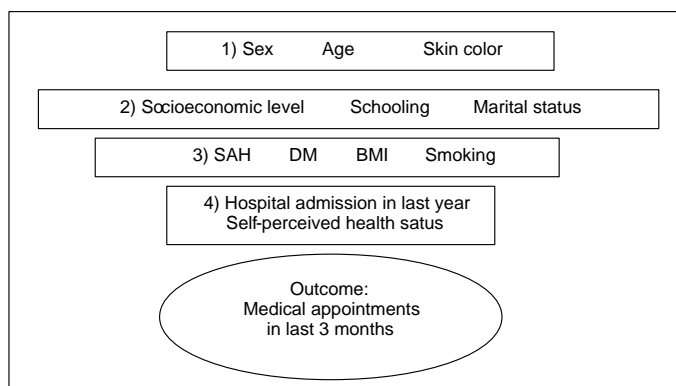
The prevalence of the outcome according to each of the independent variables and crude odds ratios were calculated using bivariate analysis. Adjusted analyses were carried out using a hierarchic model of analysis,²³ as shown in the Figure. According to this approach, the effect of each variable was controlled for variables in the same or higher levels. Age, sex, and skin color were placed in the first level, since these variables may be determinants of differential insertion into the labor market and of differences in salary. Variables with p-values ≤0.20 were kept in the model to allow for the control of potential confounders. Since this was a frequent outcome, Poisson regression with backward selection was used to obtain prevalence ratios.² Statistical analyses were carried out using Stata 8.0 software. All analyses considered the cluster sampling design.

The research protocol was approved by the Research Ethics Committee of the Faculdade de Medicina of Universidade Federal de Pelotas.

RESULTS

Losses and refusals amounted to 3.5% of the initial sample. We thus interviewed 3,100 subjects aged 20 years or older. The design effect for the outcome was 0.95. Prevalence of at least one medical appointment in the last three months was 55.1% (95% CI: 53.4%-56.9%). The mean number of appointments in this period was 1.36 (95% CI: 1.28-1.44).

Most subjects in the sample were women, had white skin (81%), and belonged to the lower socioeconomic classes. Mean age was 43 years and mean schooling, 8 complete years. Roughly one-third of the sample was classified as overweight (32.7%), and almost one-half showed normal BMI (49.4%). Tables 1 and 2 present these and other characteristics of the sample.



SAS: Systemic Arterial Hypertension; DM: Diabetes Mellitus; BMI: Body Mass Index.

Figure - Hierarchic analysis model. Level 1 includes the distal variables; levels 2 and 3 include intermediate variables; and level 4 includes proximal variables. Pelotas, Southern Brazil, 2003.

Medical appointments (Table 1) were more frequent among women, subjects from higher economic classes, and subjects aged 60 years or older. There was a linear trend with increasing age, with subjects aged 60 years or older showing 28% greater probability of having had a medical appointment than those aged 20-29 years, which were considered as the reference group.

Schooling (p=0.1) and skin color (p=0.4) were not significantly associated with medical appointment, in neither crude nor adjusted analysis (adjusted p-values given). Subjects in the divorced/widow(er) category showed 11% lesser probability of medical appointments in last three months than those married or with partner. Probability of medical appointment was also directly associated with socioeconomic level, which showed a strong association with the outcome in crude analysis, but only borderline association (p=0.05) after adjustment in the model.

Regarding population health aspects (Table 2), subjects who reported SAH, DM, or hospital admissions in past year showed, respectively, 19%, 16%, and 46% greater probability of medical appointments in last three months than their reference groups.

Prevalence of appointments was greater among former smokers (60.4%). This group showed 12% greater probability of medical appointment in the studied period than subjects who never smoked. There was no significant association in the prevalence of appointments between smokers and subjects who never smoked. Self perceived health status showed a linear association with medical appointments, the probability of the latter increasing as self-perceived health status decreased (p<0.001), both in crude and adjusted analysis.

Table 1 - Prevalence of medical appointments (P) and crude and adjusted prevalence ratios (PR) according to socioeconomic and demographic variables. Pelotas, Southern Brazil, 2003. (N=3,100).

Variable	%	P (%)	Crude analysis PR (95% CI)	p	Adjusted analysis* PR (95% CI)	p
Sex				<0.001**		<0.001****
Male	43.4	42.6	1.00		1.00	
Female	56.6	64.7	1.52 (1.41;1.63)		1.51 (1.40;1.62)	
Age (complete years)				<0.001***		<0.001***
20-29	24.5	49.3	1.00		1.00	
30-39	20.8	48.7	0.99 (0.89;1.10)		0.98 (0.89;1.09)	
40-49	21.9	58.3	1.18 (1.07;1.31)		1.18 (1.07;1.30)	
50-59	15.9	58.0	1.18 (1.05;1.32)		1.17 (1.05;1.30)	
60+	16.9	64.8	1.31 (1.19;1.45)		1.28 (1.16;1.42)	
Economic class				0.001***		0.05***
D/E	41.9	52.2	1.00		1.00	
C	33.0	53.9	1.03 (0.95;1.12)		1.02 (0.93;1.12)	
A/B	25.1	61.6	1.18 (1.08;1.29)		1.13 (1.01;1.27)	
Marital status				<0.001****		0.01****
Married	63.2	55.9	1.00		1.00	
Single	21.1	48.6	0.87 (0.79;0.95)		0.89 (0.81;0.98)	
Divorced/Widow(er)	15.7	60.7	1.09 (0.99;1.19)		0.89 (0.80;0.98)	

*Analysis adjusted for variables in the same and higher levels

**Chi-square test

***Linear trend test

****Heterogeneity test

BMI showed no significant association with probability of medical appointments, even after adjustment ($p=0.4$). However, it should be noted that this analysis did not include 381 subjects (12.2%) with missing weight and/or height.

Table 3 presents the results regarding excess medical appointments. Prevalence of over utilization was 17.0% (95% CI: 15.2%-18.8%) among patients who reported medical appointments in last three months, and 9.4% (95% CI: 8.2-10.5) among the general sample. The mean number of appointments in this group was 6.8 (95% CI: 5.8-7.7) in the three month period investigated.

Among socioeconomic and demographic variables, female sex and older age showed significant associa-

tions with the outcome in both crude and adjusted analyses. Women were 2.6 times more likely to have had excess medical appointments than men ($p<0.001$). There was an increasing trend in the prevalence of over utilization with increasing age, subjects 60 years and older showing greater probability of over utilization of the health care system. Age, schooling, economic class, skin color, and marital status were not significantly associated with the outcome in neither crude nor adjusted analysis.

Regarding health-related variables, subjects who reported hospital admission in last year were three times more likely to show excess appointments than subjects who did not. Unlike what was seen in relation to the presence of medical appointments in last three months, BMI showed a linear association with excess appoint-

Table 2 - Prevalence of medical appointments (P) and crude and adjusted prevalence ratios (PR) according health-related variables. Pelotas, Southern Brazil, 2003. (N=3,100).

Available	%	P (%)	Crude analysis PR (95% CI)	p	Adjusted analysis* PR (95% CI)	p
Hospital admissions in last year				<0.001**		<0.001****
No	91.1	52.3	1.00		1.00	
Yes	8.9	84.7	1.62 (1.53;1.72)		1.46 (1.38;1.54)	
Smoking				<0.001****		0.003****
Never smoked	51.2	56.0	1.00		1.00	
Smoker	26.7	49.2	0.88 (0.81;0.96)		0.98 (0.89;1.06)	
Former smoker	22.1	60.4	1.08 (1.00;1.16)		1.12 (1.04;1.21)	
Self-perceived health status				<0.001***		<0.001***
Excellent/very good	27.9	48.1	1.00		1.00	
Good	46.4	51.1	1.06 (0.97;1.16)		1.06 (0.97;1.15)	
Regular/poor	25.7	70.0	1.46 (1.33;1.60)		1.33 (1.20;1.48)	
Self-referred DM				<0.001****		0.002****
No	93.6	54.2	1.00		1.00	
Yes	6.4	71.1	1.31 (1.20;1.44)		1.16 (1.06;1.26)	
Self-referred SAH				<0.001****		<0.001****
No	76.5	51.3	1.00		1.00	
Yes	23.5	68.0	1.32 (1.24;1.42)		1.19 (1.10;1.28)	

DM: Diabetes Mellitus; SAH: systemic arterial hypertension

*Analysis adjusted for variables in the same and higher levels

**Chi-square test

***Linear trend test

****Heterogeneity test

ments, probability increasing along with BMI ($p=0.01$). Self-perceived health status also showed a significant linear association with the outcome ($p=0.001$). Subjects who considered their own health status as regular or poor were 3.8 times more likely to have had four or more appointments in the preceding three months. Chronic diseases (DM and SAH) were associated with excess appointments in crude analysis. However, only the association with SAH remained significant after adjustment. Smoking did not show significant association in neither crude nor adjusted analysis.

DISCUSSION

The present study allowed for the identification of individuals that have used the different types of health services available, rather than only those services covered by the traditional information system. Furthermore, it allowed us to obtain information on the users of these services, unlikely to have been available from medical charts or health facility registries.

A limitation of cross-sectional studies is reverse causality. The diseases investigated (SAH and DM) would be more susceptible to this type of bias, especially because these diseases may remain asymptomatic for many years, and because arterial pressure and blood

glucose measures are frequent among persons who visit physicians. On the other hand, the Brazilian Ministry of Health management protocols* recommend frequent follow-up appointments, once diagnosed, for patients with these diseases. A further limitation is the fact that the reasons for appointments, already known to be an important determinant in this context,²⁰ were not investigated.

The use of health services for medical appointments has been investigated in several countries. Although these studies analyze various age groups, and use different recall periods, reported prevalences of medical appointments do not show great variation.¹³ In Ireland, in a population aged 15 years or older, 61% of subjects had had medical appointments in the 12 months preceding the interview.¹⁵ In the city of Rio Grande, Southern Brazil, a study using the same age group as the Irish study reported 66% prevalence of appointments in last year and 28.7% in last two months.¹⁴ A study conducted in 1992 in Pelotas recorded 70% prevalence of medical appointments in one year, and 56.5% in three months, for a population aged 20 years or older.⁶ Similar prevalence was detected in the present study (55.1%).

Female sex was associated with greater usage of medi-

Table 3 - Prevalence of over utilization (P) and crude and adjusted prevalence ratios (PR) according to socioeconomic, demographic, and health-related variables. Pelotas, Southern Brazil, 2003. (N=3,100).

Available	P (%)	Crude analysis		Adjusted analysis*	
		PR (95%CI)	p	PR (95%CI)	p
Sex					
Male	4.8				
Female	12.8	2.65 (2.06;3.39)		2.62 (2.04;3.37)	
Age (complete years)			0.004***		0.006***
20-29	8.3	1.00		1.00	
30-39	7.4	0.90 (0.62;1.30)		0.88 (0.61;1.27)	
40-49	9.3	1.12 (0.78;1.60)		1.11 (0.78;1.57)	
50-59	10.1	1.22 (0.87;1.72)		1.21 (0.87;1.70)	
60+	12.6	1.52 (1.10;2.12)		1.46 (1.05;2.04)	
Hospital admissions in last year			<0.001**		<0.001****
No	7.4	1.00		1.00	
Yes	29.6	3.99 (3.21;4.96)		3.03 (2.38;3.86)	
BMI (kg/m ²)*****			0.001***		0.01***
<18.5	4.5	1.00		1.00	
18.5-24.9	8.2	1.83 (0.61;5.49)		2.14 (0.71;6.49)	
25.0-29.9	10.0	2.24 (0.73;6.86)		2.66 (0.85;8.36)	
30+	13.3	2.97 (0.96;9.21)		2.93 (0.92;9.37)	
Self-perceived health status			<0.001***		<0.001***
Excellent/very good	3.8	1.00		1.00	
Good	7.5	1.95 (1.31;2.92)		1.74 (1.17;2.60)	
Regular/poor	18.8	4.93 (3.46;7.01)		3.76 (2.58;5.47)	
Self-referred DM			<0.001**		0.09****
No	8.9	1.00		1.00	
Yes	17.0	1.92 (1.37;2.68)		1.40 (0.95;2.07)	
Self-referred SAH			<0.001**		0.02****
No	7.9	1.00		1.00	
Yes	14.2	1.81 (1.43;2.29)		1.45 (1.06;1.99)	

BMI: body mass index

*Analysis adjusted for variables in the same and higher levels

**Chi-square test

***Linear trend test

****Heterogeneity test

*****BMI was not calculated for 381 subjects due to missing weight and/or height data

cal services, confirming findings from different countries.^{6,14,15,17,20,22} Studies indicate that women in reproductive age have more frequent appointments, suggesting gynecological or obstetric reasons.¹³ Another likely reason is that women would perceive potential risks to health more easily than men, given their greater access to health-related information.¹⁷ In the present study, we found a greater number of appointments among women in the 40-49 years age group.

Older subjects also showed greater probability of medical appointments, confirming findings from several countries.^{1,6,12,13,20}

The role of schooling as a determinant of health service usage is controversial. In a review of the literature, Mendoza-Sassi & Béria¹³ (2001) described a number of studies, with divergent results. Population-based studies^{6,14} from Southern Brazil show an influence of schooling on the frequency of medical appointments and on the type of service used. A study carried out in Curacao¹ found no association between schooling and appointments with general physicians, but did detect an association when specialist appointments were considered. Such studies suggest inequities in service usage, and indicate schooling as a potential determinant. The present results show no significant association between schooling and medical appointments, probably because we did not consider the reasons for these appointments.²⁰

In the same context, subjects of higher socioeconomic level showed greater probability of medical appointments. This variable is reported in a number of studies as an important determinant of health service usage and of inequities in health care.^{1,6,14,15,22}

Marital status remained significantly associated with health service usage, subjects living with partners being more likely to have had medical appointments. An Australian study raised the hypothesis¹⁷ that married men are influenced by their partners to seek medical care. The same study indicated that separation or divorce would lead to greater demand for these services by both sexes. The latter effect was not detected in the present study.

Regarding health-related aspects, we found that subjects who had been admitted to hospitals in the past year showed roughly 10% greater probability of medical appointments than those who had not. A similar finding had been reported by Costa & Facchini⁶ (1992), in a study carried out in the same city. These authors attributed this association to the fact that hospitalized persons are potentially more ill than other individuals. Along the same lines, subjects with

chronic diseases such as DM and SAH in the present study were more likely to have had medical appointments, corroborating the results obtained by several other authors.^{6,13-15,20}

The act of seeking a health facility for an appointment depends, basically, on factors related to both service availability and to the subject him or herself.^{11,13} For each individual, seeking health care depends on the disease itself (objective factor), with its clinical characteristics, signs, and symptoms, and on the meaning attributed to the disease by the individual (subjective factor). This subjective aspect of the health-disease process is addressed in the present study through the evaluation of self-perceived health status in the subjects interviewed. This variable has been shown to be a good indicator of global health status,^{3,20} and has been used, with certain variation among instruments, by a number of authors.^{1,12,14} The results found in Pelotas show greater service usage by subjects who perceived their health as regular or poor, confirming the results of prior studies.^{12,14}

Regarding smoking, we found greater probability of medical appointments among subjects considered as former smokers, which is in agreement with the findings of a Korean study.¹⁰ It is possible that subjects who stopped smoking had more appointments due to greater health concerns, considering themselves at greater risk of disease due to their status as former smokers. This notion may be a result of the continuous anti-smoking campaigns maintained by the Brazilian government. Another hypothesis, which indicates the possibility of reverse causality, is that subjects may have stopped smoking because of tobacco-related diseases, and thus required more frequent medical appointments.

Results regarding BMI show no association between this variable and medical appointments, unlike what was reported in an Australian study,¹⁸ which identified an association between obesity (BMI \geq 30 kg/m²) and greater use of health services, which was more pronounced among women. A possible reason for this difference would be that, in the present study, the number subjects with missing weight and/or height was high, accounting for 12.2% of subjects in the sample. These subjects were mostly women (82.9%) with mean schooling between zero and four years (58.4%), belonging to economic classes D and E (73.9%), with no history of HAS (62.0%) or DM (90.8%). Women with these characteristics showed BMI between 18.5 and 24.9 kg/m².

Unlike the association with medical appointments in the past three months, users with higher BMI showed

greater number of appointments than those with lower BMI. Explanations for this finding include a possible greater concern with health among the overweight or obese subjects that had had appointments. Alternatively, these subjects may be the object of greater attention by physicians, who would request more frequent follow-up visits. A third hypothesis is that, like smoking, obesity and overweight are risk factors for a series of other diseases, including SAH and DM, both of which are positively associated with health service usage. Indeed, subjects who reported hypertension showed greater probability of excess medical appointments, confirming the results of Costa & Facchini⁶ (1997), who detected a mean 4.3 appointments per year among subjects with these diseases.

In the present study, the mean number of appointments among the studied population was 1.4 appointments in a three-month period. This number is much higher than the two to three appointments per year recommended by the Brazilian Ministry of Health.

The characterization of the group of individuals with excess medical appointments will provide important information for health service managers to plan dif-

ferential care for this group of users. Such planning may include the adoption of programs and protocols designed specifically for the elderly population, women, and for patients with chronic diseases. This may prove an important strategy for the reduction of hospital admissions.

The present study underscores the importance of monitoring the use of health services as a means of providing subsidy to service management. Monitoring is justified by the recent changes in the Brazilian health care system, which include the implementation of family health programs and expansion of the primary health care network.

Finally, at a time when equity is a major goal within the Brazilian health care system, it is necessary to investigate, in addition to the characteristics of health care supply, individual factors associated with service usage, which include the reasons leading to this usage. Further studies evaluating the characteristics not only of users, but also of persons that sought health care without success, are as necessary for an effective prevention of inequities in health as the study of the characteristics of services themselves.

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