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Sex-specific differences in prevalence and in the factors associated to the search for health services in a population based epidemiological study

Diferenças sexo-específicas na prevalência e nos fatores associados à procura por serviços de saúde em estudo epidemiológico de base populacional

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ABSTRACT: *Objectives:* To identify the access to health care services and associated factors in adults living in the city of Ribeirão Preto, São Paulo, Brazil, in 2007. *Methods:* A cross-sectional population-based epidemiological study with a sample developed in three stages. The variability introduced in the third sampling fraction was corrected by the attribution of weights, resulting in a sample of 2,471 participants. The outcome prevalence was estimated according to socio-demographic, behavioral and health-related variables. In order to identify associated factors, the regression of Poisson was used, obtaining crude and adjusted prevalence ratios. All estimates were calculated taking into account the effect of the sampling design. *Results:* The outcome prevalence increased according to the age, being higher in female individuals. A different set of variables remained in the final models, considering each gender separately. Among men, the monthly income > R\$ 1,400.00; scores > 823.6 to the Economic Indicator of Ribeirão Preto (IERP) and daily average of sitting down time (154.4 – 240 min/day) constituted themselves into protective factors, whereas the increase of age and scholarship, hospitalization, diabetes and hypertension constituted risk factors for the use of the services. Among women, health self-reported as regular, hospitalization, diabetes and hypertension characterized factors positively associated to the outcome at matter. *Conclusions:* The results indicate the need for planning actions aimed at capturing male individuals, as well as the revaluation of detection and control of diabetes and hypertension programs, aimed at the primary prevention of terminal cardiovascular events.

Keywords: Health Services. Correlates. Cross-sectional studies. Epidemiology. Public health.

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RESUMO: *Objetivo:* Identificar a prevalência da utilização de serviços de saúde e fatores associados em adultos de Ribeirão Preto, São Paulo, em 2007. *Métodos:* Estudo epidemiológico transversal de base populacional, com amostragem desenvolvida em três estágios. A variabilidade introduzida na terceira fração foi corrigida pela atribuição de pesos, originando amostra ponderada de 2.471 participantes. As prevalências do desfecho foram estimadas segundo variáveis sociodemográficas, comportamentais e relacionadas à saúde. Para identificar fatores associados foi utilizada a regressão de Poisson, obtendo-se razões de prevalências brutas e ajustadas. Todas as estimativas foram calculadas levando-se em consideração o efeito de desenho amostral. *Resultados:* A prevalência do desfecho aumentou com a idade, sendo maior no sexo feminino. Diferentes variáveis permaneceram nos modelos finais, após estratificação por sexo. Entre os homens, renda mensal > R$ 1.400,00, escores > 823,6 para o Indicador Econômico de Ribeirão Preto (IERP) e média diária de tempo sentado (154,4 – 240 min / dia) se constituíram em fatores de proteção, enquanto que aumento da idade e da escolaridade, internação hospitalar, diabetes e hipertensão em fatores de risco para a utilização de serviços. Entre as mulheres, saúde autorreferida como regular, internação hospitalar, diabetes e hipertensão se configuraram como fatores associados positivamente ao desfecho em questão. *Conclusões:* Os resultados indicam a necessidade de planejamento de ações que visem maior captação de pessoas do sexo masculino, bem como de reavaliação de programas de detecção e controle do diabetes e da hipertensão, com vistas à prevenção primária de eventos cardiovasculares terminais.

Palavras-chave: Serviços de saúde. Fatores associados. Estudos transversais. Epidemiologia. Saúde pública.

INTRODUCTION

The demographic and epidemiological transition involves complex changes in the patterns of morbidity and mortality, resulting from changes in the age structure, throughover time[1]. Important consequences of the demographic and epidemiological transition are the aging population and the gradual replacement of infectious diseases by chronic degenerative ones, these being the main causes of morbidity and mortality[2].

This changing in the epidemiology profile has led to high cost medical and hospital treatment, considering the increased demand for ambulatory health services and hospitalization which, together, requires the implantation of new health models, in order to deal with the problem[3].

The concept of access to health services is complex and it is related to the availability of the services and their proper coverage. It involves the perception of health needs and the convertion of these needs into demand and use of the services, making access, therefore, a result of the possibility of usage of health services, whenever needed[4-6].

The factors that predispose to the use of health services are the result of a set of determining factors which include chronic diseases, disabilities, sociodemographic,

behavioral and health-related factors. The consumption capacity of services is also influenced by public or private insurance coverage, by the type of service offering and by the needs of the individuals[6,7].

Results of different cross-sectional epidemiological studies conducted in Brazil[8-10] showed that sociodemographic factors (gender, age and income), behavioral factors (smoking habits) and health-related ones (self-reported health, hospitalization in the previous year, and diabetes mellitus) were associated with the access to services, although the measures of association have presented different directions or magnitudes, when considering gender stratification.

Given the intrinsec epidemilogical relevance to the knowledge of profile of the users of health services in Ribeirão Preto, São Paulo, the present study aimed at estimating the usage prevalence of these services according to sociodemographic, behavioral and health related variables, in an attempt to identify the list of factors independently associated to the outcome of interest.

METHODOLOGY

STUDY DESIGN AND SAMPLING PROCEDURE

The study presents cross-sectional design, being an integral part of the Project EPIDCV (Prevalence of cardiovascular disease and identification of associated factors among adults living in Ribeirão Preto, SP), population-based epidemiologic study whose data collection was conducted in this municipality, in the period 2007/2008.

The sampling procedure was developed in three stages, and the precision of the estimates, calculated on a sample of 1,205 individuals, corresponded to sampling errors fixed around 2% (for prevalences below 15% or above 75%) and around 3% (for prevalences between 20 and 80%). In the first stage, 81 census areas were drawn, and in the sequence, 1,672 households, and 1,395 participants, the latter corresponding, respectively, to the 2nd and 3rd stages of sampling. The response rate was 82.1%, which corresponded to 1,133 adult participants. The variability introduced, especially in the third sampling fraction, was corrected by calculating the sample weights which took into consideration the "number of eligible units of each household" and the "no answer" rates, in each census area. Altogether, 1,133 participants of both gender were interviewed. The losses (18.8%) were due to change of address (4.8%); death (0.5%) and refusals (13.5%), thses last ones to be considered as such after 5 contact attempts for the interview on alternate days and periods. The population estimates were based on the 2000 Census[11]. The study was conducted on weighted sample (n^w) of 2,471 participants[12]. The sample of the EPIDCV project is characterized as a complex sample (multistage lottery) and, for this reason, the analysis must take into account the effect of sampling design. Therefore, sample weights (probability weights) were

calculated afterwards for the recovery of the total eligible ones and for correction of the non-response rate in each census area of the sample.

The first sample weight (w_1) corresponded to the inverse of the probability of being drawn among the eligible ones:

$$w1 = \cfrac{1}{\cfrac{No.drawn}{No.elegible}} \quad \therefore \quad w1 = \frac{No.elegible}{No.drawn}$$

The second sample weight (w_2) corresponded to the inverse of the probability of being interviewed, among the drawn ones:

$$w2 = \cfrac{1}{\cfrac{No.interviewed}{No.drawn}} \quad \therefore \quad w2 = \frac{No.drawn}{No.interviewed}$$

The final sample weight corresponded to the product w_1 x w_2, originating the fraction w_{12}, necessary for recomposing the total eligible ones, in each household, and for the correction of the non-response rate in each census area. After weighting, it was obtained a sample of 2,471 participants (n_w) which effectively constituted the studied population.

STUDY'S VARIABLES

- Dependent variable: *Use of Health Services.* This variable was generated dichotomously (yes/no) from the information of the study's participants on the use of ambulatory health services in the six months preceding the interviews.
- Independent variables: *Sociodemographic variables*: were included participants of both gender and aged 30 years or more. The *educational level* was classified according to the number of completed years of formal schooling. From information on the *individual income* in the past 30 days, the participants were classified according to the cutoff corresponding to the tertiles of income. *The Economic Indicator of Ribeirão Preto (IERP)*[13] was built from the combined information of the variables acquisition of consumer goods and schooling of head of household, for which weights were assigned, as recommended by Barros and Victora[14]. The sum of the weights generated a score for each participant, and this variable was classified according to the cutoff corresponding to the respective distribution quintiles. Details on the procedure about how to format this variable can be found in Freitas and Moraes[13]. The *marital status* was defined according to the presence of a partner, regardless of formal union. Participants were also classified into two categories (yes/no) according to their insertion in the formal labor market (paid work in the last month prior to the interview).

Behavioral and health-related variables: The *habit of smoking* was classified into three categories (never smoker, former smoker and smoker). The *"alcohol addiction"* was classified based on the scores obtained in the questionnaire Alcohol Use Disorders Identification Test (AUDIT)[15], validated for use in Brazil by Lima et al.[16], considering the cutoff point "8" as a reference for the classification of dependency. The *physical activity pattern* (PAP) and the *average daily time sitting down* (sedentary behavior) were obtained from the International Physical Activities Questionnaire (IPAQ) (short version)[17], validated in Brazil by Matsudo et al.[18]. Information on self-reported health and their state of health when compared to their friends and family's health were obtained. The number of diseases (morbidity) was classified into three categories ("1-2", "3-4" and "5 and more"). The *hypertension* (HBP) was defined according to the history of the condition referred to by the doctor, or by an average of three consecutive measurements of blood pressure ≥ 140 x 90 mmHg for the measurements of systolic and diastolic pressure, respectively, or by regular use of antihypertensive medication[19]. The measurements were taken in the portable sphygmomanometers by Geratherm (Geratherm Medical AG, Geschwenda, Germany), which was classified in a dichotomous way "yes/no". The *diabetes mellitus* was also rated in a dichotomous way "yes/no", according to the medical history (previously diagnosed diabetes), and the ones who were unaware of the condition underwent an oral glucose tolerance test (OGTT). The glucose (mg/dL) were measured in capillary blood by the method of colorimetry by reflectance, through mobile handsets by Accutrend brand (Roche Diagnostics GmbH, Mannheim, Germany) at two moments: after 12 hours fasting and 2 hours after the ingestion of a standard solution containing 75 grams of pure glucose. The cutoff for the diagnosis followed the recommendations of the World Health Organization for the glucose measurements in capillary blood[20]. Participants were also asked about their history of hospitalization within the two years preceding the interview, and this variable was classified into two categories: "no/yes".

DATA PROCESSING

Data collection was performed by applying structured interviews in the homes of the eligible people by a staff of interviewers trained and experienced in the fieldwork of epidemiological studies. Before the definitive typing of the information, which was developed from double data entry, the quality control of the information was assessed through the replication of 12.5% of all interviews. As a measure of reproducibility for the variables included in the replication, the Kappa statistic was used[21], reaching the respective coefficients, values above 0.80.

STATISTICAL ANALYSIS

In the descriptive phase the prevalence of access to health services were estimated by score points and 95% confidence intervals (95%CI) according to sociodemographic, behavioral and health-related variables. At this stage, global associations were defined from the respective statistical values of "F", adopting a level of significance of $\alpha = 0.05$[22]. In the analytical phase the Poisson regression[23] was used to obtain the crude and adjusted prevalence ratios (PR), which were estimated by score points and 95%CI. The final models consisted on the casting of variables that, after simultaneous adjustment, presented $p < 0.05$. All analysis were carried out using the Stata software, version 10.1 for Windows. The calculation of all estimates took into account the effect of the sampling design (deff) using, for such, specific commands in Stata. All estimates were stratified by gender.

The EPIDCV project was approved by the Research Ethics Committee of the School of Nursing of Ribeirão Preto, Universidade de São Paulo and filed under No. 0725/2006. All participants signed a consent form, as recommended by the Resolution No. 196/96 of the National Health Council.

RESULTS

Regarding the characteristics of the sample (Table 1), the average age for men was 45.69 years of age and 47.97 for women. As for education, 57.86% of men and 54.23% of women had levels of formal schooling ≥ 08 years. Among men, most of them (66.31%) had a family income of ≥ $ 700.00, while among women, only 27.92% belonged to that stratum. This difference in socioeconomic level in relation to gender can also be detected for the IERP, observing from the 4th fifth of this indicator, the greater concentration of men and the diluted proportion of women, a fact also observed in the *working condition* scenario, with 82% of men and 54% of women reporting paid work in the previous month. The effect of the sampling design of the study (deff) was equivalent to 1.01581.

As to sociodemographic factors (Table 2) it is observed that the prevalence of use of health services was higher among women, in all age groups, and among men, it was directly related to age and indication of linear gradient. In both sexes, the respective prevalence declined with education, especially among men, as it was in relation to the IERP. Among those who had paid work (working condition), their respective prevalence was 44.39% for males and 71.97% for females. The age, income, IERP and working condition variables showed global association with the outcome only for males ($p < 0.05$).

Regarding behavioral and health-related factors, it is observed in Table 3 that, in both gender, the prevalence of use of health services were higher among former smokers, insufficiently active, who self-reported health as poor or very poor, when compared to friends and family (better than theirs), morbidity (number of reported diseases ≥ 5),

Table 1. Study population characteristics. Ribeirão Preto, São Paulo, Brazil, 2007. EPIDCV Project.

	Male (n_w = 995.7)			Female (n_w = 1475.0)		
	%	Median	95%CI	%	Median	95%CI
Age (in years)		45.69	43.95 – 47.24		47.97	46.73 – 49.30
30 – 39	34.03		29.20 – 38.86	21.85		18.04 – 25.66
40 – 49	27.78		23.48 – 32.07	33.15		29.58 – 36.72
50 – 59	18.79		15.60 – 21.99	21.70		18.24 – 25.16
60 and more	19.39		15.33 – 23.44	23.28		19.78 – 26.78
School education (in years)						
0 – 3	11.86		08.20 – 15.51	15.53		12.31 – 18.75
4 – 7	30.27		25.18 – 35.36	30.22		26.04 – 34.41
8 and more	57.86		51.30 – 64.42	54.23		48.97 – 59.50
Individual income (in R$)		1200.00	1000.00 – 1300.00		628.00	596.00 – 669.00
No income	17.12		13.26 – 20.98	45.98		42.51 – 49.45
1º third (50.00 – 700.00)	16.56		12.49 – 20.63	26.08		22.58 – 29.57
2º third (700.00 – 1,400.00)	29.96		24.92 – 34.99	14.07		11.36 – 16.78
3º third (> 1,400.00)	36.35		30.13 – 42.57	13.85		10.77 – 16.94
Economic Indicator of Ribeirão Preto (IERP)		628	596 – 669		597	576 – 625
1º fifth (≤ 413.2)	16.94		12.32 – 21.55	20.51		16.83 – 24.19
2º fifth (413.3 – 544)	18.95		14.84 – 23.05	19.72		16.27 – 23.18
3º fifth (544.1 – 684)	17.28		13.48 – 21.09	20.02		17.07 – 22.97
4º fifth (684.1 – 823.6)	22.74		18.80 – 26.68	17.79		14.36 – 21.23
5º fifth (> 823.6)	24.06		17.36 – 30.77	21.93		16.47 – 27.39
Marital status						
Without a partner	25.85		21.31 – 30.38	38.46		34.27 – 42.64
With a partner	74.14		69.61 – 78.68	61.53		57.35 – 65.72
Work condition						
No	17.53		13.73 – 21.32	45.63		42.13 – 49.13
Yes	82.46		78.67 – 86.26	54.36		50.86 – 57.86

n_w: weighted sample.

Table 2. Health services access prevalence and 95% confidence intervals according gender and socio-demographic status. Ribeirão Preto, São Paulo, Brazil, 2007. EPIDCV Project.

	Male (n_w = 995.7)		Female (n_w = 1475.0)	
	Access		Access	
	No % (95%CI)	Yes % (95%CI)	No % (95%CI)	Yes % (95%CI)
Age (years)*				
30 – 39	61.23 (52.78 – 69.04)	38.77 (30.96 – 47.22)	27.33 (18.57 – 38.27)	72.67 (61.73 – 81.43)
40 – 49	51.05 (41.08 – 60.94)	48.95 (39.06 – 58.92)	31.16 (24.37 – 38.87)	68.84 (61.13 – 75.63)
50 – 59	45.49 (32.03 – 59.64)	54.51 (40.36 – 67.97)	18.90 (12.16 – 28.17)	81.10 (71.83 – 87.84)
60 and more	31.38 (21.55 – 43.22)	68.62 (56.78 – 78.45)	20.50 (13.58 – 29.73)	79.50 (70.27 – 86.42)
School education (years)				
0 – 3	48.47 (35.26 – 61.89)	51.53 (38.11 – 64.74)	17.69 (11.10 – 27.00)	82.31 (73.00 – 88.90)
4 – 7	43.50 (35.47 – 51.87)	56.50 (48.13 – 64.53)	24.73 (18.74 – 31.89)	75.27 (68.11 – 81.26)
8 and more	55.25 (47.16 – 63.07)	44.75 (36.93 – 52.84)	28.42 (21.61 – 36.38)	71.58 (63.62 – 78.39)
Individual income, in tertiles (R$)*				
No income	23.75 (15.12 – 35.25)	76.25 (64.75 – 84.88)	22.30 (16.80 – 28.97)	77.77 (71.03 – 83.20)
1º third (50.00 – 700.00)	45.11 (35.88 – 54.68)	54.89 (45.32 – 64.12)	25.90 (19.03 – 34.19)	74.10 (65.81 – 80.97)
2º third (700.00 – 1,400.00)	48.98 (39.93 – 58.10)	51.02 (41.90 – 60.07)	33.54 (23.21 – 45.74)	66.46 (54.26 – 76.79)
3º third (> 1,400.00)	69.98 (60.15 – 78.26)	30.02 (21.74 – 39.85)	27.35 (15.63 – 43.34)	72.65 (56.66 – 84.37)
Economic indicator of Ribeirão Preto, in quintiles*				
1º fifth (≤ 413.2)	40.33 (30.34 – 51.19)	59.67 (48.81 – 69.66)	22.08 (15.62 – 30.25)	77.92 (69.75 – 84.38)
2º fifth (413.3 – 544)	41.45 (31.26 – 52.42)	58.55 (47.58 – 68.74)	19.18 (12.00 – 29.23)	80.82 (70.77 – 88.00)
3º fifth (544.1 – 684)	42.26 (31.56 – 53.75)	57.74 (46.25 – 68.44)	24.18 (16.82 – 33.48)	75.82 (66.52 – 83.18)
4º fifth (684.1 – 823.6)	55.45 (42.51-67.69)	44.55 (32.31 – 57.49)	26.79 (18.41 – 37.26)	73.21 (62.74 – 81.59)
5º fifth (> 823.6)	76.58 (62.63 – 86.45)	23.42 (13.55 – 37.37)	37.03 (23.88 – 52.43)	62.97 (47.57 – 76.12)

Table 2. Continuation.

	Male (n_w = 995.7)		Female (n_w = 1475.0)	
	Access		Access	
	No % (95%CI)	Yes % (95%CI)	No % (95%CI)	Yes % (95%CI)
Marital status				
Without partner	42.94 (32.75 – 53.76)	57.06 (46.24 – 67.25)	28.75 (22.79 – 35.55)	71.25 (64.45 – 77.21)
With partner	52.54 (46.42 – 58.58)	47.46 (41.42 – 53.58)	22.85 (17.81 – 28.83)	77.15 (71.17 – 82.19)
Work condition*				
No	24.50 (15.80 – 35.93)	75.50 (64.07 – 84.20)	22.29 (16.78 – 28.98)	77.71 (71.02 – 83.22)
Yes	55.61 (49.81 – 61.26)	44.39 (38.74 – 50.19)	28.03 (22.32 – 34.56)	71.97 (65.44 – 77.68)

*$p < 0.05$ for F statistic – male; n_w: weighted sample.

hypertension, diabetes mellitus, and history of hospitalization over the last 2 years. In males, the variables: average daily sitting down time (min/day), self-reported health, health status when compared to friends and family, morbidity, hypertension, and history of hospitalization over the past two years showed overall association with the outcome ($p < 0.05$). In females, statistically significant global associations were found for the variables: self-reported health, health status when compared to family, morbidity, hypertension, diabetes mellitus, and history of hospitalization over the last two years.

Respectively, in Tables 4 and 5, crude and adjusted prevalence ratios for males and females are presented. For males (Table 4), after simultaneous adjustment, the variables: age, education, income, IERP, average daily sitting down time, diabetes mellitus, and history of hospitalization over the last two years had an independent effect on the outcomes; and the prevalence ratios for education, income and IERP presented a statistically significant linear trend ($p < 0.05$). The PR for education had a direct relation to the outcome and an inverse relation to the individual income and the IERP. In the second quarter of time sitting down (154.4 – 240 min/day) the PRs indicated a protective effect, in relation to the outcome. The PRs for hypertension, diabetes and hospital were, respectively, 24, 34 and 60% higher than the respective reference categories.

In females (Table 5), remained in the final models the following variables: self-reported health, hypertension, diabetes, and history of hospitalization over the last two years. Among women, the PR for diabetes, hypertension, and history of hospitalization were respectively 11, 21 and 17% higher than the respective reference categories.

Table 3. Health services access prevalence and 95%confidence intervals according gender, behavioral and health related factors. Ribeirão Preto, São Paulo, Brazil, 2007. EPIDCV Project.

	Male (n_w = 995.7)		Female (n_w = 1475.0)	
	Access		Access	
	No % (95%CI)	Yes % (95%CI)	No % (95%CI)	Yes % (95%CI)
Smoking habit				
Never smoked	54.12 (45.28 – 62.71)	45.88 (37.29 – 54.72)	26.08 (20.51 – 32.54)	73.92 (67.46 – 79.49)
Smoker	54.42 (44.00 – 64.46)	45.58 (35.54 – 56.00)	28.62 (20.57 – 38.30)	71.38 (61.70 – 79.43)
Former smoker	40.00 (31.46 – 49.19)	60.00 (50.81 – 68.54)	19.16 (13.07 – 27.19)	80.84 (72.81 – 86.93)
Alcohol Consumption				
Not addicted (0 – 7)	50.25 (43.51 – 56.98)	49.75 (43.02 – 56.49)	25.37 (20.94 – 30.38)	74.63 (69.62 – 79.06)
Addicted (8 – 40)	49.08 (40.74 – 57.47)	50.92 (42.53 – 59.26)	25.55 (14.94 – 40.15)	74.45 (59.85 – 85.06)
Physical activity pattern				
Insufficiently active	31.51 (15.06 – 54.41)	68.49 (45.59 – 84.94)	13.56 (34.00 – 41.14)	86.44 (58.86 – 96.60)
Active	50.12 (40.17 – 60.05)	49.88 (39.95 – 59.83)	26.18 (17.98 – 36.45)	73.82 (63.55 – 82.02)
Very active	50.87 (43.76 – 57.95)	49.13 (42.05 – 56.24)	25.46 (20.78 – 30.79)	74.54 (69.21 – 79.22)
Daily average sitting down time in a week (min/day)*				
1º fourth (15 – 154.3)	43.10 (32.96 – 53.84)	56.90 (46.16 – 67.04)	24.91 (17.48 – 34.20)	75.09 (65.80 – 82.52)
2º fourth (154.4 – 240)	59.44 (50.31 – 67.97)	40.56 (32.03 – 49.69)	26.39 (19.97 – 34.01)	73.61 (65.99 – 80.03)
3º fourth (240.1 – 360)	53.89 (41.43 – 65.88)	46.11 (34.12 – 58.57)	23.22 (14.80 – 34.51)	76.78 (65.49 – 85.20)
4º fourth (> 360)	41.67 (31.86 – 52.18)	58.33 (47.82 – 68.14)	26.11 (19.66 – 33.79)	73.89 (66.21 – 80.34)
Self-referred health*†				
Excellent/Good	53.43 (47.21 – 59.53)	46.57 (40.47 – 52.79)	31.40 (25.30 – 38.22)	68.60 (61.78 – 74.70)
Regular	44.35 (34.38 – 54.80)	55.65 (45.20 – 65.62)	17.08 (12.45 – 22.98)	82.92 (77.02 – 87.55)
Bad/Terrible	13.37 (01.71 – 57.72)	86.63 (42.28 – 98.29)	12.52 (04.62 – 29.72)	87.48 (70.28 – 95.38)

Continue...

Table 3. Continuation.

	Male (n_w = 995.7)		Female (n_w = 1475.0)	
	Access		Access	
	No % (95%CI)	Yes % (95%CI)	No % (95%CI)	Yes % (95%CI)
Health status when compared to friends*				
Equal	53.27 (46.05 – 60.36)	46.73 (39.64 – 53.95)	27.79 (21.58 – 34.99)	72.21 (65.01 – 78.42)
Worse	51.39 (41.88 – 60.79)	48.61 (39.21 – 58.12)	26.65 (20.80 – 33.44)	73.35 (66.56 – 79.20)
Better	22.66 (11.64 – 39.46)	77.34 (60.54 – 88.36)	15.11 (08.87 – 24.56)	84.89 (75.44 – 91.13)
Health estatus when compared to family*†				
Equal	56.83 (50.27 – 63.17)	43.17 (36.83 – 49.73)	29.95 (23.36 – 37.50)	70.05 (62.50 – 76.64)
Worse	41.75 (28.60 – 56.19)	58.25 (43.81 – 71.40)	31.72 (24.07 – 40.49)	68.28 (59.51 – 75.93)
Better	40.94 (31.37 – 51.24)	59.06 (48.76 – 68.63)	16.71 (11.57 – 23.52)	83.29 (76.48 – 88.43)
Number of morbitidies*†				
None	58.25 (48.57 – 67.33)	41.75 (32.67 – 51.43)	39.21 (28.05 – 51.62)	60.79 (48.38 – 71.95)
1 – 2	53.35 (45.40 – 61.14)	46.65 (38.86 – 54.60)	30.90 (23.41 – 39.55)	69.10 (60.45 – 76.59)
3 – 4	42.29 (31.53 – 53.83)	57.71 (46.17 – 68.47)	20.72 (15.32 – 27.40)	79.28 (72.60 – 84.68)
5 and more	10.75 (03.16 – 30.74)	89.25 (69.26 – 96.84)	13.59 (07.19 – 24.19)	86.41 (75.81 – 92.81)
Hypertension*†				
No	56.39 (50.25 – 62.34)	43.61 (37.66 – 49.75)	30.63 (25.23 – 36.62)	69.37 (63.38 – 74.77)
Yes	36.15 (27.39 – 45.93)	63.85 (54.07 – 72.61)	19.42 (14.32 – 25.79)	80.58 (74.21 – 85.68)
Diabetes†				
No	54.82 (48.89 – 60.62)	45.18 (39.38 – 51.11)	29.86 (25.00 – 35.22)	70.14 (64.78 – 75.00)
Yes	40.88 (28.49 – 54.55)	59.12 (45.45 – 71.51)	08.39 (04.28 – 15.79)	91.61 (84.21 – 95.72)
Hospitalization over the last 2 years*†				
No	55.95 (49.87 – 61.85)	44.05 (38.15 – 50.13)	27.75 (23.22 – 32.78)	72.25 (67.22 – 76.78)
Yes	17.36 (08.95 – 30.98)	82.64 (69.02 – 91.05)	13.08 (07.26 – 22.41)	86.92 (77.59 – 92.74)

*$p < 0.05$ for F statistic – male; †$p < 0.05$ for F statistic – female; n_w: weighted sample.

Table 4. Crude and adjusted prevalence ratios and 95% confidence intervals in male. Ribeirão Preto, São Paulo,Brazil, 2007. EPIDCV Project.

	Crude PR	95%CI	Adjusted PR	95%CI
Age (years)				
30 – 39	1	-	1	-
40 – 49	1.26	0.94 – 1.70	1.52	1.15 – 2.00
50 – 59	1.41	1.02 – 1.95	1.50	1.01 – 2.25
60 and more	1.77	1.35 – 2.33	1.53	1.05 – 2.24
School education (years)				
0 – 3	1	-	1*	-
4 – 7	1.10	0.81 – 1.48	1.32	1.02 – 1.71
8 and more	0.87	0.62 – 1.21	1.48	1.10 – 1.99
Individual income, in tertiles (R$)				
No income	1	-	1*	-
1º third (50.00 – 700.00)	0.72	0.58 – 0.90	1.07	0.79 – 1.43
2º third (700.00 – 1,400.00)	0.67	0.53 – 0.84	0.97	0.69 – 1.36
3º third (> 1,400.00)	0.39	0.29 – 0.54	0.50	0.32 – 0.78
Economic indicator of Ribeirão Preto, in quintiles				
1º fifth (≤ 413.2)	1	-	1*	-
2º fifth (413.3 – 544)	0.98	0.75 – 1.29	1.08	0.80 – 1.43
3º fifth (544.1 – 684)	0.97	0.74 – 1.26	0.96	0.70 – 1.33
4º fifth (684.1 – 823.6)	0.75	0.54 – 1.03	0.85	0.61 – 1.18
5º fifth (> 823.6)	0.39	0.23 – 0.66	0.49	0.28 – 0.85
Average daily sitting down time in a week (min/day)				
1º fourth (15 – 154.3)	1	-	1	-
2º fourth (154.4 – 240)	0.71	0.54 – 0.95	0.68	0.51 – 0.90
3º fourth (240.1 – 360)	0.81	0.58 – 1.14	0.88	0.62 – 1.25
4º fourth (> 360)	1.03	0.79 – 1.34	1.05	0.81 – 1.35
Hypertension				
No	1	-	1	-
Yes	1.46	1.20 – 1.78	1.24	0.96 – 1.59
Diabetes				
No	1	-	1	-
Yes	1.31	1.01 – 1.69	1.34	1.06 – 1.69
Hospitalization over the last 2 years				
No	1	-	1	-
Yes	1.88	1.55 – 2.27	1.60	1.32 – 1.94

RP: prevalence ratio; *p value for linear trends < 0.05.

Table 5. Crude and adjusted prevalence ratios and 95% confidence intervals in female. Ribeirão Preto, São Paulo, Brazil, 2007. EPIDCV Project.

	Crude PR	95%CI	Adjusted PR	95%CI
Self referred health				
Excellent/Good	1	-	1	-
Regular	1.21	1.07 – 1.36	1.16	1.03 – 1.32
Bad/Terrible	1.28	1.08 – 1.50	1.12	0.94 – 1.33
Hypertension				
No	1	-	1	-
Yes	1.16	1.05 – 1.28	1.11	1.00 – 1.24
Diabetes				
No	1	-	1	-
Yes	1.31	1.19 – 1.43	1.21	1.10 – 1.33
Hspitalization over the last 2 years				
No	1	-	1	-
Yes	1.20	1.08 – 1.33	1.17	1.04 – 1.31

RP: prevalence ratio.

DISCUSSION

In the present study, the prevalence of use of health care services was higher among women than among men, in all age groups. In the multivariate models, the variables hypertension, diabetes mellitus and hospital admissions over the last two years remained independently associated with the outcome, in both gender, especially among men whose sociodemographic variables such as age, education and income, in addition to daily average sitting down time in min/day, also remained in the final model.

The methodological rigor adopted in the different stages of the study, as well as the high response rate (82.1%) allow one to assume that the findings were not a result of the selection, confusion or measurement bias.

The application of the epidemiological method in the identification of the profile of health services' users is fundamental, for it contributes with important input for the recognition of the characteristics of the demand, for the assessment and reassessment of the actions and for the decision-making by its managers. In this context, analytic epidemiological population-based studies using representative samples add relevant information about the pattern of service usage, enabling the identification of the main risk factors, and which can support specific planning of health actions at local levels[8,24-26].

In the present study, the highest prevalence of access to health services in females, as well as an increased demand with the advancing age, confirms similar results reported in literature[27-31]. Garbinato et al.[32], in an epidemiological population-based study (n = 1,954) conducted, between 2002 and 2003 in Canoas, metropolitan region of Porto Alegre, Rio Grande do Sul, reported that the age range between 60 years of age or older showed a prevalence ratio of high magnitude and statistically significant association with the use of health services (PR = 4.14; 95%CI 2.07 – 8.25). Lima-Costa et al.[33] claim that it is not age itself that determines the use of medical services, but the health condition instead, especially the prevalence of chronic diseases. Indeed, in this study, the adjustment for age did not withdraw the strength of association with the outcome variables: hypertension, diabetes mellitus and hospitalization.

Mendoza-Sassi et al.[34] point out that studies carried out in several countries indicate that women in fertile age have a higher prevalence of access to health services, due to gynecological and obstetric problems . Moreover, they perceive more easily the health risks than men, because they have greater access to these information[5]. According to Verbrugge and Wingard[35], inequalities in the profile of health service utilization are not attributed only to reproductive health issues. Women tend to consider their health in a more negative way and they also report greater number of chronic diseases, while men, when looking for medical assistance, have more severe and lethal diseases. To Bastos et al.[9], men seek the health system mainly by means of specialized care resulting from worsening or complications of the disease, as a consequence of the delay in care in previous levels of attention and, therefore, generating a greater cost to the health system.

As to the income, the findings presented here confirm those of Dias-da-Costa et al.[29], who detected high prevalence of medical consultation in individuals of lower socioeconomic status (inverse relation to the outcome). However, some studies indicate that the use of medical services is higher among those of higher socioeconomic status, favoring the most privileged layers[8,10,26,27,31].

In this study, education presented direct relation and independent association with the use of health services, only in males. Capilheira and Santos[8] reveal controversies in the relation between education and the use of services. According to these authors, the increase on education sometimes contributes to the increase in demand, and sometimes it does not influence it, as also reported by Costa and Facchini[27], who found a statistically significant association between low education (illiterate) and the use of medical services (OR = 4.50; 95%CI 1.47 – 13.77).

Regarding the participation in the labor market, the results presented here confirm the findings of Goldbaum et al.[30], who reported that the use of health services within the 15 days previous to the interview, in a population covered by the family health strategy was higher to inactive (18.4 %) and unemployed people (12.3%) than for informal/self-employed (12.2%) and employed (11.8%) ones. However, in the analysis phase, the results found by these authors revealed that the respective prevalence ratios for the variable "condition

of work", lost statistical significance: inactive (PR = 1.23; 95%CI 0.95 – 1.58); informal/self-employed (PR = 1.09; 95%CI 0.75 – 1.58) and unemployed (PR = 1.03; 95%CI 0.64 – 1.67). In this study, the variable "condition of work" was not part of the final models (p > 0.05) in both gender, probably in order to, on one hand, include the variables related to socioeconomic status, such as individual income and the IERP in males, but mainly due to the strength of the association with outcome variables such as hypertension, diabetes mellitus and hospitalization history.

As for behavioral factors, the results presented here are similar to those reported by other authors. In both gender, the prevalence of use of services was higher among former smokers, which is consistent with the findings of Costa et al.[26], though smoking did not remain in the final models. Capilheira and Santos[8] also observed that the prevalence of medical consultations was higher among former smokers (60.4%) and their respective prevalence ratio was statistically significant (PR = 1.12; 95%CI 1.04 – 1.48) in partial adjustment models (behavioral and health-related variables), with the exception of the sociodemographic variables. The highest prevalence of demand for health services among former smokers may be a reflection of reverse causality bias, under the assumption that access to health services may have led to the interruption of the habit, especially in people with diseases associated with smoking . If, on the one hand, the bias of reverse causality constitutes a limitation inherent to cross-sectional studies, the "directionality" of effect of the variables that remained in the final models presented here does not seem to result from this bias.

In relation to alcohol consumption, the prevalence of use of the services was higher among addicted males, although this variable did not remain in the final models, in both gender. These results are consistent with the findings obtained by Costa et al.[26]. Boing et al.[10] reported that alcohol addiction was associated to the use of health services (PR = 1.12; 95%CI 1.01 – 1.23) in multivariate models, in which were included sociodemographic, behavioral and health-related variables. On the other hand, Costa and Facchini[27] found that people who consumed alcoholic beverages consistently showed lower frequency of medical consultations, possibly due to poor results regarding the service and/or the need for specific programs to increase its uptake.

It should be emphasized that during the modeling process, the potential confounding and/or modification effect, in different studies, has been assessed by the inclusion of different sets of factors, and/or different modeling techniques. This fact may limit, at times, the comparison between studies, given that the presence of factors with strong potential association with outcomes may promote the exclusion, in the final models, of "weak predictors". In spite of these limitations, however, the variables: hypertension, diabetes mellitus, and history of hospitalization remained, in both gender, independently associated to the search for health services, even after simultaneous adjustment for sociodemographic, behavioral and health related factors. These findings were also confirmed by other authors[26,27,29,31]. However, although stratification by gender may

have contributed to the reduction of the statistical power of the study, different sets of factors associated to the search for health services, in both men and women, justify the application of modeling techniques stratified by gender.

The results of this study suggest four relevant questions: (1) significant differences in the demand for health services evidence women among the ones who consume these services the most, which may result not only from their greater perception of health status, but also from the historic setting of primary care services which, in Brazil, still prioritizes maternal and child care; (2) although sociodemographic variables are associated with the seek for health services, among men, it did not become evident among women, which may certainly be due to the indiscriminate demand for these services by women, regardless of age, education and income; (3) as to the search for health services, 60% of the demand, among men, is associated to hospitalizations, against only 17% among women, a fact that reinforces the findings of Verbrugge and Wingard[35], in the sense that men tend to search for ambulatory services due to diseases in more advanced states or of worse prognosis; and (4) as for the weight of different sets of gender-specific factors, associated to the use of the health services, chronic events such as hypertension and diabete mellitus, next to hospitalization history, remain independently associated to the outcomes, in both gender.

From what was exposed, it appears that the planning of health care on an ambulatory level, especially regarding primary care, should include strategies to attract males, through the development of specific actions that could serve to stimulate primary prevention of chronic diseases such as the standardization of screening for prostate cancer, similar to the established routines for the Pap test. These initiatives, certainly, besides contributing to the primary prevention of prostate cancer could also contribute to the primary or secondary prevention of hypertension and diabetes mellitus in this population stratum, minimizing individual and collective consequences of cardiovascular diseases, such as the ischemic heart disease and strokes.

The progressive increase in the prevalence of diabetes and hypertension, which, by themselves, constitute risk factors for ischemic heart disease and stroke, reflects the progressive population aging in Brazil as a whole, and especially in southeastern Brazil, including Ribeirão Preto, as recently reported by Moraes and Freitas[36] and Moraes et al.[37].

CONCLUSION

The results of the study indicate the need for adequacy and planning of health services, through greater effective actions in order to attract more males, also becoming imperative to the continuous evaluation of programs for the detection and control of diabetes mellitus and hypertension, aiming at the primary prevention of terminal cardiovascular events, which will certainly lead to reasoning in the use of health care resources destined to the city of Ribeirão Preto, São Paulo.

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