DOI: 10.1590/1980-5497201700010013

ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Prevalence and factors associated with self-reported disability: a comparison between genders

Prevalência e fatores associados ao autorrelato de deficiência: uma comparação por sexo

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ABSTRACT: ***Objective:*** To estimate the prevalence of disability and its association with sociodemographic and health characteristics stratified by sex. ***Methods:*** This is a cross-sectional study with a probabilistic sample including 4,048 residents aged ≥ 18 years in two health districts of Belo Horizonte (MG), Brazil, during the period from 2008 to 2009. The outcome variable "disability" was established based on self-reported problems in body functions or structures. Sociodemographic characteristics ("sex," "age," "skin color," "marital status," "years of schooling," and "family income") and health ("reported morbidity," "health self-assessment," "quality of life," and "life satisfaction") were the explanatory variables. We applied the multivariate decision tree analysis by using the Chi-square Automatic Interaction Detector algorithm. ***Results:*** The overall prevalence of disability corresponded to 10.4% and it was higher in females (11.9%; confidence interval – 95%CI 10.2 – 13.6) than in males (8.7%; 95%CI 6.8 – 10.5). In the multivariate analysis, "age" and "morbidity" in females, and "low educational level" and "poor health self-assessment" in males were the variables that best discriminated disability. Disability self-reporting was more frequent among women of working age (40 to 59 years-old) and with lower incomes, as well as in men with lower educational levels and incomes. With regard to health conditions, the highest disability percentages were seen among subjects of both genders that reported three or more diseases and worsened perception of health. ***Conclusion:*** Results reinforce the need for a distinct approach, since women of working age and men with lower educational level are more vulnerable to the occurrence of disability.

Keywords: Disability. Disabled persons. Prevalence. Risk factors. Sex. Self report. Multivariate analysis.

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Conflict of interests: nothing to declare – **Financial support:** National Council for Scientific and Technological Development (409688/2006-1), *Fundação de Amparo à Pesquisa do Estado de Minas Gerais* (APQ-00677-08), and *Fundo Nacional de Saúde/ Ministério da Saúde* (FNS-Process no. 25000.102984/2006-97).

RESUMO: ***Objetivo:*** Estimar a prevalência de deficiência e sua associação com características sociodemográficas e de saúde, estratificadas por sexo. ***Métodos:*** Estudo transversal com amostra probabilística de 4.048 residentes com idade ≥ 18 anos em dois distritos sanitários de Belo Horizonte (MG) durante o período 2008–2009. A variável resposta "deficiência" foi definida com base no autorrelato de problema nas funções ou nas estruturas do corpo. As variáveis explicativas foram sociodemográficas ("sexo", "idade", "cor de pele", "estado civil", "anos de estudos" e "renda familiar") e de saúde ("morbidade referida", "autoavaliação de saúde", "qualidade de vida" e "satisfação com a vida"). Empregou-se a análise multivariada pela árvore de decisão, utilizando-se o algoritmo *Chi-square Automatic Interaction Detector*. ***Resultados:*** A prevalência global de deficiência foi de 10,4%, maior no sexo feminino (11,9%; intervalo de confiança — IC95%: 10,2–13,6) do que no masculino (8,7%; IC95%: 6,8–10,5). Na análise multivariada, as variáveis que melhor discriminaram a deficiência foram "idade" e "morbidade" no sexo feminino, "baixa escolaridade" e "pior autoavaliação de saúde" no sexo masculino. O autorrelato de deficiência foi mais frequente entre mulheres em idade produtiva (40 a 59 anos) e de menor renda, e entre homens de menor escolaridade e renda. Com relação às condições de saúde, os maiores percentuais de deficiência foram observados, para ambos os sexos, entre aqueles que relataram três ou mais doenças e pior percepção de saúde. ***Conclusão:*** Os resultados reforçam a necessidade de atenção diferenciada, uma vez que mulheres em idade produtiva e homens com menor escolaridade são mais vulneráveis à ocorrência de deficiência.

Palavras-chave: Deficiência. Pessoas com deficiência. Prevalência. Fatores de risco. Sexo. Autorrelato. Análise multivariada.

INTRODUCTION

Disability is part of the human condition and can be acquired throughout a person's entire life[1]. It has a broad definition that can vary based on the adopted theoretical model. Although some studies often use "disability" and "impairment" interchangeably, these terms represent different constructs. The definition of disability adopted in this study refers to "problems in body functions or structures as important deviation or loss"[2]. Body functions are composed of physiological functions of the body and the body structures comprises anatomic body parts such as organs, limbs, and their components[2]. Body functions and structures belong to the domain of functioning and disability in the International Classification of Functioning, Disability and Health (ICF) framework: "Disability is the generic term for impairments, activity limitations, and participation restrictions. It indicates the negative aspects of the interaction between a person (with a health condition) and his/her contextual factors (environmental and personal factors)"[2]. This discussion have been conducted by many different researchers and by the World Health Organization (WHO), who has released the classification to standardize this terminology[1,2].

The 2010 World Report on Disability[1] estimates that more than one billion people – 15% of the population – lives with some kind of disability, either a transitory or a permanent

disability, and it occurs more often among women[1,3]. In Brazil, its prevalence varies from 6.2%[4] to 24.0%[5], depending on the investigated population and criteria adopted for disability definition[6,7]. In spite of the dissimilarities of definitions, most studies agree that disability prevalence may increase in the next decades owing to the aging population and increase of chronic conditions, combined with the increasing demand for medical services and rehabilitation[1].

According to literature, the health condition of disabled persons presents a decreasing gradient, in which the socioeconomic status (SES) is measured by schooling, income, and socioeconomic class, regardless of age and sex[1,8]. The most recent research in this area reinforces the inequality issue that disabled persons face in health, rehabilitation, education, work, support, and care[1,9].

From the point of view on inequality among the sexes, more vulnerability is seen among women who live alone, who are black[5], and who have limited access to education and health care[1,9-11]. Ageing makes disability worse, especially among older female subjects, whose high prevalence is attributed to different comorbidity and secondary conditions, disability severity, and to the lack of health care access[1,11,12].

The expansion of the aging population in the urban environment, associated with epidemiological transition, influenced the proportional increase of subjects with disability[1] — which is seen in studies including 40-year-old subjects or older[5,6]. In urban areas, this situation — aging population, low SES, and higher frequency of disability self-reporting among women — is worsened by the inadequacy of infrastructure services such as paving, lighting, and transportation. In Brazil, studies[4-6,13,14] portraying disability do not stratify subjects by sex.

Focusing on the differences between men and women, this research intended to estimate the prevalence of disability and its association with socioeconomic and health characteristics.

METHODS

STUDY DESIGN AND SAMPLE

This is an observational and cross-sectional study that was developed using information from the household survey named *"Saúde em Beagá"* [Health in Beagá], which was carried out in 2008–2009 by researchers from the Urban Health Observatory from Belo Horizonte of the *Universidade Federal de Minas Gerais* (UFMG), Belo Horizonte (MG), Brazil. Data was collected in two of the nine health districts of Belo Horizonte: Oeste and Barreiro. More information about this survey can be obtained in other publications in more detail[15-17].

A probabilistic sampling was conducted and stratified by conglomerates in three stages: census tract, domicile, and individual. Strata were defined based on the Health Vulnerability Index (IVS)[18] used by the Department of Health of Belo Horizonte to classify the census

tracts into areas of low, medium, high, and very high health vulnerability. The final sample was composed of 4,048 adults. In each household, an adult resident (≥ 18 years-old) was chosen to answer the questionnaire.

VARIABLES

Dependent variable

In this study, the dependent variable — disability (DIS) — was operationalized based on the following question: Do you have a limitation, difficulty, or disability (motor, visual, hearing, or others)? The answers were codified in "no" (absence of DIS) and "yes" (presence of DIS).

Independent variables

The independent variables were grouped into two blocks:

1. Sociodemographic characteristics: sex; age divided into age groups: 18 to 30 years, 31 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 69 years and 70 years or older; skin color: white, non-white; marital status: single, married/living in common law, separated and widowed; educational level in years of study: illiterate, 1 to 4, 5 to 8, 9 to 11 and 12 or more; family income in number of minimum wages: less than 2 minimum wages, from 2 to less than 3, from 3 to less than 5, and 5 minimum wages or more;
2. Health characteristics:
    - Reported morbidity: obtained after reporting the presence of disease through the question: Has a physician or other health professional ever told you that you have one of the following chronic diseases? The list was composed of 15 diseases, and 4 categories were created for each variable based on the answers according to the presence of such diseases:
        0. none;
        1. one;
        2. two;
        3. three or more morbidities;
    - Health self-assessment: through the question: Overall, how is your health? Answers were grouped by "good" (very good or good) and "poor" (reasonable, poor or very poor);
    - Quality of life: measured by means of the question: How do you qualify your quality of life? Answers were grouped by "very poor to poor", "nor poor nor good", "good to very good";

- Life satisfaction: assessed by means of the "Life Satisfaction Scale"[19] and measured using the question: Regarding satisfaction with your *current life*, which step do you find yourself at *today*? The answers were divided into "unsatisfied" (steps 1 to 5) and "satisfied" (steps 6 to 10).

DATA ANALYSIS

Descriptive analyses were performed using distributions of frequency, means, and standard deviation. The prevalence of DIS and its respective 95% confidence intervals were estimated based on sociodemographic and health characteristics. The association between DIS with independent variables was measured by means of Pearson's χ^2 test, stratified by sex.

The adjusted Wald test was used for sex comparison. The Stata 12.0 software was used, taking into consideration the sampling design and a 5% significance level. Then, a multivariate analysis was conducted using the decision tree technique and applying the Chi-square Automatic Interaction Detector (CHAID) algorithm. This method consists of successive divisions into data group to make the groups more homogeneous regarding the outcome variable.

Two models have been proposed: a tree on sociodemographic variables and another on health variables — both with forced entry of the "sex" variable in Knot 1. The value $p \leq 0.05$ was adopted in bivariate analyses to add variables in the model, with the exception of the "skin color" variable, which was included owing to its epidemiological relevance[5]. The value of $p \leq 0.05$ of the χ^2 test through Bonferroni's correction was adopted as a tree stop criterion. Adjustment of final models was assessed through risk estimation that compares the difference between the expected value and the value seen through the model[20].

The decision tree analysis was completed in the Statistical Package for the Social Sciences (SPSS) program, version 19.0 (IBM Corporation, Armonk, United States), without considering the complexity of the sampling design. One hundred and eleven subjects (2.7%) presenting incomplete data on the variables used in this study were excluded.

The Research Ethics Committee of the School of Medicine from UFMG (ETIC no. 253/06) approved this research. All participants signed the free informed consent.

RESULTS

Among 4,048 study participants, 53.1% were women with an average age of 40.9 ± 16.1 years. Of these subjects, 10.4% (95%CI 9.1–11.7%) reported some kind of DIS, which was higher among females (11.9%; 95%CI 10.2–13.6) than among males (8.7%; 95%CI 6.8–10.5) (p-value = 0.011). Among the reported DIS types, physical disability was the most prevalent (6.6%), followed by visual (2.1%), and hearing (1.9%) (data are not shown) disabilities.

With regard to sociodemographic characteristics in the bivariate analysis, all variables were associated with DIS, except family income for males and skin color for both strata. A positive association between DIS and age range was observed, as well as higher prevalence among women aged 70 years or older. In both sexes, the SES, represented by educational level and income, presented a decreasing gradient with prevalence of DIS. For men, the highest prevalence of DIS (47.6%) was seen among the illiterate, with adjacent p-value ($p = 0.051$). According to the sociodemographic variables when comparing both sexes, higher prevalence of DIS was seen in non-white women, who were separated and widowed, with an educational level of more than 12 years when compared with men showing the same characteristics (Table 1).

Regarding health, gradual increase of DIS prevalence was seen in both sexes after the increase in the number of reported morbidities, especially in subjects with three or more diseases. In both strata, DIS prevalence was higher among those that negatively assessed their health and quality of life (QL), whereas among those who are not satisfied with their lives, the DIS prevalence was higher only among women. In the sex comparison, higher prevalence of DIS was seen in women with better health self-assessment and QL if compared with men showing the same characteristics (Table 2).

According to the decision tree, in the multivariate analysis for sociodemographic characteristics (Figure 1), the variables that best discriminated DIS were age for women and educational level for men. Women aged between 40 and 59 years and with family income lower than 5 minimum wages had a 18.5% probability of reporting DIS, whereas those in the same age range and with income ≥ 5 minimum wages presented only 8.6%. Men with schooling from 0 to 4 years and family income lower than 5 minimum wages had a 24.1% probability of reporting DIS, whereas men with the same educational level and income higher than 5 minimum wages showed a lower probability (5.6%).

With regard to health, the variables that best discriminated DIS were reported morbidity for women and health self-assessment for men (Figure 2). Women with three or more diseases and poor to very poor QL had a 47.1% probability of reporting DIS, whereas those with three or more diseases and QL reported as nor good nor poor and good/very good presented 31.3% and 22.7% chances, respectively. Men with poor health self-assessment and who reported three or more diseases had a 35.6% probability of reporting DIS, whereas those who reported none, one or two morbidities indicated lower probability (18.5%). Decision tree models indicated good adjustment, with a risk estimative of 0.12 (standard error = 0.005).

DISCUSSION

This study has investigated the association of DIS with socioeconomic and health characteristics between men and women. Whereas an older age and low family income were associated with DIS in both sexes, low educational levels were reported only among men. DIS self-reporting was more frequent among women of working age (40 to 59 years of

Table 1. Prevalence of disability according to sociodemographic characteristics stratified by sex. *Estudo Saúde em Beagá*, 2008–2009.

Variables	Female			Male			p-value[b]
	n* (%)**	%**	95%CI**	n* (%)**	%**	95%CI**	
Age range (years)							
18 to 30	572 (32.0)	3.5	(1.6 – 5.4)	468 (34.9)	2.9	(1.0 – 4.7)	0.622
31 to 39	433 (17.8)	7.2	(3.7 – 10.6)	283 (18.1)	7.3	(3.3 – 11.2)	0.981
40 to 49	471 (19.8)	15.7	(10.8 – 20.6)	316 (18.6)	12.8	(7.2 – 18.3)	0.384
50 to 59	406 (15.0)	18.2	(13.1 – 23.3)	265 (14.9)	12.3	(7.3 – 17.3)	0.135
60 to 69	278 (8.7)	19.6	(14.3 – 24.9)	175 (8.2)	14.0	(6.2 – 21.6)	0.215
70 or older	229 (6.7)	29.4	(21.9 – 36.9)	152 (5.3)	19.6	(2.6 – 26.5)	0.056
p-value[a]			< 0.001			< 0.001	
Skin color[§]							
White	948 (42.2)	10.5	(7.9 – 13.0)	593 (38.0)	9.8	(6.4 –13.0)	0.724
Non-white	1.428 (57.8)	13.1	(10.7 – 15.4)	1.061 (62.0)	8.1	(6.1 –10.0)	0.001
p-value[a]			0.154			0.338	
Marital status							
Single	694 (34.2)	6.9	(4.7 – 9.1)	520 (39.8)	6.3	(3.3 – 9.2)	0.733
Married/living common law	1.155 (50.1)	12.0	(9.6 – 14.4)	1.000 (54.2)	10.9	(8.5 – 13.2)	0.496
Separated	243 (7.3)	18.8	(12.5 – 25.0)	90 (4.3)	5.6	(1.3 – 25.0)	< 0.001
Widowed	297 (8.4)	26.1	(18.9 – 33.3)	49 (1.7)	6.0	(0.5 – 11.3)	< 0.001
p-value[a]			< 0.001			0.029	
Educational level (years)[§]							
Illiterate	76 (1.7)	20.5	(9.1 – 31.8)	29 (1.0)	47.6	(23.0 – 72.1)	0.051
1-4	598 (19.5)	25.5	(20.7 – 30.3)	354 (16.4)	18.5	(13.1 – 23.9)	0.054
5-8	506 (20.6)	12.5	(8.7 – 16.2)	371 (22.4)	10.2	(5.8 – 14.5)	0.432
9-11	809 (36.6)	7.2	(5.0 – 9.4)	600 (36.7)	6.5	(3.9 – 9.2)	0.693
12 or more	396 (21.6)	6.5	(3.4 – 9.6)	305 (23.5)	2.3	(0.5 – 4.1)	0.028
p-value[a]			< 0.001			< 0.001	
Family income (mw)[§§]							
Less than 2	738 (23.4)	14.6	(11.4 – 17.7)	318 (15.0)	12.7	(7.9 – 17.4)	0.507
2 to 3	540 (22.0)	13.7	(9.7 – 17.7)	375 (19.0)	9.6	(6.4 – 12.8)	0.119
3 to 5	493 (23.6)	13.4	(9.6 – 17.2)	403 (24.6)	9.8	(5.8 – 13.9)	0.172
5 to 10	335 (16.7)	8.1	(4.9 – 11.3)	308 (21.7)	6.1	(9.9 – 10.2)	0.450
10 or more	225 (14.3)	5.9	(1.8 – 10.1)	215 (19.7)	7.1	(2.9 – 11.4)	0.724
p-value[a]			0.012			0.256	

[a]χ^2 test: comparison of disability prevalence according to the characteristics assessed for each sex stratum; [b]adjusted Wald test: comparison between sexes of disability prevalence for sociodemographic characteristics; [§]< 10 missing; mw: minimum wages; *number of subjects in the non-weighed sample; **weighed proportions and prevalence; CI: confidence interval.

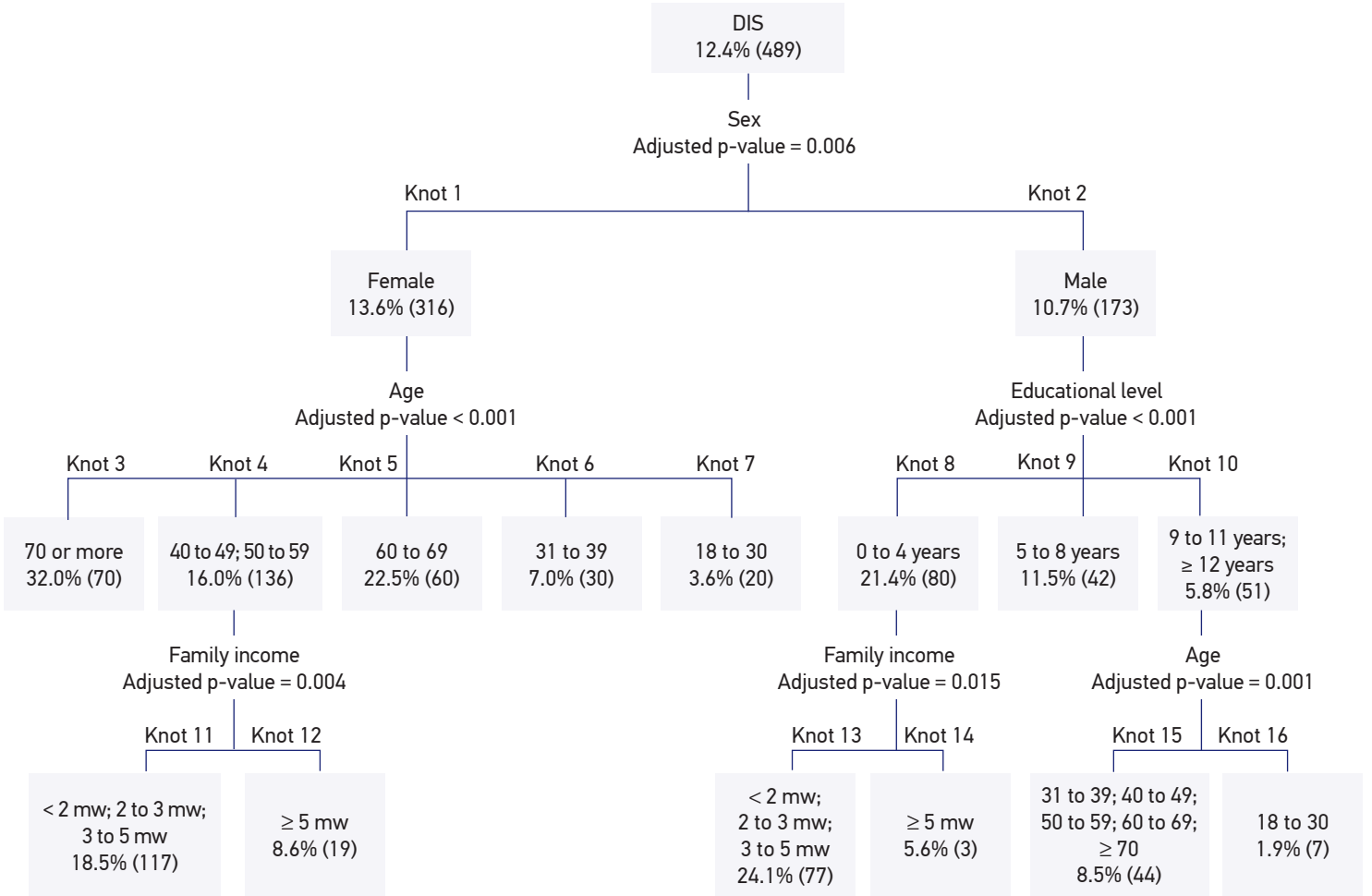
age) and with lower incomes, as well as in men with lower educational levels and incomes. With regard to health conditions, the higher the report of comorbidity and the worse the health perception, the higher the frequency of DIS in both sexes.

General prevalence of DIS found in this study was 10.4%, higher in females. According to the WHO, approximately 10.0% of a country's population has some kind of DIS[1]. This datum is similar to the current literature[4-6,12-14,21,22], although it varied from 6.2% to 24% in other Brazilian studies[4-6,13,21]. Differences in the comparisons

Table 2. Prevalence of disability according to health characteristics stratified by sex. *Estudo Saúde em Beagá*, 2008–2009.

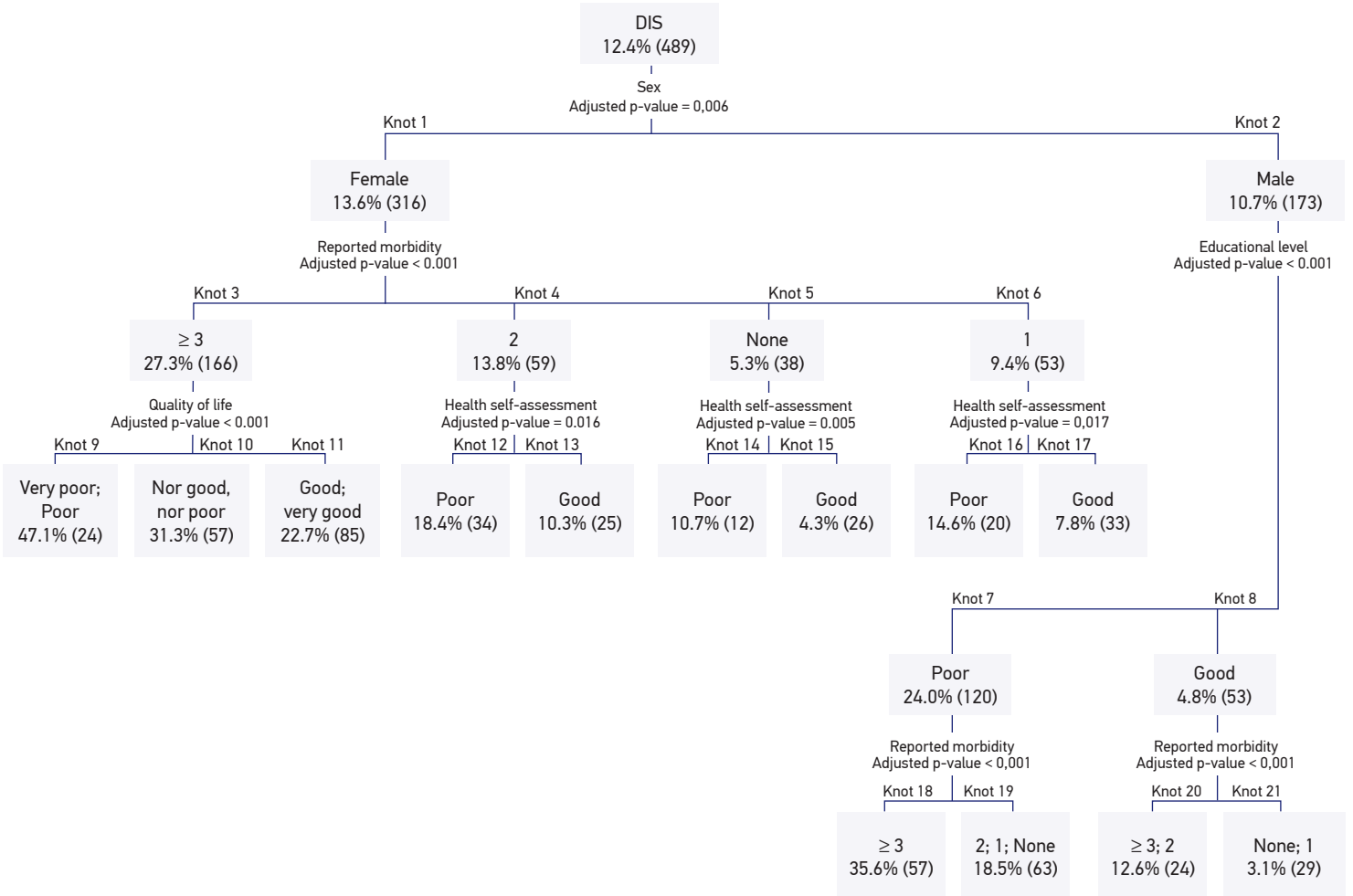
Variables	Female			Male			p-value[b]
	n* (%)**	%**	95%CI**	n* (%)**	%**	95%CI**	
Reported morbidity[£]*							
None	738 (36.3)	4.9	(3.1 – 6.7)	771 (50.7)	3.9	(2.3 – 5.5)	0.417
1	575 (23.3)	9.2	(6.5 – 11.9)	407 (23.9)	7.4	(4.6 – 10.2)	0.360
2	444 (17.4)	12.2	(7.6 – 16.8)	246 (13.3)	12.1	(5.9 – 18.4)	0.994
3 or more	632 (23.0)	25.5	(20.9 – 30.1)	235 (12.1)	27.6	(18.2 – 37.1)	0.678
p-value[a]		< 0.001			< 0.001		
Health self-assessment[§]							
Good	1.513 (67.0)	7.2	(5.5 – 8.8)	1.144 (73.6)	3.7	(1.9 – 5.5)	0.005
Poor	874 (33.0)	21.4	(17.7 – 25.2)	515 (26.4)	22.6	(18.1– 27.1)	0.697
p-value[a]		< 0.001			< 0.001		
Quality of life[§]							
Good/very good	112 (4.3)	10.1	(8.2 – 11.9)	58 (3.1)	7.0	(5.0 – 9.0)	0.021
Nor poor, nor good	518 (20.0)	15.3	(11.8 – 18.9)	325 (17.9)	14.5	(9.9 – 19.1)	0.779
Very poor/poor	1.756 (75.7)	27.8	(17.4 – 38.3)	1.275 (79.0)	19.5	(6.5 – 32.5)	0.324
p-value[a]		< 0.001			< 0.001		
Life satisfaction[§]							
Satisfied	1.827 (75.3)	10.8	(8.9 – 12.8)	1.302 (78.1)	8.3	(6.2 – 10.5)	0.065
Unsatisfied	560 (24.7)	15.2	(11.7 – 18.8)	355 (21.9)	10.0	(6.4 – 13.7)	0.053
p-value[a]			0.026			0.407	

[a]χ^2 test: comparison of disability prevalence according to the assessed characteristics for each stratum; [b]Wald test: comparison between sexes of disability prevalence for health characteristics; [§]< 10 missing; *number of subjects in the non-weighed sample; **weighed proportions and prevalence; [£]list comprised of 15 self-reported diseases: hypertension, high cholesterol, diabetes, asthma, arthritis (rheumatism, osteoporosis, arthrosis), chronic kidney disease, depression, migraine, epilepsy, tuberculosis, cancer (malign tumor), heart disease, lung chronic disease (bronchitis, emphysema), chronic digestive disease (ulcer/gastritis), and mental illness (schizophrenia, psychosis, anxiety disorder, bipolar disorder, compulsive obsessive disorder, panic syndrome, anorexia, bulimia); CI: confidence interval.



DEF: disability; mw: minimum wage.

Figure 1. Multivariate analysis of sociodemographic characteristics associated with disability (n = 3,937). *Estudo Saúde em Beagá*, 2008–2009.



DIS: disability.

Figure 2. Multivariate analysis of health characteristics associated with disability (n = 3,937). *Estudo Saúde em Beagá*, 2008–2009.

of Brazilian studies — some of which show higher prevalence of DIS than ours, such as the Brazilian census from 2000[21] (14.5%) and 2010[5] (24.0%) — may be attributed to the broad meaning of the term *disability* to the target population, to the investigated age ranges and to different tools applied[4,7,13,23]. The Sao Paulo Health Survey (ISA, acronym in Portuguese) found 11.1% people reported DIS[13], which is a very similar result to the prevalence found in our investigation, and both were conducted in the same period and used a similar tool.

Literature on the increasing prevalence gradient of DIS and impairment with ageing is consistent[4,13,24]. Most studies report higher frequency of DIS from 60 years of age or older, in both sexes[4,9,21]. In our study, the gradual increase of DIS from the age of 40 years in both sexes calls attention. Despite its non-significance in the comparison between men and women, it was higher among the latter. Hosseinpoor et al.[24] found higher prevalence of DIS among women aged above 80 years when compared with men. A possible explanation for the high prevalence of DIS among females is the longer longevity of this population group associated with non-fatal chronic conditions, besides constitutional factors such as decreasing muscle strength and alteration of the osteoarticular system[10,11]. Another characteristic related to high prevalence of DIS among women refers to ethical questions. Non-white women showed higher prevalence of DIS (13.1%) compared with men in the same demographic (8.1%), which agrees with data published in Brazilian studies[5].

Relevant aspects in the process of health social determinants seem to be interconnected with DIS. Correlations between DIS and SES indicators, such as income[3,12,25], educational level[3,12], and occupation[1,5], are observed in scientific findings.

In this study, income for both sexes and educational level for men were inversely associated with DIS. The highest percentage of DIS for women was among those aged 40 to 59 years and with family income lower than 5 minimum wages. Men with educational levels lower than four years of schooling presented higher proportions of DIS in the categories of lowest income. Such results are in agreement with Brazilian studies that report higher prevalence of DIS among men, heads of households, and those with lower educational level[6,13]. The presence of men with DIS excluded from the labor market with lower incomes can be considered a strong marker of social inequality[5,6]. Such findings reinforce that lower SES worsen the vulnerability condition of women and men at functional performance. This condition combined with ageing favors DIS worsening in both sexes[3]. However, in populations with better socioeconomic conditions, a disabled person has better opportunities, including access to education and work, which may reflect on the accumulation of assets and favor better conditions for preventive and curative measures, thus avoiding the worsening of DIS[6].

With regard to the occupational question, there is an agreement in many investigations about the association of manual labor with DIS self-reporting in both sexes. However, the World Report on Disability[1] highlights this condition in women, among whom manual labor reflects worse health conditions owing to stress and physical exposure they faced at the workplace.

Herein, after investigating occupations in strata of men with lower educational levels (< 4 years of study) and lower incomes (Knot 13 of the decision tree, in which 24.1% of the subjects with DIS were found), 77.0% of them reported not working at that moment compared with the 40.7% of the group with higher incomes (Knot 14), regardless of the age. This suggests that the labor market restriction may be associated with lower incomes. The association of low income with higher prevalence of DIS among women and men usually occurs owing to worse job opportunities and income[1]. Similarly to the model of men, women with low incomes and of working age (between 40 and 59 years of age) (Knot 11 of the decision tree, in which 18.5% of the subjects with DIS were found) correspond to approximately 52.0% of those that mentioned being unemployed compared with the 36.4% of the group with higher incomes (Knot 12).

High prevalence of comorbidity among people with DIS in both sexes has been well documented in literature[13,14]. A result of this study is that both men and women with three or more diseases presented higher proportions of DIS. Exactly as in other studies, the association of high frequency of self-reported diseases among women was attributed to worsened perception of QL and, among men, to worsened perception of health self-assessment[10,26]. The most common male and female self-reported diseases were hypertension, arthritis, depression, heart diseases, respiratory system diseases, asthma, diabetes, and mental illness. However, when the proportions of self-reported diseases were compared between sexes, significant differences were found for arthritis, heart diseases, and asthma, with higher proportion for females (data are not shown). Results are in agreement with literature[10,14,26]. It is worth noting the fragility of this indicator of self-reported diseases in the comparison between sexes, because whereas men usually die earlier than women; the latter live longer, but with frequent complaints about diseases[27].

The concept of DIS has been changing recently. Many studies use limitations in activities of daily living and mobility, such as walking or climbing steps, as well as self-reported DIS, to compose the DIS indicator. It is worth noting that the ICF theoretical model was used in this study as a conceptual framework to define the event and its relationship with personal factors in order to know the health conditions of people with DIS[1,2].

Before conclusions are drawn, some limitations should be considered since this is a cross-sectional study, and therefore no causality relations could be established. Thus, longitudinal analyses should be performed in future studies to explore the associations found herein. However, the dependent variable of the study (DIS presence) was measured using self-reporting and did not include information concerning subject's limitations in activities or even restrictions of participation in life situations – which are relevant aspects for functionality assessment. Furthermore, the degree of DIS was not measured during the interview, but only its presence or absence. Finally, the external comparison of the study results was more difficult owing to the diversity of definitions found for the term *disability*, as previously explained, as well as to the question used in the survey. Another aspect to be considered is the fact that this study is limited to approaching personal factors; however, it is worth noting that environmental factors and their relationship with functioning and disability are relevant, and therefore should be explored in future studies in order to holistically

represent the multidimensional model proposed by ICF. Despite the comparability difficulties found, similar prevalence to those of Brazilian and international studies suggests the external validity of this study.

Adding to further development in this area of research, this study contributed to mapping and comprehending DIS owing to its comparative observations between urban female and male residents. Furthermore, this study explored the interrelationships between sociodemographic and health factors in a population sample from an urban center which presented city inequalities. It also showed progress in relation to the published data, based on the Brazilian Census, by investigating the differences between sexes with the decision tree technique — an analysis instrument that easily identifies populations at risk in public health research[28].

CONCLUSION

This study progressed in the identification of the DIS attributes in each sex and clarifies in which aspects men and women with DIS are more vulnerable.

Among the attributes, work and education conditions stands out, since they focus on the reduction of health inequalities in an attempt to decrease the DIS impact associated with population ageing. For further study, we suggest new research with qualitative approaches to better clarify the DIS determinants among women and men, in addition to more robust methodological approaches.

ACKNOWLEDGEMENTS

We would like to thank the members of the Urban Health Observatory from Belo Horizonte who participated in the Health Project in Beagá; to the National Council for Scientific and Technological Development (CNPq) for providing the research productivity scholarship to Waleska Teixeira Caiaffa; and to the *Programa Mineiro de Capacitação Docente* (CDS10026/11), FAPEMIG, for providing the PhD scholarship to the student Mônica Faria Felicíssimo.

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Received on: 04/27/2015
Final version presented on: 04/06/2016
Accepted on: 05/16/2016