Association Between Asthma and Self-rated Health: An Analysis of the Brazilian Population

Marcos Laelton Marcondes, Alexandra Crispim Boing
Federal University of Santa Catarina, Brazil

Abstract: Objective: Describe the prevalence of asthma and to test the association of asthma with self-rated health. Methods: Population-based cross-sectional study. The data used in this study are from the 2008 National Household Survey with complete coverage of the national territory. In this study the reference population were adults (n = 216,547). Poisson regression was conducted, considering the design effect. Results: The prevalence of asthma was 3.8% among adults, higher among women, older adults, with poor socioeconomic status, with higher education, with more comorbidities, who were hospitalized in the past year, and negatively evaluate their health. In the adjusted analysis we observed that the prevalence of negative self-rated health was 1.41 higher among asthmatics. Conclusion: Asthma prevalence has shown great variation in relation to socioeconomic and demographic variables. Moreover, there was significant association between asthma and negative self-rated health.

1. Introduction

It is estimated that 300 million people worldwide suffer from asthma, with 250,000 annual deaths attributed to the disease or its complications. According to the World Health Organization (WHO), in India there are about 15 to 20 million asthmatics [1]. In the United States, about 34.1 million people (11.5% of the population) were diagnosed with asthma by a health professional during his or her life [2], and approximately 3% to 7% of adults and between 4% and 20% of children are affected by the disease [3]. In Brazil in the early 2000s, prevalence of asthma among adults ranged from 4.1% to 4.5%, depending on the age group considered [4,5].

Asthma is a very common disease that causes enormous social impact. Data from the Centers for Disease Control and Prevention (CDC) indicate that 10 to 11 million Americans had experienced acute episodes of asthma by the end of the 20th century, resulting in 13.9 million outpatient visits, 2 million emergency room visits, and 423,000 hospitalizations

at a total cost of over 6 billion dollars [6]. Asthma is the most common chronic respiratory disease in Canada, affecting about 2.2 million adults and 0.8 million children. Inadequate asthma control imposes a significant burden on the health system, with annual direct and indirect costs estimated to exceed $ 600 million in Canada [7].

In addition to the costs of the disease, asthma also has a great impact on patients' lives, increasing absenteeism at school and at work [8,9], sometimes leading to the abandonment of employment due to impossibility to perform the function, limiting physical activities, causing diverse psychological problems and worsening the quality of life [10,11].

The impact of asthma has traditionally been measured in terms of disease prevalence, mortality, and levels of utilization of health services, particularly hospital admissions. However, the impact of asthma extends beyond these outcomes, by exerting effects on lifestyle, well-being and self-assessment of health status [12]. There are few standardized studies and based on population surveys that assess the impact of asthma on self-reported health [13]. The aim of this is to explore the association between asthma and self-reported health in a national sample of Brazilian adults.

2. Methods

Data from a cross-sectional population-based study in Brazil were used. The survey was carried out with complete coverage of the national territory, totaling data of 391,868 interviewees and 150,591 domiciliary units visited. The reference population for the present study were adults aged 20 to 59 years who participated in the 2008 National Health Survey (n = 216,547).

The sample selection process was carried out in three stages. The first stage was formed by the municipalities (primary sampling units), the second stage was formed by the census tracts, which are

administrative units formed by a continuous area that covers about 300 to 350 households defined by the Brazilian Institute of Geography and Statistics (IBGE) and the third stage units were the households included in the selected census tracts.

The present study investigated the association between asthma and self-reported health. The exploratory variables used were: sex, age, educational level, per capita income, hospitalization in the last 12 months, and the presence of other chronic diseases (spine disease, arthritis or rheumatism, cancer, diabetes, hypertension, heart disease, chronic kidney disease, depression, tuberculosis, tendinitis or tenosynovitis and cirrhosis). For the identification of bronchitis or asthma the following question was asked: "Has any doctor or health professional ever told you that you have or had bronchitis or asthma?"

Self-reported health was obtained through the following question: "In general, you consider your state of health as: 1. Very Good; 2. Good; 3. Regular; 4. Bad and 5. Very Bad ". Those who responded Very Good, Good, or Fair to their health status were considered to have a positive self-reported health, while those who responded Bad or Very Bad were rated as having negative self-rated health.

In the statistical analysis, the svy command was used to correct the effect of complex sample delineation, available in Stata software version 12.0. The present study described the prevalence of the outcome and used Poisson regression.

3. Results

The sample consisted predominantly of women, 31.2% of the sample was between 20 and 29 years old and 33.2% had between 9 and 11 years of study (33.2%) (Table 1). Regarding health issues, 66.7% of the adult sample had no chronic disease, while 33.3% had at least one chronic disease. Only 7.3% of all patients had been hospitalized in the last 12 months and 75.5% considered their health in a positive way. (Table 1).

The prevalence of asthma was 3.8% among adults. The value was higher among women, older adults, people with lower income, higher educational level, with more comorbid, that had been hospitalized in the last year, and that reported negative health status.

In the crude Poisson regression analysis, it was verified that the Prevalence Ratio (PR) of negative self-rated health among asthmatics was 1.89 times higher in relation to non-asthmatics. By adjusting this analysis by sex, the negative self-rated PR varied to 1.86. When adjusting for sex and age, this value remains the same; however, when the above-mentioned variables are adjusted for income and schooling, the negative self-rated health ratio becomes 1.88 times higher. In model 5 the variables

that adjusted the model were: gender, age, schooling, per capita income and chronic disease, resulting in a 1.43 times higher prevalence of negative self-rated health among asthmatics when compared to non-asthmatics. Including in the final model the hospitalization, the prevalence becomes 1.41 times greater in one group in relation to the other.

Table 1 – Sample distribution. Brazil, 2008.

Variáveis	n	% (CI$_{95}$%)
Sex [n=216.547]		
Men	104.124	48,2 (48,0 – 48,4)
Women	112.423	51,8 (51,6 – 52,0)
Age (years) [n=216.547]		
20-29	68.846	31,2 (30,9 – 31,5)
30-39	58.415	26,8 (26,5 – 27,0)
40-49	51.825	24,2 (23,9 – 24,4)
50-59	37.461	17,8 (17,6 – 18,1)
Per capita income [n=209.123]		
Tercile 1	81.268	40,8 (39,7 – 41,9)
Tercile 2	69.634	32,9 (32,4 – 33,4)
Tercile 3	58.221	26,3 (25,2 – 27,4)
Educational level (years of study) [n=215.531]		
12 or more	33.786	15,8 (15,3 – 16,3)
11-9	72.664	33,2 (32,7 – 33,8)
8-5	51.475	23,6 (23,2 – 23,9)
4 or less	57.606	27,4 (26,5 – 28,2)
Chronic disease [n=216.547]		
None	145.579	66,7 (66,3 – 67,1)
1	44.326	20,6 (20,4 – 20,9)
2 or more	26.642	12,7 (12,4 – 12,9)
Hospitalization in the last 12 months [n=216.547]		
No	200.908	92,7 (92,5 – 92,9)
Yes	15.639	7,3 (7,1 – 7,5)
Self-rated health [n=216.547]		
Positive	162.376	75,5 (75,0 – 75,9)
Negative	54.171	24,5 (24,0 – 25,0)

4. Discussion

In our study we found a prevalence of asthma of 3.8% among adults aged 20 to 59 years. According to international studies, the prevalence of asthma among adults ranges from 2.7% to 4.0% in most European countries [14]. These values are very similar to ours. Aggarwal et al. [15] found a slightly lower prevalence in India, ranging from 1.69% to 3.47%. Other studies, however, have shown higher prevalence in the USA and in England [16].

In relation to the Brazilian studies, Mambrini [17] reported asthma prevalence of 4.1% in the adult population in 2003. Theme-Filha [18], however, found a significantly higher value than that of our study (12%). These significant differences in results may be explained by the different methods used in the surveys, as well as by the lack of uniformity in the diagnosis of the disease, which is multifactorial in nature.

Regarding sex, age, income and comorbidities, our study agrees with most of the literature, which identifies the highest prevalence of asthma among women, older adults, those with lower incomes and

those with the highest number of chronic diseases [5,18,13,19]. The higher prevalence of asthma among lower income individuals may be related to greater and more intense exposure to substances and environments that causes the disease, as well as having less access to health services [20].

The prevalence of positive self-rated health was 75.5%. This value was very similar to the national result of 2003, which showed that 78.6% of Brazilians positively assessed their health status. Peres et al. [21] analyzing data from a city located in southern Brazil also found value very close to ours, revealing in their study that 74.2% of the adults reported positive health.

Regarding our specific objective, we identified that the prevalence of negative self-rated health was 89% higher in the group reporting asthma. After multivariate analysis, adjusting for gender, age, schooling, per capita income, chronic illness and hospitalization, we found a PR value of 1.41. A large study carried out in 2003 analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS) and found results that can be compared to our findings. In this work, Ford et al. [22] observed that participants with 'current asthma' reported significantly more days of physical and mental health, as well as more days of limiting physical activity, compared to those who had never had asthma. After adjusting for age, sex, race or ethnicity, schooling, employment status, smoking, physical activity level and body mass index, the odds ratio of negative self-rated health among people with asthma, compared with people who had never had asthma, was 2.41.

A study conducted in Australia analyzed data from the National Health Interview Survey (NHIS). 14,641 adults aged 18-64 years were interviewed and the authors found that asthma was present in 3.18% of people who reported little satisfaction with their lives. The figure increased to 8,12% among people who reported negative health, 5.90% among people who reported high psychological distress and 3.58% among people who reported some restriction of their daily activities. The proportions of people with these adverse health conditions attributable to asthma were greater than the proportions attributable to diabetes, but lower than the proportion attributable to arthritis [23].

The main limitations of our study are those related to the characteristics of cross-sectional studies. Because it is a prevalence study, it is not possible to determine the causal link between the variables. As a consequence, it is impossible to attribute to asthma, with absolute certainty, the negative outcome of the self-rated health, even after adjusting for all the variables. In addition, self-referenced information is subject to information bias.

It is possible to infer that asthma is associated with negative self-rated health and consequently on the populational quality of life. In addition, it is possible to affirm that there are enormous inequalities in the prevalence of asthma in relation to several socioeconomic and demographic variables, such as age, gender, per capita income and schooling.

These findings contribute to understanding how asthma is distributed in the population and its association to the quality of life, thus giving greater support in the decision-making process regarding the development of public health policies specifically aimed at combating this disease and its consequences.

5. References

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