

Psychotropic drug use among older adults: prevalence and associated factors

Uso de psicofármacos entre idosos residentes em comunidade: prevalência e fatores associados

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ABSTRACT: *Objective:* Investigating the prevalence of psychotropic drug use among older adults and factors associated with it. *Methods:* This study was based on the Belo Horizonte Metropolitan Area Health Survey, conducted in 2003. It involved 1,635 elderly (60 years or older) citizens, who were residents of cities within the Belo Horizonte Metropolitan Area and were selected using complex randomize sampling. Logistic regression models were used to identify factors associated with psychotropic drug use, with a 5.0% significance level. *Results:* The prevalence of psychotropic drug use in the sample was 13.4%; specifically, 8.3% of individuals surveyed used benzodiazepines, whereas 5.0% used antidepressants. The following factors were independently associated with the use of psychotropic drugs: female gender (OR = 2.20; 95%CI 1.49 – 3.27), medical diagnosis of depression (OR = 6.42; 95%CI 4.31 – 9.55), 5 or more medical appointments in the last 12 months (OR = 2.15; 95%CI 1.32 – 3.53), and subscription to private health insurance (OR = 2.69; 95%CI 1.86 – 3.88). *Conclusion:* The prevalence observed was similar to the one verified in other elderly Brazilian populations and the pattern of associated factors was consistent with the one detected for older populations of higher-income countries. Medical diagnosis of depression was the factor most strongly associated with psychotropic drug use.

Keywords: Psychotropic drugs. Elderly. Drug use. Pharmacoepidemiology. Health surveys. Health of the Elderly.

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RESUMO: *Objetivo:* Investigar a prevalência e os fatores associados ao uso de psicofármacos entre idosos. *Métodos:* O estudo, realizado em 2003, baseou-se no Inquérito de Saúde da Região Metropolitana de Belo Horizonte (RMBH). Participaram do estudo 1.635 idosos (60 anos ou mais) residentes nos municípios da RMBH, selecionados por meio de amostra probabilística complexa. Modelos de regressão logística foram utilizados para identificar os fatores associados ao uso de psicofármacos, considerando o nível de significância de 5,0%. *Resultados:* A prevalência de uso de psicofármacos foi de 13,4%, sendo 8,3% para uso de benzodiazepínicos e 5,0% para antidepressivos. Os fatores independentemente associados ao uso de psicofármacos foram sexo feminino (OR = 2,20; IC95% 1,49 – 3,27), relato de diagnóstico médico para depressão (OR = 6,42; IC95% 4,31 – 9,55), ter realizado 5 ou mais consultas médicas nos últimos 12 meses (OR = 2,15; IC95% 1,32 – 3,53) e afiliação a plano de privado saúde (OR = 2,69; IC95% 1,86 – 3,88). *Conclusão:* A prevalência observada foi semelhante ao verificado entre idosos brasileiros e o padrão de associações detectado foi consistente com o observado em populações idosas de países de maior renda, sendo o relato de diagnóstico médico para depressão o fator mais fortemente associado ao uso de psicofármacos.

Palavras-chave: Psicotrópicos. Idoso. Uso de medicamentos. Farmacoepidemiologia. Inquéritos epidemiológicos. Saúde do Idoso.

INTRODUCTION

Psychotropic drugs act directly on the central nervous system, and constitute an important therapeutic resource for the treatment of behavioral and mood disorders¹. The increase in psychotropic drug prescriptions and the controversies surrounding their efficacy and tolerability have drawn the attention of health care researchers^{2,3}.

The elderly individuals, in special, are the most frequent users of psychotropic drugs, due to this population's prevalence of psychiatric comorbidities and the use of these drugs in relieving somatic conditions^{4,5}. Among elderly Europeans, psychotropic drug use ranged between 20.5 and 29.8%⁶⁻⁸, numbers higher than those observed among elderly North Americans (14.9 and 19.0%)^{3,9}. In the elderly population, the female sex, a negative self-assessment of one's health and the presence of depressive symptom are the characteristics most frequently associated with the use of psychotropic drugs.^{6,9,10}

Brazilian population-based studies on the use of psychotropic drugs in general (antipsychotics, antidepressants, anxiolytics, and sedatives/hypnotics) are infrequent, and almost all of included a general population sample¹¹⁻¹⁵. In Brazil, psychotropic usage ranged between 5.2 and 10.2% among the general population, being greater among older people. These studies have identified medical appointment as a determining factor of psychotropic drug use, and have detected evidence of restrictions on access to these drugs based on the low usage observed among those diagnosed with psychiatric disorders.

To our knowledge, only one Brazilian study has investigated the usage of psychotropic drug among the elderly in specific, with a sample of 1,165 São Paulo city residents. Such study observed a 12.2% prevalence of usage among the elderly, with a slight

predominance of antidepressants (AD) over benzodiazepines (BZD) as the most used chemical subgroup. Positive independent associations were detected for the female sex and polypharmacy¹⁶.

Studies on the use of medicines are an important field of pharmacoepidemiology research and are useful for promoting the rational use of medicines. They enable us to know the consumption pattern of drugs in populations and to assess whether it is in harmony with their health needs, as well as to identify risk situations associated with its use and to substantiate actions and reflections related to the drug prescription, dispensing, and use. Studies on drug use by the elderly individuals have gained track due to this population's particular vulnerability to its adverse effects. Among the elderly people, psychotropic drugs have been associated with adverse events such as falls with a risk of fractures, cognitive impairment and delirium, as well as psychiatric hospitalizations¹.

The present study was developed with the goal of estimating the prevalence of and identifying the factors associated with the use of psychotropic drugs among older adults.

METHODOLOGY

STUDY POPULATION AND AREA

This population-based cross-sectional study was conducted in the Belo Horizonte Metropolitan Area (BHMA) at the state of Minas Gerais. The BHMA (comprising 24 cities) is the third most populous metropolitan area of Brazil, with the third largest economic production, and demographic trends similar to those at rest of the country, with a growing and rapidly aging population¹⁷.

This study is part of the Belo Horizonte Health Survey conducted between May and June 2003 as part of the BHMA Survey on Employment and Unemployment organized by Fundação João Pinheiro, a Minas Gerais government agency. The BHMA Survey on Employment and Unemployment has been conducted monthly since 1995 and is aimed at investigating the structure and dynamics of the regional labor market¹⁷. The Belo Horizonte Health Survey primarily concerned with diagnosing the health conditions of adults living at its metropolitan area, with an emphasis on the elderly. Health diagnosis includes the following aspects: health conditions, health-related life styles, effective access to health services and inputs (including drugs), in addition to physical functionality¹⁷.

The population studied was selected through two-stage cluster sampling, in which the IBGE (the Brazilian Institute for Statistics and Geography, the national census authority) census blocks were used as primary selection units and households as sampling units. The sample was representative of the population living in the cities of the BHMA. All residents living in households picked at the age of 20 or more years were selected for the participation in the Health Survey in a total of 13,701 participants, 1,777 of which were elderly (60 years of age or older) and were considered eligible for the study.

STUDY VARIABLES AND DATA COLLECTION

The use of psychotropic drugs in the 15 days prior to the interview was defined as the dependent variable of the study. The participants were asked if they had used any medicine during this period; those who responded positively were asked about the name of medicine and the manufacturer, which was confirmed by checking its packaging. This information was used to identify the medicine used and to analyze its active principles. Herbal medicines were not taken into account. Based on their active ingredients, drugs were categorized according to the Anatomical Therapeutic Chemical Index (ATC) developed by the World Health Organization Collaboration Center for Drugs Statistic Methodology (WHO/ATC, available at <http://www.ahocc.in/atcddd/indexbase/> - accessed August 2013).

Psychiatric drugs were considered those categorized under the following ATC codes:

1. N05 (psycholeptics) – including antipsychotics (N05A), anxiolytics (N05B), and sedatives/hypnotics (N05C);
2. N06 (psychoanaleptics) – including antidepressants (N06A), combinations of psycholeptics and psychoanaleptics (N06C), in addition to anti-dementia drugs (N06D);
3. Clonazepam – classified by the ATC as an antiepileptic (N03A), was also considered a psychotropic drug for the purposes of this study due to its routine prescription as an anxiolytic for the treatment of anxiety-related sleep disorders.

Explanatory variables included sociodemographic characteristics, health-related habits and behaviors, health conditions, and access to health care services.

Sociodemographic variables were the following: sex, age group (60 – 69; 70 – 79; 80 years or more), marital status (married/stable; a widower; single/separated), years of schooling (0 – 3; 4 – 7; 8 years or more) and habitation status (that is, whether the subject lived alone or not).

Information pertaining smoking habits (never smoked; former-smokers, current smokers), binge drinking (occurrence of an episode of abusive alcohol use in the last 30 days, dichotomized) and regular practice of physical exercise (three or more times per week, dichotomized) was used for comparing life habits and health behaviors. Abuse of alcohol (binge drinking) was defined as the consumption of five or more doses (for men) and four or more doses (for women) in a single occasion in the last 30 days¹⁸.

The set of health condition descriptors comprised the self-assessment of one's health (as very good/good; reasonable; poor/very poor), the presence of selected chronic health conditions (hypertension, diabetes, arthritis/rheumatism, coronary disease, cancer, stroke), depression, and sleep disorders. The report of medical diagnosis was used to determine the presence of depression as well as every other health condition listed. The detection of sleep disorder was based on one's self-reporting of at least one episode in the past 30 days. Depression and sleep disorders were considered separately as they constitute indicators of psychotropic drug use. Descriptive variables on the use of health services were the number of medical appointments (0 – 1; 2 – 4; 5 or more visits), a history of hospitalization in the last 12 months, and coverage by private health insurance services.

DATA ANALYSIS

The prevalence of psychotropic drug use was calculated as the ratio between the number of participants who reported the use of these drugs and the total number of participants in the study. To identify the most frequently used medicines, we calculated the ratios between reports of a given drug and the total number of drugs used. The comparison between users and non-users of psychotropic drugs in relation to the variables of the study relied on Pearson's χ^2 tests, using Rao & Scott's correction factor. Logistic regressions (both univariate and multivariate) were used to investigate the factors associated with the use of psychotropic drugs. The appropriateness of the models was based on the Hosmer–Lemeshow test. The multivariate model included all variables which, in the univariate analysis, showed association with the event at a significance level of less than 10%. Variables that showed a *p*-value of < 0.05 were considered to be independently associated to the event in question. The Stata statistical software package, version 13.0, was used in the analysis. Specifically, we made use of it to analyze data collected from complex samples (through the « svy » command), as it takes into account the sample design and sample weights of individual participants. The Belo Horizonte Health Survey was approved by the Ethics Committee of *Fundação Oswaldo Cruz* (opinion 011/2001). The authors declare no conflict of interest.

RESULTS

Of the total number of elders eligible for the study ($n = 1,777$), 1,635 (92.0%) of them participated in it; 142 participants were not included in the analysis due to a lack of information on drug use. Participants excluded were similar to the population studied as to the characteristics included in the research (data not shown).

Tables 1 and 2 describe the characteristics of the population studied and the results of the univariate analyses for association between said characteristics and psychotropic drug use in general. Most of the participants were females (59.0%) aged between 60 and 69 years (56.3%) and married or living in domestic partnerships (53.0%). The average educational level was low (41.4% had completed less than 4 years of study) and only 12.6% of the sample lived alone. As to life habits, 12.8% of participants were smokers, 15.4% reported binge drinking, and 19.7% practiced physical exercises on a regular basis (3 or more times per week) (Table 1).

As to the population's health conditions and usage of health services: 12.7% have defined their health as poor or very poor; 14.7% reported medical diagnoses of depression; 15.2% reported sleep disorder episodes in the 30 days prior to the interview; and 69.4% had received medical diagnoses for at least one of the chronic diseases investigated. Around 71.3% had consulted doctors two or more times and 14.6% had been hospitalized at least once in the last 12 months. A little less than half of the population (45.5%) was covered by private health insurance services (Table 2).

Table 1. Distribution of elderly according to sociodemographic characteristics and lifestyle habits, in the total population and due to the psychotropic drug use at the Belo Horizonte Metropolitan Area, 2003.

Characteristics	Total population	Psychotropic drug use		p-value
		Yes	No	
	(n = 1635) (%)	(n = 219) (%)	(n = 1416) (%)	
Sex				
Male	40.9	22.0	43.8	< 0.001
Female	59.1	78.0	56.2	
Age (in years)				
60 – 69	56.3	49.8	57.3	0.142
70 – 79	31.0	36.8	30.2	
80 or more	12.7	13.4	12.6	
Education (in years)				
0 – 3	41.4	33.8	42.6	0.051
4 – 7	31.6	38.2	30.6	
8 or more	27.0	28.0	26.8	
Marital status				
Married/domestic partnership	53.0	42.6	54.6	0.004
Widow	32.8	42.7	31.3	
Single	14.2	14.6	14.1	
Housing arrangement (live alone)				
No	87.4	84.5	87.8	0.218
Yes	12.6	15.5	12.2	
Use of tobacco				
Never	61.8	63.0	61.6	0.937
Ex-smoker	25.4	25.0	25.5	
Smoker	12.8	12.1	13.0	
Alcohol abuse (<i>binge drinking</i>)				
No	84.6	94.4	83.0	< 0.001
Yes	15.4	5.6	17.0	
Regular practice of physical exercises				
No	80.3	84.4	79.7	0.139
Yes	19.7	15.6	20.3	

% weighted by sampling weight.

The estimated prevalence for the use of psychotropic drugs was equal to 13.4% (95% CI 11.6 – 15.2). Considering chemical subgroups, 8.3% (95% CI 6.9 – 9.8) used BZD; 5.0% (95% CI 3.8 – 6.1) took AD, whereas 1.7% (95% CI 1.1 – 2.4) and 1.5% (95% CI 0.9 – 2.1), respectively, reported the use of anti-dementia drugs and antipsychotics. Bromazepam (33.3%)

Table 2. Distribution of elderly according to health conditions use of health services in the total population and due to psychotropic drug use in the Belo Horizonte Metropolitan Area, 2003.

Characteristics	Total population	Psychotropic drug use		p-value
		Yes	No	
	(%)	(%)	(%)	
Self-assessment of health				
Very good/good	48.8	31.7	51.4	< 0.001
Reasonable	38.5	45.4	37.4	
Poor/very poor	12.7	22.9	11.2	
Depression				
No	85.3	54.6	90.1	< 0.001
Yes	14.7	45.4	9.9	
Sleep disorder				
No	84.8	75.5	86.2	< 0.001
Yes	15.2	24.5	13.8	
Number of NCDs				
None	30.6	15.8	32.9	< 0.001
1	33.5	29.5	34.1	
2 or more	35.9	54.7	33.0	
Number of medical appointments in the last 12 months				
0 – 1	28.7	12.9	31.1	< 0.001
2 – 4	37.3	31.3	38.3	
5 or more	34.0	55.8	30.6	
Health insurance coverage				
No	54.5	39.6	56.9	< 0.001
Yes	45.5	60.4	43.1	
Hospitalization in the last year				
No	85.4	77.7	86.6	0.001
Yes	14.6	22.3	13.4	

% weighted by sampling weight.

and diazepam (27.7%) accounted for more than half of BZD used, and amitriptyline made up 38.5% of AD consumed.

Sociodemographic characteristics and life habits significantly associated ($p < 0.05$) to use psychotropic drug use during univariate analysis included sex, marital status, and binge drinking; on the other hand, education level presented borderline statistical significance ($p = 0.051$). All descriptors for health conditions and usage of health services were associated ($p < 0.05$) to psychotropic drug use (Tables 1 and 2).

Table 3 shows the final results of multivariate analysis of sociodemographic characteristics, lifestyle habits, health condition indicators and descriptors of health services usage as associated with psychotropic drug use. Depression was the variable most strongly associated (OR = 6.13; 95% CI 4.09 – 9.18) to the psychotropic use, notably being the only health condition that remained independently associated after covariate adjustment. As to sociodemographic characteristics, the odds of females using these drugs was approximately twice as that for males (OR = 1.97; 95% CI 1.22 – 3.17). Among the descriptors for health services usage, the number of medical appointments attended over the last 12 months (restricted to 5 or more visits, OR = 2.14; 95% CI 1.29 – 3.57) and health plan coverage (OR = 2.53; 95% CI 1.65 – 3.89) both remained independently and positively associated with psychotropic drug use.

Table 3. Results of the multivariate analysis of factors associated with psychotropic drug use in the Belo Horizonte Metropolitan Area, 2003.

Characteristics	Odds ratio	95%CI
Sex		
Male	1.00	
Female	1.97	1.22 – 3.17
Depression		
No	1.00	
Yes	6.13	4.09 – 9.18
Number of medical appointments in the last 12 months		
0 - 1	1.00	
2 - 4	1.11	0.66 – 1.87
5 or more	2.14	1.29 – 3.57
Health insurance coverage		
No	1.00	
Yes	2.53	1.65 – 3.89

Odds ratios (95% CI): Obtained through logistic regression, adjusted for all variables included in the table, in addition to education, marital status, binge drinking, self-assessment of health, reporting of sleep disorders, number of chronic illnesses, and hospitalization in the last 12 months.

DISCUSSION

To our knowledge, this research is one of the only two Brazilian population-based studies¹⁶ to investigate the prevalence of psychotropic drug use and associated factors among the elderly in specific. The results identified the history of medical diagnosis for depression as the factor most strongly associated with psychotropic drug use. Other characteristics associated to drug use were being of the female sex; a higher number of medical appointments in the last 12 months; and health plan coverage. BZD (as a pharmacological group) and bromazepam (as an active ingredient) were ranked as the most used psychotropic drugs.

In our study, the prevalence of psychotropic drug use was found to be 13.8%, a value lower than the one found among elderly people living in higher income countries^{3,6-9}, and slightly higher than the one observed among Brazilian elderly in previous research¹⁶. Such differences between studies may have arisen due to issues related to the morbidity profile of studied populations and prescription patterns, which change according to context and time of conduction of studies. These differences may also derive from methodological details of the studies, such as the recall period chosen: longer recall periods may generate overestimates of prevalence due to the inclusion of participants who no longer use the drug. Thus, when comparing prevalence values observed, we focused on studies as similar as possible to ours, in terms of when they were conducted and/or methodological aspects related to the population studied and definition of psychotropic drugs.

BZD are the drugs most used by older adults residing in Belo Horizonte Metropolitan Area, unlike what was observed among those residing in another Brazilian metropolitan area, for whom AD¹⁶ were the most common type of drug. However, this finding was consistent with some of the latest international studies^{19,20}. BZD are drugs that have an increased risk of dependence and whose chronic use had already been detected in Brazilian studies²¹, ensuing concern.

As was mentioned above, the report of medical diagnosis for depression was the only health condition independently associated to the psychotropic drug use; its association with sleep disorders was no longer significant after covariate adjustment. This result is not surprising, and is often mentioned in the literature in different scenarios^{6,7,9,10,16}. Depression and sleep disorders are highly correlated¹⁰. A significant proportion of depressive patients report a decrease in the amount and quality of sleep²². As already mentioned, BZD and AD are the drugs most used by this population. The first are usually used for treating sleep and anxiety disorders, while for depressive disorders, AD and BZD are usually administered, the latter of which are not prescribed separately²³. The combined use of these drugs in treating depression may partially explain the different results for depression and sleep disorders. In this population, depression was associated with both the use of AD and BZD (results not shown).

In several studies, females appear recurrently associated with this event^{6,8-10,16}. Females' higher tendency to keep watch over one's own state of health, to recognize and more clearly and easily report physical and psychological symptoms, in addition to their socially attributed

greater frailty are often presented as explanations for this association^{6,9,16}. Other possible explanations would be the women's greater propensity to abuse these drugs²⁴ and the doctors' greater predisposition in prescribing these drugs to females^{1,9,16}.

A higher number of medical appointments (five or more) and coverage under private health insurances, used as descriptors of health services usage, were factors independently associated to psychotropic drug use in this population, confirming the literature^{6,9}. Both medical appointments as well as health insurance are factors that facilitate, directly or indirectly, access to medicines, including drugs. The explanation for the association of drug use with medical appointments is intuitive, and stems from the fact that Brazilian sanitary legislation requires in order to gain access to psychotropic drugs, that medical prescriptions be presented, which may be obtained in medical appointments²⁵. Still according to the law, psychotropic drugs are considered substances subject to special control and, therefore, prescribed quantities may not exceed a period of use of more than 60 days, which could increase the frequency of medical visits, especially among chronic users. Another possible explanation is related to the increased prevalence of BZD use among elderly diagnosed with depression, compared to the use of AD. The isolated use of BZD in treating depression appears to be inadequate and, in this case, a lack of improvement would lead to new appointments.

The impact of health insurance coverage on access to and use of drugs has been the object of attention by some researchers, either due to the reimbursing of pharmaceutical expenses, or to savings in medical appointments. This has been observed in international studies: a lower underutilization of drugs was detected among North Americans diagnosed with diabetes who were covered by health insurances which included pharmaceutical expenses²⁶. Among elderly North Americans not covered by insurance, underutilization of drugs due to high cost was positively associated with lower income, greater fragility, and higher expenditure on drugs²⁷. In the BHMA, the underutilization of medications due to financial reasons was significantly lower among older adults covered by private health insurances²⁸. In Brazil, some health insurances cover (partially or totally) the expenses involved in purchasing medicines, which could explain this association. However, this specific information was not available for the elderly investigated. If we consider health insurance coverage as a marker for higher socioeconomic level, this association may indicate covered elderly individual's greater ability to pay for medicines, while those not covered by insurance would depend more on public pharmaceutical assistance. Data from the 2008 PNAD (IBGE's national household survey) indicate that the total acquisition of drugs prescribed at SUS (the Brazilian public health system) was significantly higher among lower-income families²⁹. These results indicate the potential of the public health system for developing equity in access to pharmaceutical assistance, and highlight the relevance of public policies with this purpose, such as the "*Farmácia Popular*" program.

A possible limitation of this study is in detecting depression based on self-reports of medical diagnoses, which may have affected the accuracy of its estimated occurrence in the population studied. However, due to logistical difficulties, the self-report of medical diagnoses

and validated depressive disorders screening scales such as the GDS-30 or the GHQ-12³⁰ are traditionally used in epidemiological studies. In Brazil, the self-report of depression diagnosis has been used in health surveys at national³¹ and local²⁹ levels. Another limitation is the absence of data on the clinical specialty of who prescribed the drug. This may hinder the assessment of its suitability when coupled with the absence of data pertaining to the drug (dosage and duration of use).

With regard to limitations, it is also important to mention the cross-sectional design of the study and the fact that the analyzed data were collected in 2003. As to the former, the establishment of a causal relation between the associations detected is made impossible. In the latter's case, it is possible that the pattern of current consumption is distinct from that of 2003. However, it is worth noting the similarity between our results and those of recent international studies^{19,20}, as well as the fact two of the most used medication (amitriptyline and diazepam) are included in the list of drugs encompassed in basic pharmaceutical care, directed to conditions seen as priorities in basic health care³².

On the other hand, the strength of the present study lies primarily in the careful methodology involved in the sampling process and data collection. Sample representativeness (guaranteed by the sample design) and the high response rate achieved (92%) allow the inference of results for target population. Furthermore, it is important to stress the size of the population studied, which lends robustness to the results obtained.

Regarding the collection of data on psychotropic drugs, the conduction of the interview at the respondents' households, along with the checking of drug packaging, ensures greater precision as to the effective use of the medicinal product, which is an advantage in relation to pharmacoepidemiological studies based on prescriptions or sales records. Moreover, the time window considered (15 days) minimizes the occurrence of memory problems. All the necessary methodological care inherent to this type of study was taken in order to produce quality data, including adequate training of surveyors and use of a standardized data collection instrument.

CONCLUSION

Factors associated with the use of psychotropic drugs in the population studied are in line with those observed in other elderly populations in Brazil and in countries with higher income. The positive association with the female sex points to the need for health professionals to thoroughly investigate the presence of psychic symptoms among their male patients, given their lower propensity to report these symptoms during appointments. This would minimize the risk of elderly patients suffering from psychiatric disorders not gaining access to appropriate pharmacological care. The positive association of drug use with health insurance coverage reinforces the importance of pharmaceutical care in the public health system in access to medicine, especially among lower-income populations. Due to the scarce scientific production on the subject (i.e. psychotropic drug use among older adults) in Brazil, we hope that this work will stimulate new (and necessary) investigations on the matter.

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