ORIGINAL ARTICLE

Lack of access to medications for hypertension and diabetes *mellitus* among aged from 2017 to 2019 in Brazil

Falta de acesso a medicamentos para hipertensão e diabetes mellitus entre idosos de 2017 a 2019 no Brasil

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Abstract

Objective: to identify sociodemographic and regional differences in the lack of access of aged Brazilians to medicines for hypertension and/or diabetes *mellitus* in the last 30 days, in the years 2017, 2018 and 2019, based on data from the Telephone-based Surveillance of Risk and Protective Factors for Chronic Diseases (VIGITEL).

Methods: a population-based transversal study using data from VIGITEL. Were eligible the elderly (≥60 years) who answered affirmatively to the questions "In the past 30 days, did you have been without any hypertension medications for some time?", "In the past 30 days did you have been without any high to control diabetes for some time?", and "In the past 30 days, did you ran out of insulin?" Chi-squared test was used to describe the prevalence of the outcome in accordance with the independent variables, and ajusted Poisson Regression was used to estimate the prevalence ratio and respective 95% confidence intervals (95% CI).

Results: the prevalence of the outcome was 11.8% in 2017, 11.4% in 2018, and 11.2% in 2019. A higher prevalence of lack of access to medications for hypertension and diabetes mellitus was observed among elderly people of black/brown/yellow/indigenous skin color, less educated, beneficiaries of Bolsa Família, without private health plan and living in the Northeast and North regions.

Conclusion: there was a small reduction in the lack of access to medication for hypertension and diabetes between 2017 and 2019. Furthermore, the results reveal inequality in access to these medicines.

Keywords: drug utilization, chronic disease, health services accessibility, health surveys.

Resumo

Objetivos: identificar diferenças sociodemográficas e regionais na falta de acesso de idosos brasileiros a medicamentos para hipertensão e/ou diabetes mellitus nos últimos 30 dias, nos anos de 2017, 2018 e 2019, com base nos dados da Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico (VIGITEL).

Métodos: estudo transversal de base populacional com dados do VIGITEL. Foram elegíveis os idosos (≥60 anos) que responderam afirmativamente às questões "'Nos últimos 30 dias, o(a) Sr.(a). ficou sem algum dos medicamentos para controlar a pressão alta por algum tempo?', 'Nos últimos 30 dias, o(a) Sr.(a). ficou sem algum dos medicamentos para controlar a diabetes por algum tempo?' e 'Nos últimos 30 dias, o(a) Sr.(a). ficou sem insulina?'". O teste qui-quadrado foi utilizado para descrever a prevalência do desfecho de acordo com as variáveis independentes e a Regressão de Poisson ajustada foi utilizada para estimar a razão de prevalência e respectivos intervalos de confiança de 95% (IC 95%).

Resultados: a prevalência do desfecho foi de 11,8% em 2017, 11,4% em 2018 e 11,2% em 2019. A prevalência de falta de acesso a medicamentos para hiper-

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tensão e diabetes mellitus foi maior entre os idosos de cor da pele preta/parda/amarela/indígena, com menor escolaridade, beneficiários do Bolsa Família, sem plano privado de saúde e residentes nas regiões Nordeste e Norte.

Conclusão: houve uma pequena redução na falta de acesso a medicamentos para hipertensão e diabetes entre 2017 e 2019. Além disso, os resultados revelam desigualdade no acesso a esses medicamentos.

Palavras-chave: utilização de medicamentos; doença crônica; acesso à atenção primária; inquéritos de saúde.

Abbreviations: SAH, Systemic arterial hypertension; SUS, Unified Health System; VIGITEL, Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases;

Introduction

Hypertension (SAH) and diabetes mellitus (DM), affect 27.5% and 71.5% of the Brazilian population aged, respectively (1 – 4). In addition, Chronic non--communicable diseases (NCDs), including SAH and DM. are considered the most responsible for hospital admissions, totaling almost two million in 2018, which is equivalent to 16% of total hospital admissions by the Unified Health System (SUS), and resulting in a total cost of R$ 3.84 billion (5).

Pharmacotherapy is one of the approaches for the treatment of hypertensive and diabetic patients, and adherence to drug treatment is a determining factor for controlling the evolution of these diseases, reducing the chance of future comorbidities, and improving the quality of life of individuals (6. 7). International studies indicate that the gaps from detection to treatment and control of the disease are variable and this is due to the different levels of resources available in each country (8). Thus, it becomes relevant to think that adherence to pharmacological treatment is related to the personal and behavioral characteristics of individuals and to the access to medicines (9). So, the access is an indicator of the quality of care offered to hypertensive and diabetic users, since the lack of access to medications reveals a failure in the health system that will directly impact the worsening of the disease and the increase in the search for health services, both in primary, secondary, and tertiary care (10).

In Brazil, there are strategic programs to expand access to free medicines in the public network, which includes primary care and the pharmacies of the Popular Pharmacy Program (11.12). These public policies expand access to medicines and act in the control and monitoring of NCDs. as proposed by the Plan of Strategic Actions to Combat NCDs in the country (13). However, there is a reduction in the public budget for financing of medicines in the health services of the Unified Health System. In 2010. SUS had a total expenditure of R $ 14.3 billion; in five years, spending has increased to 20 billion. However, in the face of the economic crisis, there was a reduction of 7% in relation to the 2016 budget (14).

Considering that more than half of the population using the public health service are from low-income groups, dependent on the good execution of drug distribution policies, and that the reduction in the financing of these policies can increase inequity in access to medicines for NCDs and the discontinuity of care for these individuals can cause an increase in the demand for care in SUS, still, and starting from the hypothesis that due to the reduction of the public budget for financing and availability of medicines in the Unified Health System, there would be an increase in the lack of access to medicines for SAH and diabetes over the years, the aim of this study was to identify sociodemographic and regional differences in the lack of access of aged Brazilians to medicines for SAH and/or DM in the last 30 days, in the years 2017, 2018 and 2019, based on data from the Telephone-based Surveillance of Risk and Protective Factors for Chronic Diseases (VIGITEL).

Methods

This is a cross-sectional study using data from VIGITEL for the years 2017, 2018 and 2019. VIGITEL is a national survey that, since 2006, has monitored the frequency and distribution of risk and protective factors for NCDs in Brazil, through annual telephone interviews with people aged 18 or over residing in households with fixed telephony and allocated in the 26 Brazilian capitals and the Federal District.

The sample selection is random, based on the registration of telephone lines, and performed in

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two stages. First, there is a systematic drawing of at least 5,000 telephone lines per capital, followed by the drawing of one resident per household until a minimum of 2,000 interviews per municipality are carried out, totaling an annual sample of approximately 54,000 individuals. The estimates were weighted in order to make the sample compatible according to sociodemographic characteristics[15]. More details on the sampling procedures can be accessed from the Ministry of Health documents. VIGITEL data is free and can be obtained on the DATASUS website (16).

For this study, the sample consisted of individuals aged 60 years or older who had a medical diagnosis of SAH and DM. The outcome, lack of access to medication for SAH and/or diabetes, was assessed based on the affirmative answer to at least one of the following questions: In the past 30 days, did you have been without any SAH medications for some time?", "In the past 30 days did you have been without any high to control diabetes for some time?", and "In the past 30 days, did you ran out of insulin?"

The independent variables were: sex (male; female), skin color (white; black/brown /indigenous/yellow), marital status (married or with a partner; single or separated; widowed), level of education (never studied; 1 to 7 years; 8 years or more), receiving *Bolsa Família* (no; yes), private health insurance (no; yes), and national macro-regions (Northeast; North; Center-West; Southeast; South).

For data analysis, initially a descriptive analysis was performed, using absolute and relative frequencies. The prevalence and respective 95% confidence intervals (95%CI) for the outcome in each of the years studied were described, using Pearson's chi-square test, for heterogeneity (no-

minal dichotomous and categorical variables) or linear trend (ordinal categorical variables), and an analysis adjusted for sociodemographic variables was performed using Poisson regression with robust variance adjustment to estimate the prevalence ratios (PR) and their respective 95%CI. The level of statistical significance used was 5% for two-tailed tests. All analyzes were performed using Stata software version 13.1.

The VIGITEL was approved by the National Commission for Ethics in Research for Human Beings of the Ministry of Health. Free and informed consent was obtained orally at the time of telephone contact with the interviewees.

Results

In 2017, 21.262 elderly people were interviewed by VIGITEL, of which 13.133 had SAH and/or diabetes. In 2018, were 20.981 elderly people, of which 12.943 had SAH and/or diabetes. And, in 2019, elderly sample was 23.327, of which 14.315 had SAH and/or diabetes. The prevalence of SAH and/or DM in the elderly was 64.4% (95%CI: 63.4; 65.1) in 2017, 64.7% (95%CI: 64.0; 65.4) in 2018 and 68.1% (95%CI: 67.5; 68.7) in 2019. In the three years studied, the proportion of self-reported SAH and/or diabetes was higher in female elderly, of color of white skin, who were married or with a partner, those with 1 to 7 years of study, who did not receive *Bolsa Família* and who had health insurance. In the Northeast region, the highest proportions of SAH and/or diabetes were identified in the three years of the surveys and in the South region, the lowest (**Table 1**).

TABLE 1 – Distribution of the aged (≥60 years) with SAH and/or DM according to sociodemographic variables. VIGITEL, Brazil. 2017. 2018 and 2019 (16).

Variable	2017 (n=13,133)		2018 (n=12,919)		2019 (n=14,288)	
	n	%	n	%	n	%
Sex						
Male	4,122	31.4	3,847	29.7	4,108	28.7
Female	9,011	68.6	9,096	70.3	10,287	71.3
Skin color						
White	6,472	58.1	6,048	55.3	6,596	53.7
Black/brown/yellow/indigenous	4,665	41.9	4,895	44.7	5,687	46.3
Marital status						
Married or with a partner	6,438	49.8	6,526	50.7	7,079	49.7
Single or separated	2,776	21.5	2,851	22.1	3,222	22.6
Widowed	3,713	28.7	3,503	27.2	3,955	27.7
Education						
Never studied	782	6.2	884	7.0	966	6.9
1 to 7 years	8,706	68.7	8,709	69.2	9,646	69.3
8 years or more	3,177	25.1	2,987	23.7	3,305	23.8
Receives Bolsa Família						
No	12,573	98.0	12,338	97.6	13,753	98.2
Yes	261	2.0	301	2.4	257	1.8
Health insurance						
No	5,240	40.2	5,539	43.1	6,225	43.8
Yes	7,788	59.8	7,298	56.9	7,978	56.2
Geographic region of residence						
Northeast	4,280	32.6	4,499	34.8	4,921	62.3
North	2,108	16.1	2,147	16.6	2,459	17.2
Midwest	2,525	19.2	2,116	16.4	2,451	17.1
Southeast	2,180	16.6	2,361	18.3	2,490	17.4
South	2,040	15.5	1,796	13.8	1,994	13.9

DM, diabetes mellitus; SAH, Systemic arterial hypertension; VIGITEL; Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases (16).

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The prevalence of the outcome, lack of access to medication to treat SAH and/or diabetes in the elderly, was 12.5% (95%CI:11.3; 13.7) in 2017, 12.1% (95%CI :11.0; 11.3) in 2018 and 11.9% (95%CI: 10.8; 13.1) in 2019 (**Figure 1**).
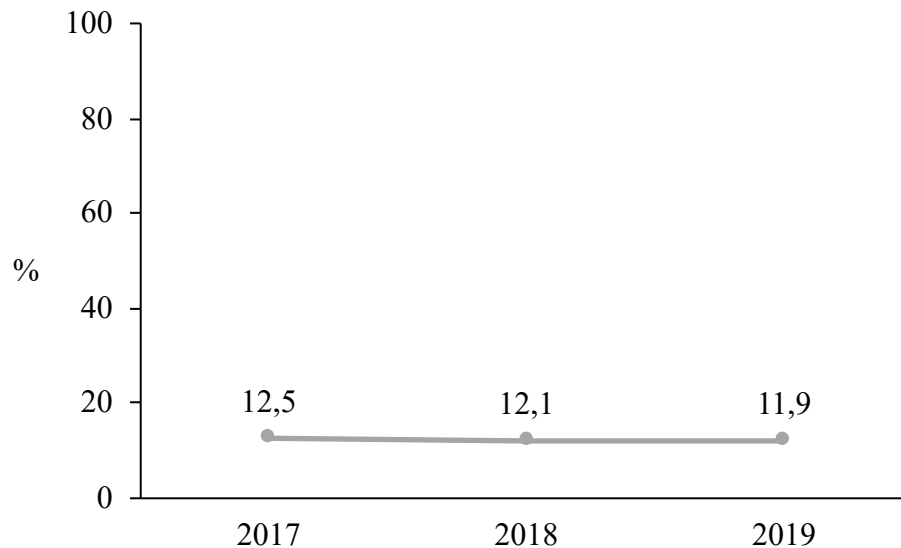

Figure 1 – Prevalence of lack of access to medication for SAH and/or DM in the elderly (≥60 years old) VIGITEL, Brazil, 2017, 2018 and 2019. DM, diabetes mellitus; SAH, Systemic arterial hypertension; VIGITEL; Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases (16).

Table 2 shows the prevalence and crude and adjusted prevalence ratios of lack of access to medication for SAH and/or DM according to sociodemographic variables. In the adjusted analysis, lack of access had a greater probability of approximately 30.0% in the three years studied in elderly people with black/brown/indigenous/yellow skin color (2017= PR:1.33, CI95%1.15; 1.78; 2018= PR: 1.28, CI95 1.00; 1.64; 2019= PR: 1.31, CI95% 1.04; 1.65), when compared with white elderly. An inverse relationship between education and the outcome was verified in the crude analysis, since the longer the study time, the lower the probability of lack of access in the analyzed period of 2017, 2018 and 2019, losing the magnitude of the effect when adjustment was performed. And for those who reported having a health plan, the lack of access to medication by the elderly for SAH and/or DM was lower compared to those who reported not having a health plan in 2017 (PR: 0.63, 95%CI 0.50; 0.81) and 2019 (PR:0.76; 95%CI 0.60; 0.95).

Also, regarding the geographic macro-region, it was found that in 2017 and 2018 the Southeast region had 44% and 32%, respectively, less probability of lack of access when compared to the Northeast region in the adjusted analysis.

Discussion

The present study identified that there was a small decrease in the lack of access to medication for SAH and/or DM between the years 2017, 2018 and 2019. However, the discontinuity of medication therapy in the last 30 months is unequal, with higher prevalence were those with black/brown/yellow/indigenous skin color, less educated, beneficiaries of *Bolsa Família*, without private health insurance and residents in the Northeast and North regions.

The lack of access to medicines for the treatment of NCDs in the aged was similar in different studies carried out in Brazil over the past 10 years, which found prevalence between 3% and

TABLE 2 – Prevalence, crude and adjusted analysis of associations between lack of access to medication for SAH and/or DM and sociodemographic characteristics of Brazilian elderly (≥60 years). VIGITEL, Brazil, 2017, 2018 and 2019.

Variables	Lack of access to medication for hypertension and/or diabetes								
	2017			**2018**			**2019**		
	n (%)	**PRC (95%CI)**	**PRA (95%CI)***	**n (%)**	**PRC (95%CI)**	**PRA (95%CI)***	**n (%)**	**PRC (95%CI)**	**PRA (95%CI)***
Sex									
Male	111 (12.0)	1.00	1.00	107 (11.7)	1.00	1.00	116 (12.3)	1.00	1.00
Female	262 (12.7)	1.06 (0.86;1.30)	0.96 (0.73;1.23)	261 (11.2)	1.1 (0.85;1.30)	1.04 (0.80;1.35)	283 (11.8)	0.96 (0.78;1.17)	0.99 (0.78;1.27)
Skin color									
White	134 (9.8)	1.00	1.00	124 (9.5)	1.00	1.00	135 (9.5)	1.00	1.00
Black/brown/yellow/indigenous	154 (14.0)	1.43 (1.15;1.78)	1.33 (1.05;1.70)	165 (13.6)	1.43 (1.15;1.78)	1.28 (1.00;1.64)	189 (13.5)	1.42 (1.15;1.74)	1.31 (1.04;1.65)
Marital status									
Married or with a partner	179 (12.2)	1.00	1.00	183 (12.0)	1.00	1.00	195 (11.6)	1.00	1.00
Single or separated	62 (10.9)	0.80 (0.68;1.17)	0.83 (0.59;1.17)	80 (12.6)	0.95 (0.74;1.21)	0.96 (0.72;1.28)	95 (13.6)	0.86 (0.68;1.08)	0.92 (0.70;1.21)
Widowed	124 (13.7)	1.22 (0.91;1.39)	1.12 (0.85;1.49)	102 (11.6)	0.92 (0.70;1.21)	0.96 (0.69;1.34)	108 (11.3)	0.83 (0.64;1.07)	0.87 (0.64;1.17)
Education									
Never studied	40 (17.7)	1.00	1.00	43 (16.9)	1.00	1.00	51 (18.1)	1.00	1.00
1 to 7 years	261 (12.6)	0.71 (0.53;0.97)	0.75 (0.52;1.10)	258 (11.9)	0.70 (0.52;0.94)	0.79 (0.54;1.15)	285 (12.0)	0.66 (0.50;0.87)	0.74 (0.53;1.05)
8 years or more	50 (8.5)	0.48 (0.33;0.71)	0.62 (0.38;1.01)	54 (9.9)	0.58 (0.40;0.85)	0.75 (0.46;1.21)	53 (9.0)	0.50 (0.35;0.71)	0.66 (0.42;1.03)
Receives Bolsa Família									
No	349 (12.2)	1.00	1.00	348 (12.0)	1.00	1.00	375 (11.8)	1.00	1.00
Yes	14 (22.6)	1.85 (1.15;2.96)	1.56 (0.91;2.70)	13 (15.3)	1.27 (0.76;2.12)	0.97 (0.48;1.95)	16 (20.5)	1.74 (1.12;2.73)	1.41 (0.81;2.47)
Health insurance									
No	211 (16.4)	1.00	1.00	212 (14.8)	1.00	1.00	229 (14.7)	1.00	1.00
Yes	158 (9.4)	0.57 (0.47;0.70)	0.63 (0.50;0.81)	152 (9.5)	0.64 (0.53;0.78)	0.80 (0.63;1.03)	165 (9.4)	0.64 (0.53;0.77)	0.76 (0.60;0.95)
Geographic region of residence									
Northeast	159 (15.3)	1.00	1.00	155 (14.1)	1.00	1.00	167 (13.8)	1.00	1.00
North	53 (12.5)	0.82 (0.61;1.09)	0.88 (0.63;1.23)	63 (13.4)	0.95 (0.72;1.24)	1.08 (0.79;1.47)	61 (11.3)	0.82 (0.62;1.08)	0.84 (0.61;1.14)
Midwest	62 (11.0)	0.72 (0.55;0.95)	0.84 (0.61;1.17)	63 (12.4)	0.88 (0.67;1.15)	0.92 (0.68;1.30)	60 (10.8)	0.79 (0.60;1.04)	0.76 (0.55;1.05)
Southeast	50 (9.4)	0.61 (0.45;0.83)	0.56 (0.39;0.81)	49 (8.5)	0.60 (0.44;0.82)	0.68 (0.48;0.98)	69 (11.5)	0.83 (0.64;1.09)	0.85 (0.63;1.15)
South	49 (11.3)	0.74 (0.55;1.00)	0.87 (0.61;1.24)	38 (9.5)	0.67 (0.48;0.92)	0.78 (0.52;1.17)	42 (9.7)	0.70 (0.51;0.97)	0.86 (0.60;1.27)

95% CI: 95% confidence interval; PRA: DM, diabetes mellitus; prevalence ratio adjusted; PRC: prevalence ratio crude; SAH, Systemic arterial hypertension; VIGITEL; Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases (16). *adjusted for gender, skin color, marital status, education, receiving *Bolsa Família*, having a health plan national macro-region of residence.

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13% (10). However, these studies emphasize that possibly there is no regularity in access to medicines, varying between regions, characteristics of the home, access to education and family income, population, and age groups (3, 17, 18).

In this study, it was evidenced that the aged with black/brown/yellow skin and indigenous people had less access to medicines for continuous use for the care of SAH and/or DM. Studies carried out in developing countries have also shown that not being white is a factor that makes access to drug therapies difficult (3, 19, 20). Reinforcing the latent presence of inequity in access to health care, showing the need for a closer look by primary care professionals to this population, especially with regard to the maintenance of drug therapy for NCDs.

It was observed that education is an important indicator of lack of access, since the aged with less education are those who have greater lack of access to medicines. Education is directly related to income and, therefore, aged with higher education tend to have greater purchasing power for the purchase of medicines, while those with less education depend almost exclusively on the dispensation of free medicines by SUS or low cost in the popular pharmacy (3, 17). individuals with less education have the continuity of drug treatment for chronic diseases, more linked to dispensing in primary care services or in the popular pharmacy, reinforcing the relevance of coverage of less economically favored population segments (17).

The aged beneficiaries of *Bolsa Família* also had a higher prevalence of lack of access in this study. *Bolsa Família* is a policy of direct income distribution with the objective of reducing poverty and extreme poverty and, therefore, being a beneficiary of the program is a proxy for low income and education. The beneficiaries of the program have worse health indicators and a greater tendency for the development of NCDs (15). Thus, the result demonstrates the need to maintain social policies for the aged with worse socioeconomic conditions, since they are more susceptible to worse health conditions and greater morbidity and mortality (21).

Hypertensive and / or diabetics without health insurance had a greater lack of access to medication, similarly to the research conducted by Castro et al. (22), who found significant correlations between the individual with health coverage, because the lower the chance of coverage, the greater the difficulty accessing medicines. Currently, there is a strong campaign for the privatization of health and the popularization of private plans, offering plans of dubious quality, with low cost and discounts on medical and hospital expenses. According to data from the National Health Agency, between 2018 and 2019 there was an increase of 72.1 thousand users of private plans, with greater growth in the Southeast region of the country (23). Even so, the hiring of a private health plan is a reality for a small portion of the population due to its monthly cost, with most of the population with NCDs using SUS. Once again, the results of this study reinforce the inequality in access to medicines for SAH and/or DM by the socially vulnerable, reinforcing the need for investments in qualifying primary care and, specifically, in pharmaceutical assistance provided by the unified health system.

Regarding the lack of medication in different regions of Brazil, it was observed that the North and Northeast had a greater occurrence of this problem. Different studies reinforce this finding and suggest that this disparity occurs due to economic and management differences between the regions and the lack of equity in the distribution of resources and inputs (10, 17).

Although Brazil has as a principle universal access to public sector drug therapies, the results of this research show that guaranteeing this right is still a major challenge (24, 25). The principles of universality and equal access to health services, recommended by SUS, are still far from being a reality, since access to medicines is still uneven and varies according to the regions of the country and the sociodemographic characteristics of the aged. However, it is relevant to state that the structure, financing, and organization between regions are decisive in the impact of access to medicines (26).

The main limitation of the study is the use of telephone interview data, covering only individuals with landlines and residents in the capitals of Brazilian states and the Federal District, limiting their representativeness, which, however, was minimized using data weighting factors. It should also be considered

that the differences between the economic variables may be underestimated, since the possession of a landline is usually related to higher income and education, therefore, even with the weighting factors, it is possible that the differences found are still bigger.

As a highlight of the study is the contribution to the knowledge of the prevalence of lack of access to medicines for SAH and/or DM in Brazilian aged, based on three representative national epidemiological surveys, which can be useful to monitor this health risk outcome of Brazilian aged with these chronic conditions, as well as showing that there is inequity in access to medicines for SAH and/or DM in the Brazilian population.

Therefore, the study pointed out positive aspects, such as the slight drop in the outcome in the analyzed period. However, the results indicate marked inequalities in access to drug treatment for SAH and/or DM. The findings reinforce the need to expand social policies for the provision of income and medicines and demonstrate the relevance of SUS in promoting equity and universality of access, especially among the aged with the worst socioeconomic conditions. From these results, it is recommended to carry out further research that seeks to understand whether aspects of the primary care work process can reduce the lack of access to drug treatment for SAH and/or DM.

Notes

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Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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