








The influence of the Family Health Strategy on hypertensive adults in health care use in Brazil

A influência da Estratégia Saúde da Família no uso de serviços de saúde por adultos hipertensos no Brasil

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ABSTRACT: *Introduction:* Systemic arterial hypertension (SAH) has a high prevalence in Brazil and impacts on the use of health services. *Objective:* This study verified the influence of the Family Health Strategy (FHS) on the use of health services by adults ≥ 18 years old who reported SAH in the National Health Survey (*Pesquisa Nacional de Saúde* – PNS) 2013. *Methods:* The Propensity Score (PS) method was used to correct the lack of homogeneity between the groups with SAH under exposed or not to the FHS. PS was estimated using binary logistic regression, which reflected the conditional probability of receiving the household register in the FHS according to socioeconomic, demographic and health covariates of adults and their families. After estimating the PS, the stratification was used to group hypertensive adults into five mutually exclusive strata (pairing them). Prevalence and confidence intervals at 95% were estimated of medical consultations and hospitalizations. The effects of the complex NHS sampling were incorporated into all phases of the analysis. *Results:* It was verified that hypertensive adults enrolled in FHS had worse socioeconomic, health and health conditions, but similar prevalence of medical consultations and hospitalizations to adults without a FHS registry and with better living and health conditions. The FHS has attenuated individual and contextual inequalities that impact the health of Brazilians by favoring the use of health services. *Conclusion:* The FHS can favor the care and control of SAH in Brazil. Thus, it must receive investments that guarantee its effectiveness.

Keywords: Adult. Hypertension. Family health. Health services. Health surveys.

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RESUMO: *Introdução:* A hipertensão arterial sistêmica (HAS) tem elevada prevalência no Brasil e impactos no uso de serviços de saúde. *Objetivo:* Este estudo verificou a influência da Estratégia Saúde da Família (ESF) no uso de serviços de saúde por adultos com idades igual ou superiores a 18 anos que referiram HAS na Pesquisa Nacional de Saúde (PNS) 2013. *Métodos:* Utilizou-se o método de escore de propensão (EP) para corrigir a falta de homogeneidade entre os grupos com HAS expostos ou não à ESF. Estimou-se o EP por meio de regressão logística binária, o qual refletiu a probabilidade condicional de receber o cadastro do domicílio na ESF segundo covariáveis socioeconômicas, demográficas, sanitárias e de saúde dos adultos e de suas famílias. Após se estimar o EP, utilizou-se o pareamento por estrato (estratificação) para se agrupar os adultos hipertensos em cinco estratos mutuamente excludentes. Foram estimados as prevalências e os intervalos de confiança a 95% de consultas médicas e internações hospitalares. Incorporaram-se os efeitos da amostragem complexa da PNS em todas as fases da análise. *Resultados:* Verificou-se que adultos hipertensos cadastrados na ESF tinham piores condições socioeconômicas, sanitárias e de saúde, mas semelhante prevalência de consultas médicas e de internação hospitalar aos adultos sem cadastro na ESF e com melhores condições de vida e saúde. A ESF atenuou desigualdades individuais e contextuais que impactam a saúde dos brasileiros ao favorecer o uso de serviços de saúde. *Conclusão:* A ESF pode favorecer o atendimento e controle da HAS no Brasil. Assim, deve receber investimentos que garantam sua efetividade. *Palavras-chave:* Adultos. Hipertensão arterial sistêmica. Saúde da família. Serviços de saúde. Inquéritos epidemiológicos.

INTRODUCTION

Systemic arterial hypertension (SAH) is a multifactorial clinical condition characterized by high prevalence and low control rates among adults, affecting about 1 billion people worldwide¹. In Brazil, the prevalence of hypertensive adults has progressively increased in recent years²: it ranges from 21.4% (95% confidence interval*=% (95%CI) 20.8 – 22.0)² to 24.1% (95% CI 23.4 – 24.8)³ among population-based studies conducted in 2013, representing around 36 million by that year¹.

Besides being a disease, hypertension is also the most common and reversible risk factor for cardiovascular diseases⁴. Its occurrence is a major cause of premature death and loss of quality of life — with a high degree of limitation and disability — and is responsible for high demands on health care, work absenteeism, rising costs for families, communities and health and social security systems^{2,5}.

Among its risk factors are heredity, race, age, gender, overweight, stress, physical inactivity, high sodium intake, low educational level, presence of associated comorbidities, contextual characteristics and housing location^{2,5,6}. The disease has an asymptomatic character, which may delay its diagnosis. Proper treatment requires adequate and regular clinical evaluations, a condition less common in lower income groups, education or residents in more remote areas and with poorer social and health infrastructure^{2,7}. On the other hand, the excessive medication, its high cost, the side effects and the insufficient time for patient orientation favor the non-adherence to the treatment. All these factors contribute to the adequate control of blood pressure levels in less than one third of its carriers⁴.

Also pointed out as the main factors for ineffective control of SAH are the low number of health consultations, non-adherence to treatment, incorrect pharmacological treatment and little change in lifestyle and health behaviors of hypertensive patients. These factors also increase the risk of complications due to the disease, which may induce a higher frequency of hospitalizations⁸.

Thus, the performance of Primary Health Care (PHC) becomes essential for the recognition and monitoring of hypertensive adults. This is described as the sphere of the health system that offers entry into the health network, configuring individual and collective health actions that encompass interventions for disease prevention, diagnosis, treatment, rehabilitation, harm reduction and health maintenance with communities and in the social context⁹.

In the context of diseases such as SAH, the Family Health Strategy (FHS) can increase the use of medical appointments, promote treatment and maintenance of controlled blood pressure levels, according to the patient's characteristics, and help reduce the risk of cardiovascular diseases. Thus, it may decrease hospitalizations, and improve the quality of life and well-being of these individuals^{10,11}. In this sense, this study verified the main social determinants of the registration of households in the FHS and the influence of this strategy on the use of health services by adults who reported SAH in the National Health Survey (*Pesquisa Nacional de Saúde – PNS*) 2013.

METHODS

DATA SOURCE

The PNS 2013 was conducted by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística – IBGE*) in partnership with the Ministry of Health (*Ministério da Saúde – MS*)^{12,13}. This is a household survey that sought to obtain information representative of the Brazilian population about their living and health conditions. This research had three questionnaires: about the household; an individual one, to be answered by all its residents; and another individual one, to be answered by a sample of residents 18 years old or older randomly selected among all residents of the selected household¹².

The questions module, which generated the set of information of interest used in this research, was addressed to adults (≥ 18 years of age) selected to answer the individual part. Among these, 12,500 reported hypertension (blood pressure), but the inclusion criterion was information on the registration in the FHS of the household of these adults, resulting in a final eligible population of 11,211 adults.

EXPOSURE VARIABLES AND OUTCOMES

To measure the effect of being exposed to the domicile registration in the FHS, two comparison groups were defined:

- exposed group, corresponding to adults ($n = 7,213$) who reported living in households registered with the FHS;
- unexposed group, which includes adults who reported not living in FHS registered households ($n = 3,998$).

Exposure information was collected from the PNS through the question “Is your household registered in the family health unit?” (Yes = 1 or No = 0).

The health outcomes studied were two health measures that reflect the use of health services: medical consultations and referral for hospitalization for a period equal to or greater than 24 hours, both occurring in the last 12 months. Both indicators were obtained by converting the number of consultations and hospitalizations into dichotomous variables (Yes = 1 or No = 0). The affirmative answer was ≥ 1 medical consultation and ≥ 1 hospitalization.

CONTROL COVARIATES

Among the covariates used are: gender (male or female), age (in years), color/race (white or non-white), presence of disabilities — physical, intellectual, auditory or visual (yes or no) —, having health insurance (yes or no), presence of chronic comorbidities (yes or no); looking for the same place, doctor or health service for health care (yes or no); household (urban or rural), country macro-region (North, Northeast, Midwest, Southeast or South), area of domicile location (capital/metropolitan region or the rest of the state), type of household (house/apartment or tenement), number of residents in the household, suitable material for wall construction (yes or no), suitable material for roof construction (yes or no), suitable material for floor construction (yes or no); access to running water (yes or no); household water treatment (yes or no); number of rooms in the household, number of toilets in the household, destination of toilet waste (general network or septic tank/open pit); regular garbage collection (yes or no); electricity at home (yes or no); having a landline/cell phone (yes or no); number of appliances; car ownership (yes or no); education (no education/incomplete elementary school, complete elementary school/to incomplete or complete college).

DATA ANALYSIS

To control the lack of homogeneity between the comparison groups, in terms of their individual and contextual socioeconomic, demographic, health and health covariates, the two-step propensity score (PS) was used. Initially, the PS was defined according to the conditional probabilities of the adult being exposed to their household in the FHS, given the set of covariates observed. This score represents a single measure that, simultaneously, considers all potential covariates of confusion. Individuals with the same PS have the same covariate distribution observed, regardless of their exposure condition¹⁴⁻¹⁷.

The PS was estimated by binary logistic regression with the maximum likelihood method. Each adult under analysis had a conditional probability (a propensity) to be exposed given the covariates measured in the proposed model. Then, the stratification (or subclassification) method was used, which involves the grouping of all units of the sample into mutually exclusive strata, defined according to specific percentiles of the PS distribution, which allowed the pairing of units by stratum^{15,17–20}. In this study, five strata (quintiles or subclasses of the PS) were created^{15,19}.

With stratification, it is expected that the samples of hypertensive adults living in households registered in the FHS and those not registered will be more similar in their average attributes and propensity to exposure than before stratification, allowing to compare, with greater validity, the results of interest. Thus, within each stratum, the effect of exposure on outcome can be estimated by direct comparison between the study groups^{15,19}.

For adults in the exposed and unexposed group, the proportion (mean for numerical variables) and the standard error of the covariates selected to compose the PS estimation model were estimated, in order to verify the distribution pattern of these covariates between the study groups. Analysis of variance (F statistics) was performed to verify the level of statistical significance of the unbalance of covariates before and after the control by PS^{16,18} stratification, reaching homogeneity when the test probability was > 0.05 ^{16,18}. Box plot graphical analyses were performed to demonstrate the pattern of distribution of the estimated probability of PS between the study groups, before and after the stratification of this score^{16,19}.

Prevalence and 95% CI were estimated for medical consultations and hospitalization according to the exposure variable among the quintiles of the PS. Then, the specific estimates of the effect of exposure by stratum were grouped to estimate the mean treatment effect, which represents the weighted average with weights equal to the proportion of individuals within each stratum²⁰. Statistically significant differences at the 5% level were considered in the absence of 95% CI overlap.

All analyzes were performed using SPSS® software (version 23, SPSS Inc., Chicago, Illinois), incorporating the effects of the PNS 2013 complex sampling plan at all stages of the analyses performed¹⁶.

ETHICAL ASPECTS

The PNS was approved by the National Research Ethics Commission (Case No. 328.159 of June 26th, 2013), and all participants signed an informed consent form¹².

RESULTS

Among the 11,211 hypertensive adults aged 18 years old or older studied, the median age was 57 years (46–68) and the prevalence of households registered in the FHS was 63.3%

(95%CI 61.3 – 65.2). It was found that the hypertensive adult population exposed to the FHS, compared to the unexposed one, was predominantly composed of women, middle aged (<60 years), non-white, with worse education levels, dependent on the Unified Health System (*Sistema Único de Saúde – SUS*), who sought the same place, doctor or health service in health care, with a higher prevalence of chronic comorbidities and bodily disabilities, who lived in rural areas of the northeast of the country, outside the capital/metropolitan region, with worse material infrastructure of the households and neighborhoods where they lived, such as: worse possession of goods (number of rooms, toilets, appliances, telephones, and cars) and services (greater precariousness of water supply and treatment, destination of toilet waste, and collection of household waste) (Table 1). The F statistic showed a reduction in magnitude and the loss of statistical significance of variance of covariates between study groups after PS stratification. Homogeneity was achieved for most covariates that were unbalanced before stratification between the comparison groups (Table 1).

Figure 1 shows the estimated PS distribution for the exposed and unexposed group. Adults living in FHS registered households were more likely to be attended at the FHS than those living in non-registered households. When considering these probabilities among the quintiles (subclasses), it was observed that the comparison groups became more homogeneous regarding the distribution of their individual and contextual socioeconomic, demographic, sanitary and health covariates (Figure 2).

There was a high prevalence of medical appointments in all study and quintile groups. These ranged from 82.0% (95%CI 75.0 – 88.0) to 94.0% (95%CI 91.0 – 97.0). The prevalence of hospitalization was lower and did not exceed 12.0% (95%CI 10.0 – 15.0). In each PS subclass, among study groups, estimates of health service use varied little or fluctuated with increasing PS quintile. Among the quintiles, a 95%CI overlap was observed in both outcomes, with statistically significant difference only in the second quintile of the PS in both outcomes. However, after direct adjustment between the quintiles (subclasses), it was seen, in the exposed one, a positive and statistically significant influence of the FHS on the use of medical appointments (91.0%; 95%CI 90.4 – 91.6) and hospitalizations (27.0%; 95%CI 26.0 – 28.0) compared to those not exposed (Table 2).

DISCUSSION

The results indicated that the living and health conditions of the selected hypertensive adults from PNS 2013 were not the same among the groups exposed and not exposed to the FHS. Similar to previous research, significant differences in individual and contextual socioeconomic, demographic, sanitary and health characteristics were observed between the groups of adults evaluated^{5,10,21–24}.

In this study, in the group of exposed hypertensive adults, compared to the unexposed one, there is a predominance of poor women, who depend more on public health services, live in contexts of worse socioeconomic, material and health conditions. However, despite

Table 1. Distribution and comparison of the socioeconomic, demographic, sanitary and health covariates of adults ≥ 18 years of age who reported systemic arterial hypertension ($n = 11,211$) living in households registered or not in the Family Health Strategy (FHS) and analysis of variance (F statistic) before and after quintile control (subclass) of estimated propensity score, National Health Survey, Brazil, 2013.

Covariates	Register of the household at the FHS		F statistics Before stratification ^b	F statistics After stratification ^c
	Yes (n = 7,213)	No (n = 3,998)		
	% (standard error) ^a	% (standard error) ^a		
Male	38.0 (1.0)	43.0 (1.0)	11.85*	0.33
Mean age (in years)	56.7 (0.325)	57.2 (0.382)	0.98	0.67
Non-White color/race	55.0 (1.1)	43.0 (1.3)	64.48*	3.7
Education — uneducated /incomplete elementary education	64.0 (1.2)	44.0 (1.4)	355.715*	0.93
Education — complete elementary to incomplete higher education	30.0 (1.1)	37.0 (1.3)	64.11*	0.74
Education — complete higher education	6.0 (0.5)	18.0 (1.3)	336.56*	9.14*
Presence of some kind of disability	16.0 (0.8)	14.0 (1.0)	7.47*	0.36
Having health insurance	23.0 (1.0)	47.0 (2.0)	521.98*	0.20
Presence of comorbidities	65.0 (1.0)	63.0 (1.3)	7.99*	1.87
Looking for the same place, doctor/service for health care	82.0 (1.0)	80.0 (1.1)	38.97*	7.68*
Urban situation of the household	84.0 (0.6)	94.0 (0.5)	214.92*	0.23
Location of the household in the capital/metropolitan region	31.0 (0.9)	51.0 (1.5)	631.18*	34.2*
Macroregion of the country				
North	5.0 (0.3)	5.0 (0.3)	0.64	9.4*
Northeast	29.0 (0.9)	15.0 (0.8)	111.15*	6.2**
Midwest	7.0 (0.4)	7.0 (0.4)	26.60*	22.40*
Southeast	42.0 (1.2)	58.0 (1.3)	84.47*	0.0
South	17.0 (0.8)	15.0 (0.9)	4.6**	19.40*
Lives at a house/an apartment	99.0 (0.0)	99.0 (0.1)	4.53**	0.42
Mean number of residents in the household	3.35 (0.042)	3.14 (0.046)	36.24*	1.78
Adequate material in the construction of the walls of the household	92.0 (0.5)	95.0 (0.6)	34.28*	2.72
Adequate material in the construction of the roof of the household	97.0 (0.4)	98.0 (0.5)	13.33*	1.60
Adequate material in the construction of the floor of the household	68.0 (1.0)	75.0 (1.0)	105.94*	8.0**
Access to running water	95.0 (0.4)	97.0 (0.4)	52.01*	7.79**
Home water treatment	72.0 (0.1)	80.0 (1.2)	132.60*	16.27*
Mean number of rooms in the household	6.21 (0.044)	6.78 (0.101)	57.22*	0.98

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Table 1. Continuation.

Covariates	Register of the household at the FHS		F statistics Before stratification ^b	F statistics After stratification ^c
	Yes (n = 7,213)	No (n = 3,998)		
	% (standard error) ^a	% (standard error) ^a		
Mean number of toilets in the household	4.25 (0.017)	4.66 (0.035)	281.43*	0.28
Bathroom waste disposal for general network	56.0 (1.2)	76.0(1.2)	455.22*	10.40*
Regular collection of household waste	88.0 (0.6)	95.0 (0.5)	152.50	0.31
Electricity at home	99.0 (0.1)	99.0 (0.1)	0.41	0.44
Having landline or cell phone	93.0 (0.4)	96.0 (0.4)	47.54*	1.20
Mean number of household appliances	5.0 (0.059)	6.46 (0.094)	475.72*	0.44
Car ownership	42.0 (1.1)	58.0 (1.4)	160.69*	1.46
Total	63.0 (0.1)	37.0 (0.1)	--	--

^aEstimates carried out by incorporating all the characteristics of the complex sampling plan of the National Health Survey, Brazil, 2013; ^bF statistic = T statistic of the square of two samples; ^cF statistic for the mean effects of household registration in the Family Health Strategy after the adjustment by quintile (subclasses) of the propensity score estimated according to the covariates presented in the table; *0.0001; **0.05 > p > 0.01.

the overlap of risk factors, being linked to the FHS has brought important gains for the use of health services, as these adults had a similar prevalence of medical appointments and hospitalization, even when they had a worse life and health situation. The results suggest that the FHS can mitigate the effects of individual and contextual inequalities that impact the health of hypertensive people by positively favoring the use of health services even when they have unfavorable living conditions and health.

In Brazil, hypertension increases the demand for health actions and services and the FHS contributes to meet the growing needs associated with hypertension. The historical context of the creation of public health policies in the country allowed for the creation of the SUS and the change in the health care model with the implementation of the FHS. This condition allowed the capillarization of health actions and services in different locations and for different population groups. Thus, the FHS assists users in socioeconomic situations and less favorable living and health conditions, which contributes to the reduction of social inequities in health and ensures the search for the quality of life and well-being of its users^{22,23}.

A previous study showed the health impact of the expansion of the FHS from 2000 to 2013, indicating a reduction in avoidable mortality in registered individuals, especially in the self-reported black or brown population. The study also showed that the expansion of the FHS promotes a reduction in mortality from cardiovascular diseases, such as SAH, by 12.9 and 7.1% in black or brown and white users, respectively²⁴. Thus, the research corroborates the idea that the FHS contributes to the improvement of the health conditions of its assisted populations, especially by reducing inequities in the use of health services.

The present study pointed out that hypertensive patients under the FHS as a regular source of care also have high accessibility to health, which may positively favor medical consultations and the balance of hospitalization rates. Part of these hypertensive individuals with regular ties with the FHS live in socioeconomic unfavorable contexts and with poor and fragile health, social and leisure infrastructure. Therefore, it was necessary to use the PS to control the systematic differences of the covariates and the lack of homogeneity between the analysis groups. Making the groups more comparable to each other, and having the only important difference between them is the condition of registration with the FHS. Although this control allowed us to identify the influence of the FHS on the studied outcomes, this difference was not so important in relation to non-registered adults. However, the findings suggest that adults exposed to the FHS have their demands met by presenting similar levels of use of health services than those observed in socioeconomically more favored adults. Indicating that, especially among vulnerable populations with the same diagnosis of established morbidity, the FHS can mitigate individual and contextual inequalities that impact on health.

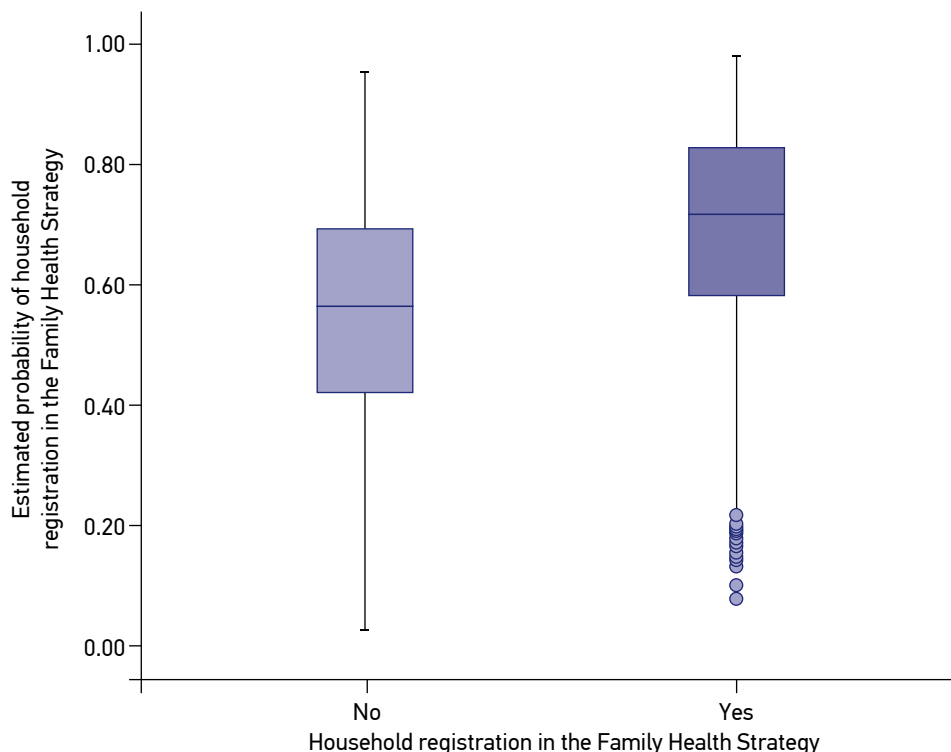


Figure 1. Estimated probability of household registration in the Family Health Strategy (FHS) of adults ≥ 18 years of age who reported systemic arterial hypertension ($n = 11,211$) according to a set of covariates used to estimate propensity score, National Health Survey, Brazil, 2013.

The direct fit between the quintiles showed that hypertensive patients exposed to the FHS had a higher prevalence of medical appointments and hospitalization than the unexposed group. The regularity of medical appointments reflects directly on the care of hypertensive patients, but this is not the only factor that contributes to treatment adherence — control and reduction of the risks of decompensation of hypertension and hospitalization also contribute. The FHS teams should adopt the integral approach to care, with risk assessment and adoption of health promotion measures.

Interdisciplinary actions in the care of these groups should be valued; not only the care centered on the figure of the physician, but also the multidisciplinary work, which considers the socio-cultural context and individual demands of each patient²⁵. Thus, among Brazilian municipalities, there are wide variations in the capacity and quality of FHS teams, including the varied availability of basic, human and institutional support equipment offered to them. Characteristics of services and physical, human and health resources

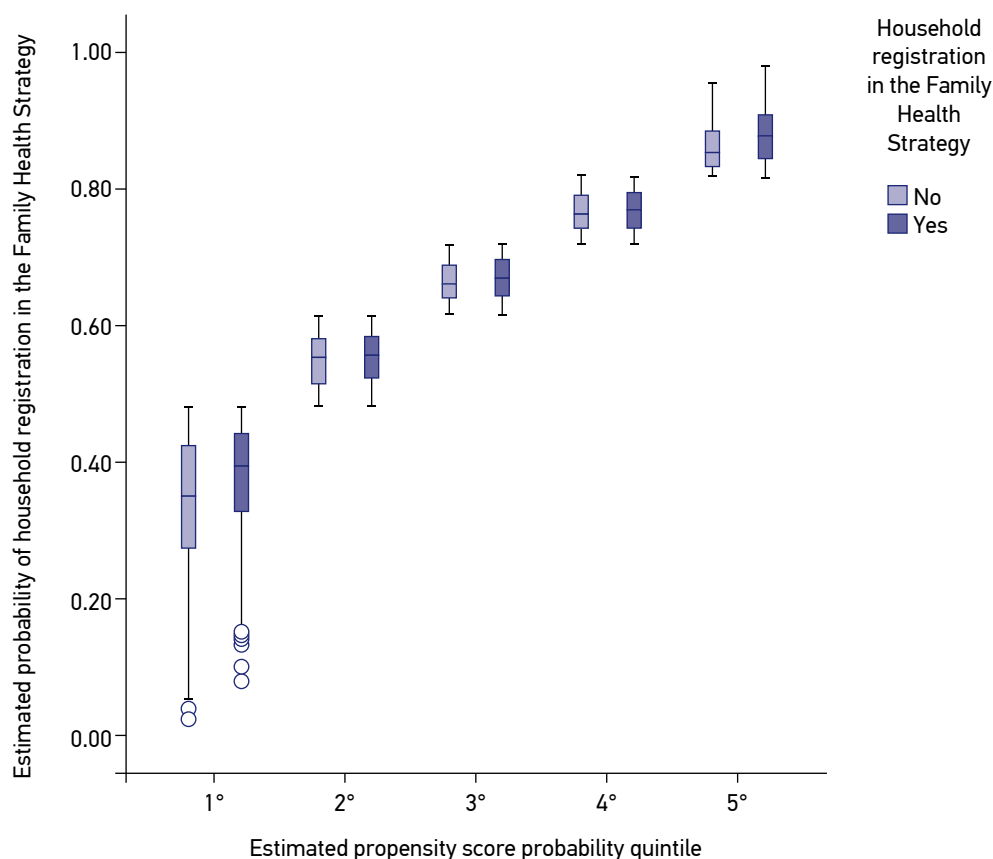


Figure 2. Balancing within quintiles (subclasses) of estimated probability of propensity score according to household registry in the Family Health Strategy (FHS) of adults ≥ 18 years of age who reported systemic arterial hypertension ($n = 11,211$), National Survey of Health, Brazil, 2013.

facilitate or limit their use by users and impact their effectiveness and quality of attention to hypertension. This combination of individual, contextual and institutional factors may explain the higher hospitalization of those enrolled in the FHS in the direct adjustment between quintiles.

The set of actions of the FHS is fundamental for the confrontation of chronic noncommunicable diseases, especially because hypertension is a sensitive problem to PHC actions. At this level of attention, there are promotion measures, health surveillance, prevention and longitudinal monitoring of users⁹. From this perspective, hypertension is one of the focus of FHS' work, as it is a highly prevalent disease in Brazil¹⁻³ and because of the complications it can cause to its bearers^{1,2}. The FHS also assists in guiding, monitoring pharmacological and non-pharmacological treatments and changing the lifestyle in hypertensive patients¹¹.

Regarding this national conjuncture, although access and use of health services have increased in the country in recent years, this study showed that there are still significant socioeconomic, regional and gender differences²⁶ in the FHS registry. Access is directly associated with the availability of services directed to the population, and the obstacles inherent

Table 2. Prevalence of medical consultations and hospitalization among adults ≥ 18 years of age who reported systemic arterial hypertension ($n = 11,211$) residents of households registered or not in the FHS, after adjusting the estimated propensity score by quintile (subclasses), National Health Survey (PNS), Brazil, 2013.

Quintiles (subclasses) ^a	Treatment groups	Number of hypertensives	Medical appointments ^b		Hospitalization ^b	
			%	(95%CI)	%	(95%CI)
1 st	With FHS	812	94.0	(91.0 – 97.0)	10.0	(7.0 – 14.0)
	Without FHS	1,430	94.0	(92.0 – 96.0)	10.0	(8.0 – 12.0)
2 nd	With FHS	1,252	92.0	(90.0 – 94.0)	11.0	(8.0 – 14.0)
	Without FHS	990	85.0	(81.0 – 89.0)	5.0	(3.0 – 7.0)
3 rd	With FHS	1,492	90.0	(88.0 – 93.0)	9.0	(7.0 – 12.0)
	Without FHS	751	87.0	(83.0 – 91.0)	11.0	(7.0 – 14.0)
4 th	With FHS	1,715	90.0	(87.0 – 92.0)	10.0	(7.0 – 13.0)
	Without FHS	527	84.0	(80.0 – 89.0)	10.0	(6.0 – 14.0)
5 th	With FHS	1,942	90.0	(88.0 – 92.0)	12.0	(10.0 – 15.0)
	Without FHS	300	82.0	(75.0 – 88.0)	11.0	(6.0 – 17.0)
Directly adjusted between quintiles (subclasses)	With FHS	7,213	91.0	(90.4 – 91.6)	27.0	(26.0 – 28.0)
	Without FHS	3,998	88.0	(87.0 – 89.0)	9.0	(8.2 – 9.8)

FHS: Family Health Strategy; ^abased on estimated propensity score; ^bestimations performed incorporating all the characteristics of the complex sampling plan of the National Health Survey, Brazil, 2013.

to this access are, in turn, related to the particular characteristics of the implementation and maintenance of the health services network in different contexts. The largest supply of medical appointments still occurs in the South and Southeast, which have the best living conditions and the highest Human Development Index (HDI). Thus, it is understood that it is essential to improve the FHS to reduce local and regional health inequalities. Hypertensive men had lower adherence to FHS compared to hypertensive women. This condition, coupled with the risks of sex-dependent morbidity and mortality, has important impacts on differences in the use of the entire health system and on the health levels of these groups.

However, the interpretation of the findings may be limited by some issues. One is the possible effects of reverse causality. Another refers to the proposed PE model, as these scores are conditioned to the measured covariates included in the model and, therefore, do not control the unmeasured or imperfectly measured variables¹⁷.

In this study, the control of the measured covariates that can reveal the contextual and compositional socioeconomic level of the families of the adults under study was performed. The difference between being registered (yes or no) in the FHS and having obtained consultations was not as relevant as expected. In part, the absence of major differences is due to the high prevalence of medical appointments in all groups, which may be associated with hypertension (morbidity common to groups); the variations in the percentage of coverage, quality, structure and work dynamics of the FHS, which may have balanced the magnitude of the observed differences; and the characteristic that the Brazilian health system is a public-private mix that may lead adults with the same morbidity to use public, private or supplementary health services, which may not only impact on the magnitude of estimated prevalence, but also on the quality of life, attention and control of SAH.

Finally, it should be considered that hypertension in the PNS is a morbidity reported by the interviewee according to the diagnosis attributed by the doctor, and the level of sensitivity and specificity of the issue may affect the population prevalence of this morbidity. However, this method has a lower prevalence bias than the self-reported disease measure²⁷. Even so, the method used in the PNS does not prevent the possible association of the magnitude and distribution of SAH with greater access and regular use of health services, especially when they reside in locations with greater access to health actions and services.

Although it is not possible to consider that hypertensives registered or not in the FHS had the same opportunities for diagnosis and control of SAH and recognition as a health problem, the findings indicated that, even when under worse individual and contextual socioeconomic conditions, hypertensive patients registered in the FHS have similar use of health services for adults with equal morbidity, but with more favorable living and health conditions.

This equality of use cannot be affirmed as a proxy for satisfactory monitoring of hypertension among the study groups. Studies show that health conditions are correlated with access to and use of health services and that the gradual increase in access to these services in Brazil in recent years is due to the public, private (publicly or privately financed) and supplementary health care²⁶. Thus, this equality of use of health services among hypertensive patients surveyed is due to the important expansion of the public service network in the

country, without necessarily having been accompanied by satisfactory quality standards of diagnosis and control. However, despite this set of limitations, this research indicated that, among hypertensive adults, FHS has an effect on the use of health services in Brazil.

CONCLUSION

The FHS has the potential to reduce the health effects of socioeconomic, demographic, individual health and contextual inequalities. The FHS can favor health care, and adequate control of chronic morbidity has a major influence on quality of life and well-being, reducing the risks of early death and lost years with disability. Therefore, the FHS should continue to receive investments that favor health promotion practices, control and maintenance of hypertension treatment. Such practices can make adult life years healthier in different parts of the country.

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