

ORIGINAL ARTICLE

<https://doi.org/10.61910/ricm.v9i1.540>

Evaluation of Adherence to Antihypertensive Drug Treatment in a Teaching Outpatient Clinic of Cardiology and Internal Medicine

WAGNER SCALABRINI NETO¹ , GUILHERME CASTELLO BRANCO DE SÁ¹ , FERNANDA BRITO DE OLIVEIRA¹ , CLARA SOUSA DINIZ¹ .

¹FACULTY OF MEDICAL SCIENCES OF MINAS GERAIS (FCMMG) – BELO HORIZONTE, MG, BRAZIL

CORRESPONDING AUTHOR: WAGNER SCALABRINI NETO – RUA PROFESSOR ANTONIO ALEIXO, 300 – LOURDES, BELO HORIZONTE – MG, BRAZIL (+55) 31 993656327

EMAIL: WAGNERCP2000@GMAIL.COM

HIGHLIGHTS

What is already known?

- Hypertension is a disease with a silent manifestation and long-term detrimental effects.
- Low adherence to antihypertensive treatment is associated with poorer outcomes.
- Complications related to uncontrolled blood pressure generate high healthcare costs

What has been shown?

- Assessment of adherence to antihypertensive treatment and factors influencing nonadherence.
- There are factors related to the patient, treatment, and healthcare services.
- Effective physician–patient communication is a key element for optimal medication adherence.

How can the study contribute to the literature?

- Public health measures aimed at improving therapeutic adherence among hypertensive patients.
- Understanding the costs of the disease enables estimation of its impact on healthcare.
- Encouraging the production of larger studies to further investigate the topic.

ABSTRACT

Introduction: Systemic Arterial Hypertension (SAH) is a condition characterized by the persistent elevation of blood pressure, which silently damages organs and is associated with cardiovascular complications. One of the causes of inadequate SAH control is low adherence to the proposed treatment, which negatively impacts patients' health and burdens the healthcare system with increased medication use and hospitalizations. **Objectives:** To evaluate adherence to antihypertensive medication treatment in patients from the Cardiology and Medical Clinic of a school clinic. **Methodology:** This is a descriptive cross-sectional quantitative study using the Morisky 8-Item Medication Adherence Scale to classify patients as having good, moderate, or low adherence. A second questionnaire was applied to patients with low adherence to understand the associated factors. **Results:** Of the 87 patients, 33 (38%) demonstrated good adherence, 32 (37%) showed moderate adherence, and 22 (25%) had low adherence. Among the individuals with low adherence, 77.5% reported poor socioeconomic conditions, and 64% had been living with hypertension for over 10 years. Regarding the treatment, 36% found it complicated, 41% reported side effects, and 23% cited high costs. Additionally, 45% had considered abandoning the treatment. Concerning the healthcare system, 68% found the facilities disorganized, 55% did not perceive educational initiatives, and 64% rated the doctor-patient relationship negatively. **Conclusion:** The study highlighted the characteristics of hypertensive patients' profiles from the school clinic and proposed measures to improve medication adherence in hypertensive patients.

Keywords: Hypertension; Cooperation and treatment adherence; Pharmacological treatment; SUS.

INTRODUCTION

Systemic Arterial Hypertension (SAH) is the leading modifiable risk factor for all causes of cardiovascular morbidity and global mortality.¹ In Brazil, its prevalence reaches 35% among individuals over 40 years of age.² Most patients present with essential or primary hypertension, in which the cause is not fully elucidated, whereas approximately 10% have the secondary form of the disease, in which an identifiable cause is present.¹ Its pathophysiology involves complex interactions among environmental, behavioral, genetic, and hormonal factors, as well as multiple systems, including the renal, cardiovascular, and central nervous systems.¹ The disease is characterized by a persistent elevation of blood pressure (BP), defined as systolic BP greater than or equal to 140 mmHg and/or diastolic BP greater than or equal to 90 mmHg.¹ To establish the diagnosis, it is recommended that elevated readings be confirmed by measurements taken outside the clinical setting or by another abnormal reading obtained during a subsequent visit.¹

Furthermore, the 2024 European Guidelines for the Management of Hypertension introduced a new concept termed "elevated blood pressure," defined as an ambulatory measurement of 120–139 mmHg systolic or 70–89 mmHg diastolic. However, this range is not yet considered high enough to warrant the prescription of antihypertensive drugs, and cardiovascular risk should therefore be stratified on an individual basis.¹

The treatment of SAH comprises both pharmacological and non-pharmacological measures, which are essential for reducing patient morbidity and mortality.³ These interventions are of utmost importance, as adequate blood pressure control directly reduces mortality from cardiovascular diseases (CVD), the progression to chronic kidney disease, and premature death.⁴ However, despite the efficacy and relevance of treatment, BP control remains suboptimal in most

countries, including Brazil.³ The primary reason for poor BP control appears to be non-adherence to the proposed therapeutic regimen, both regarding lifestyle modifications, which include physical activity, dietary adjustment, salt restriction, and pharmacological therapy.⁴

In addition to the individual consequences previously mentioned, SAH is associated with substantial health-care expenditures related to medication supply, hospital admissions, and high-complexity procedures. In Brazil, health expenditures related to CVD increased by 17% between 2010 and 2015, reaching 37.1 billion reais. These costs were associated with premature death, hospitalizations, and loss of productivity following disease onset.⁵

Given the high prevalence of SAH, its associated morbidity and mortality, the importance of treatment for achieving adequate disease control, and its financial impact on the Brazilian Unified Health System (SUS), it is essential to assess patient adherence to antihypertensive treatment and to understand the factors contributing to non-adherence. Such understanding may enable the development of potential public health interventions aimed at modifying this scenario.

Therefore, the present study aims to evaluate adherence to antihypertensive drug therapy using a specific assessment scale applied to patients followed at a teaching outpatient clinic, as well as to identify the main factors associated with non-adherence to the therapeutic regimen.

METHOD

Study design

This was a descriptive, quantitative, cross-sectional study conducted at a teaching outpatient clinic between October 2023 and September 2024. The study was approved by the Research Ethics Committee on August 29, 2023.

Sample

A total of 87 patients of both sexes, aged 18 years or older, and diagnosed with SAH were included in the study. The diagnosis was identified in the electronic medical records according to the International Classification of Diseases (ICD-10, code I10 – Essential (primary) hypertension), or by a self-reported history of hypertension at the first consultation, when the patient was already using antihypertensive medication. All participants were followed by the Internal Medicine and/or Cardiology services and provided written informed consent. The selection was carried out consecutively, according to the order of arrival at medical appointments. Patients with impaired decision-making capacity were excluded.

Data Collection and Procedures

Initially, to characterize the study sample, data on age and sex were collected. Subsequently, to assess adherence to antihypertensive drug therapy, the Eight-Item **Morisky Medication Adherence Scale (MMAS-8)**—a tool validated for Brazilian Portuguese—was applied.⁶ The study that validated the MMAS-8 demonstrated a significant association between higher scores and blood pressure control, with a sensitivity of 86.2% and specificity of 31.8% in the Brazilian population.⁶

The MMAS-8 consists of eight dichotomous (yes/no) questions, as follows:

1. “Do you sometimes forget to take your blood pressure medications?”
2. “In the past two weeks, was there any day when you did not take your blood pressure medications?”
3. “Have you ever stopped taking or reduced the dose of your medications without telling your doctor because you felt worse when taking them?”
4. “When you travel or leave home, do you sometimes forget to bring your medications?”

5. “Did you take your blood pressure medication yesterday?”
6. “When you feel that your blood pressure is under control, do you sometimes stop taking your medication?”
7. “Have you ever felt bothered by following your treatment plan for high blood pressure correctly?”
8. “How often do you have difficulty remembering all your blood pressure medications?”

The degree of adherence is determined by summing all correct responses: **high adherence (8 points)**, **medium adherence (6 to <8 points)**, and **low adherence (<6 points)**.⁶

For patients who scored below six points on the MMAS-8, a questionnaire developed by the authors—based on previous literature—was applied to identify reasons for non-adherence. This instrument was termed the **Non-Adherence Reasons Questionnaire (NARQ)**.⁷ The following aspects were evaluated:

- “How would you describe your socioeconomic condition?”
- “For approximately how long have you lived with hypertension?”
- “Does hypertension cause you any symptoms?”
- “Do you feel you are cured of the disease?”
- “Do you think your treatment is complex?”
- “Do you think your treatment causes side effects?”
- “Do you think your treatment is expensive?”
- “Have you ever stopped or wanted to stop your treatment?”

- “Do you think your healthcare center is well organized?”
- “Does your healthcare center implement initiatives to educate the population about diseases such as hypertension?”
- “How would you describe the doctor–patient communication at your healthcare center?”

Statistical Analysis

The data obtained for sample characterization, as well as responses to the MMAS-8 and NARQ questionnaires, were organized in an Excel spreadsheet and subjected to detailed analysis. Simple and percentage frequencies were calculated to present the results clearly and objectively.

RESULTS

The diagram presents the flowchart of patient selection for inclusion in the study (Figure 1).

Table 1 details the sociodemographic characteristics of the study participants. Among the included patients (n = 87), 51 (59%) were women. The mean age observed was 63 years.

Table 2 presents the results obtained from the application of the MMAS-8 scale. It was observed that most patients demonstrated good (33; 38%) or moderate (32; 37%) adherence to treatment, while a smaller proportion (22; 25%) was classified as having low adherence.

Table 3 displays the results obtained from the Non-Adherence Reasons Questionnaire (NARQ), which was applied to the 22 patients who scored fewer than six points on the MMAS-8 and were therefore considered non-adherent. The NARQ allowed the identification of causes of poor adherence related to the patient, anti-hypertensive treatment, and healthcare services.

Regarding patient-related factors, 17 (78%) reported their socioeconomic condition as fair to poor. Concerning treatment-related factors, 9 (41%) reported experiencing side effects, and 10 (45%) stated that they had considered discontinuing therapy. Finally, in relation to the healthcare system, 15 patients (68%) considered their health units to be disorganized.

DISCUSSION

Research aimed at identifying the prevalence of adherence to hypertension treatment is essential for guiding both individual and collective health care interventions.⁸ The study sample consisted predominantly of women, with a mean age of 61 years. Most individuals demonstrated moderate to good adherence to treatment. Among those with low adherence, regular to poor socioeconomic status and longer disease duration were the factors most strongly associated with poorer adherence. Socioeconomic conditions influence adherence in several ways, as they are associated with access to information, medications, and the quality of health services. Furthermore, there are established explanations for the association between low socioeconomic status and hypertension, including psychosocial stress, dietary differences, and acceptance or rejection of medical care.⁹

Within the study population, only one participant described his social condition as poor, also reporting in the NARQ that their health center was disorganized, lacked educational initiatives regarding chronic diseases such as hypertension, and exhibited poor doctor-patient communication. These factors contribute to poor adherence, as they lead to a limited understanding of the illness process by the patient. Social determinants such as education, income, social status, and employment may also play an important role in the pathogenesis of hypertension.¹⁰

In addition to socioeconomic status, another factor that may be associated with poor adherence is patients' forgetfulness regarding medication intake. In our sample, 18 (82%) individuals in the "Low Adherence" group reported forgetting to take their medication. Ghai et al. conducted a study in California that sought to identify barriers and facilitators of adherence to antihypertensive therapy, identifying forgetfulness as one of the main factors contributing to non-adherence.¹¹ To address this, the study implemented a five-month intervention consisting of text message reminders to encourage medication use. As a result, 75% of participants agreed that receiving text reminders helped them develop the habit of taking their medication, particularly those most prone to forgetting. Other important barriers identified included medication side effects (41% of patients in the "Low Adherence" group reported adverse effects) and changes in routine, especially travel (55% of the "Low Adherence" group reported forgetting their medication when traveling or leaving home). Facilitating factors described included a stable routine, motivation (such as trust in one's physician), and planning.¹¹

Evidence indicates that hypertension contributes to reduced quality of life compared with normotensive individuals, though treatment can improve this parameter.² A systematic review and meta-analysis explored this association, evaluating health-related quality of life (HRQOL) in relation to both pharmacological and non-pharmacological adherence.² The main finding was that non-pharmacological treatment improved overall quality of life (by 2.45 points) and the physical domain, while medication adherence positively impacted both the mental and physical domains, as well as overall HRQOL (by 9.24 points). Thus, adequate treatment is associated with improved well-being, likely due to the reduction of complications and hospitalizations related to hypertension.

An exploratory cross-sectional study conducted in Londrina, Paraná, assessed both pharmacological and non-pharmacological adherence among hypertensive patients.⁸ Participants were classified as “non-adherent,” “partially adherent,” or “fully adherent” according to criteria established by the authors. In addition to adherence, reasons for partial or total non-adherence were identified, as well as variables such as socioeconomic condition and opinions regarding primary healthcare team performance—factors also analyzed in the present study. In contrast to our findings, 66.8% of participants in the study by Giroto et al. rated their primary healthcare units as good or excellent, whereas in our analysis, 15 (68%) patients reported disorganization in their health centers. Moreover, in the Londrina study, 9% were classified as non-adherent, 32% as partially adherent, and 59% as adherent. In our evaluation, the results were more evenly distributed: 22 (25%) patients in the “low adherence” group, 33 (38%) in “good adherence,” and 32 (37%) in “moderate adherence.” Although this discrepancy may be multifactorial, it underscores the importance of the doctor–patient relationship and the role of primary care in promoting adherence. Proper understanding of the disease and its natural course is a key element in persuading patients to use their medication correctly and attend medical follow-ups regularly.^{12, 13}

Another relevant finding was that 13 (59%) patients with poor adherence reported symptoms related to hypertension. The literature indicates that chronic symptoms may paradoxically impair adherence, as patients may associate medication use with adverse effects or perceived treatment ineffectiveness.¹⁴ Moreover, even in cases of resistant or refractory hypertension—where symptoms and complications are more pronounced—non-adherence rates remain high; studies involving patients on multiple antihypertensive agents have shown that only about 40% were fully adherent.^{15, 16}

Finally, this study identified not only the prevalence of non-adherence to antihypertensive treatment among patients in a public outpatient clinic within the SUS, but also the main factors leading patients to neglect treatment. Such findings are highly relevant for health planning, as effective interventions occur when healthcare professionals’ actions are informed by community-specific needs.

Study Limitations

All information collected was self-reported and, therefore, subject to recall and reporting bias, which may have led to underestimation or overestimation of the results. In addition, the study sample was small and composed of patients from a single public healthcare facility within the SUS. This population was predominantly low-income; thus, other factors may also contribute to poor blood pressure control and low medication adherence, such as increased stress, inadequate and/or insufficient nutrition, and precarious living conditions—social determinants that were not addressed in this study. Furthermore, blood pressure measurements obtained during the participants’ consultations were not recorded for correlation with adherence. Having such data would have made it possible to determine whether patients with good adherence exhibited better blood pressure control than those with low adherence. Finally, the study’s external validity is limited due to the small sample size, which prevents generalization of the findings to the broader population.

CONCLUSION

The study findings indicate that although most patients demonstrated good to moderate adherence to antihypertensive treatment, one quarter of the sample exhibited low adherence. Among non-adherent patients, factors related to socioeconomic conditions, treatment side effects, and negative perceptions regarding the organization of the healthcare service were identified as the main contributors to poor adherence.

Given that these determinants are already well known, future studies should aim to identify strategies to overcome such barriers to improve medication adherence, achieve better blood pressure control, and consequently reduce morbidity, mortality, hospitalizations, and healthcare costs.

REFERENCES

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. *European Heart Journal*. 2024;45(38):3912-4018. doi:10.1093/eurheartj/ehae178
2. Souza ACC de, Borges JWP, Moreira TMM. Quality of life and treatment adherence in hypertensive patients: systematic review with meta-analysis. *Revista de Saúde Pública*. 2016;50(0). doi:10.1590/s1518-8787.2016050006415
3. Geldsetzer P, Manne-Goehler J, Marcus ME, et al. The state of hypertension care in 44 low-income and middle-income countries: a cross-sectional study of nationally representative individual-level data from 1.1 million adults. *The Lancet*. 2019;394(10199):652-662. doi:10.1016/S0140-6736(19)30955-9
4. Barroso WKS, Rodrigues CIS, Bortolotto LA, et al. Diretrizes Brasileiras de Hipertensão Arterial – 2020. *Arquivos Brasileiros de Cardiologia*. 2021;116(3):516-658. doi:10.36660/abc.20201238
5. Nilson EAF, Andrade R da CS, Brito DA de, Michele Lessa de O. Custos atribuíveis a obesidade, hipertensão e diabetes no Sistema Único de Saúde, Brasil, 2018. *Revista Panamericana de Salud Pública*. 2020;44:1. doi:10.26633/RPSP.2020.32
6. de Oliveira-Filho AD, Morisky DE, Neves SJF, Costa FA, de Lyra DP. The 8-item Morisky Medication Adherence Scale: Validation of a Brazilian–Portuguese version in hypertensive adults. *Research in Social and Administrative Pharmacy*. 2014;10(3):554-561. doi:10.1016/j.sapharm.2013.10.006
7. Lopes JHP, Oliveira AMG, Pereira AC, Meneghim MDC. Adesão do paciente à terapia medicamentosa da hipertensão arterial: revisão da literatura. *Revista de Odontologia da Universidade Cidade de São Paulo*. 2017;27(3):235. doi:10.26843/ro_unid.v27i3.254
8. Giroto E, Andrade SM de, Cabrera MAS, Matsuo T. Adesão ao tratamento farmacológico e não farmacológico e fatores associados na atenção primária da hipertensão arterial. *Ciência & Saúde Coletiva*. 2013;18(6):1763-1772. doi:10.1590/S1413-81232013000600027
9. Spritzer N. Epidemiologia da hipertensão arterial sistêmica. *Medicina (Ribeirão Preto Online)*. 1996;29(2/3):199-213. doi:10.11606/issn.2176-7262.v29i2/3p199-213
10. Grotto I, Huerta M, Sharabi Y. Hypertension and socioeconomic status. *Current Opinion in Cardiology*. 2008;23(4):335-339. doi:10.1097/HCO.0b013e3283021c70
11. Ghai I, Palimaru A, Ebinger JE, et al. Barriers and facilitators of habit building for long-term adherence to antihypertensive therapy among people with hypertensive disorders in Los Angeles, California: a qualitative study. *BMJ Open*. 2024;14(7):e079401. doi:10.1136/bmjopen-2023-079401
12. Santos MVR dos, Oliveira DC de, Arraes LB, Oliveira DAG, Medeiros L, Novaes M de A. Adesão ao tratamento anti-hipertensivo: conceitos, aferição e estratégias inovadoras de abordagem. *Rev Soc Bras Clin Méd*. Published online in 2013.
13. Giorgi, D. M. A. Estratégias para melhorar a adesão ao tratamento anti-hipertensivo. *Rev Bras Hipertens*, 13(1), 47-50. 2006.

14. Choudhry NK, Kronish IM, Vongpatanasin W, et al. Medication Adherence and Blood Pressure Control: A Scientific Statement From the American Heart Association. *Hypertension*. 2022;79(1):e1-e14. doi:10.1161/HYP.0000000000000203

15. Hamdidouche I, Gosse P, Cremer A, et al. Clinic Versus Ambulatory Blood Pressure in Resistant Hypertension: Impact of Antihypertensive Medication Nonadherence: A Post Hoc Analysis the DENERHTN Study. *Hypertension*. 2019;74(5):1096-1103. doi:10.1161/HYPERTENSIONAHA.119.13520

16. Siddiqui M, Judd EK, Dudenbostel T, et al. Antihypertensive Medication Adherence and Confirmation of True Refractory Hypertension. *Hypertension*. 2020;75(2):510-515. doi:10.1161/HYPERTENSIONAHA.119.14137

Figure 1. Flowchart of the selection of study patients

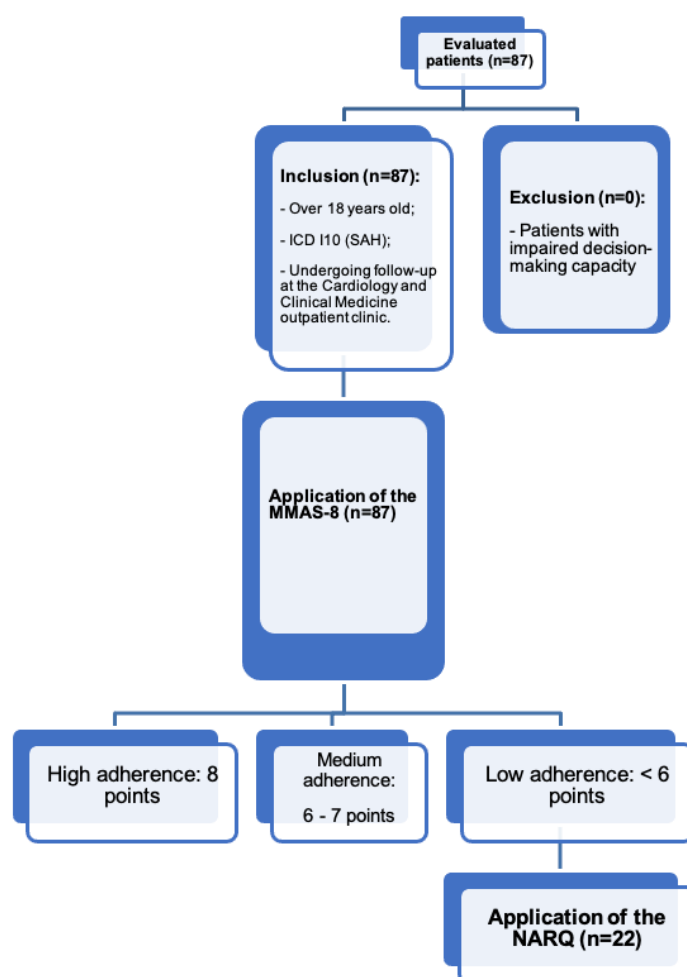


Table 1. Sample Characterization

Sociodemographic Data

Variable	Total Sample (N = 87)
Men	36 (41.37%)
Women	51 (58.62%)
Mean age	63 years (minimum 54; maximum 72)

Table 2. MMAS-8 Scale Analysis

Score (Morisky-Green Scale)

Score (Morisky-Green Scale)	n (%)
0	1 (1.1%)
1	1 (1.1%)
3	4 (4.6%)
4	8 (9.2%)
5	8 (9.2%)
6	11 (13%)
7	21 (24%)
8	33 (38%)

Adherence

Adherence	n (%)
Low	22 (25%)
Good	33 (38%)
Moderate	32 (37%)

MMAS-8 Questionnaire Responses

Question	Response	n (%)
Do you sometimes forget to take your blood pressure medications?	No	60 (69%)
	Yes	27 (31%)
In the past two weeks, was there any day you did not take your blood pressure medications?	No	68 (78%)
	Yes	19 (22%)
Have you ever stopped taking your medications or reduced the dose without informing your doctor because you felt worse when taking them?	No	72 (83%)
	Yes	15 (17%)
When you travel or leave home, do you sometimes forget to bring your medications?	No	72 (83%)
	Yes	15 (17%)
Did you take your blood pressure medication yesterday?	No	7 (8.0%)
	Yes	80 (92%)
When you feel that your blood pressure is under control, do you sometimes stop taking your medications?	No	83 (95%)
	Yes	4 (4.6%)
Have you ever felt bothered by following your blood pressure treatment correctly?	No	68 (78%)
	Yes	19 (22%)
How often do you find it difficult to remember all your blood pressure medications?	Sometimes	21 (24%)
	Frequently	7 (8.0%)
	Never	52 (60%)
	Almost never	7 (8.0%)

Table 3. Non-Adherence Reasons Questionnaire (NARQ)

(Based on the questionnaire developed by the authors, grounded in previous literature)

Characteristics	n (%)
How would you describe your socioeconomic condition?	
Good	5 (23%)
Fair	16 (73%)
Poor	1 (4.5%)
How long have you been living with hypertension?	
10 years or more	14 (64%)
Between 1 and 4 years	3 (14%)
Between 5 and 9 years	5 (23%)
Does hypertension cause you any symptoms?	
No	9 (41%)
Yes	13 (59%)
Do you feel that you are cured of the disease?	
No	20 (91%)
Yes	2 (9.1%)
Do you think your treatment is complex?	
No	14 (64%)
Yes	8 (36%)
Do you think your treatment causes side effects?	
No	13 (59%)
Yes	9 (41%)
Do you think your treatment is expensive?	
No	17 (77%)
Yes	5 (23%)
Have you ever stopped or wanted to stop your treatment?	
No	12 (55%)
Yes	10 (45%)
Do you think your healthcare center is well-organized?	
No	15 (68%)
Yes	7 (32%)
Does your healthcare center implement measures to educate the population about diseases such as hypertension?	
No	12 (55%)
Yes	10 (45%)
How would you describe doctor-patient communication at your healthcare center?	
Good	8 (36%)
Fair	7 (32%)
Poor	7 (32%)