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Original Article

Factors associated with non-adherence to medication in hypertensive patients: baseline assessment of the ESSENCE study

Fatores associados à não adesão medicamentosa de pacientes hipertensos: avaliação da linha de base do estudo ESSENCE

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ABSTRACT

Objective: to evaluate factors associated with therapeutic adherence among hypertensive patients treated at a community pharmacy. **Methods**: A descriptive secondary analysis of the baseline data from the ESSENCE study, which included hypertensive patients aged 30 to 69 years, followed up at a community pharmacy. Sociodemographic and clinical variables were evaluated as possible predictors of medication adherence. Adherence was measured using the Brief medication Questionnarie (BMQ), and the variables of interest were collected through interviews. **Results**: A total of 160 patients were evaluated, with 76.6% being female and an average age of 53 years (± 9.08). A 59.4% adherence rate to antihypertensive treatment was found. Among the variables evaluated as predictors, only the total number of medications used (p≤0.001) and the number of daily doses in the therapeutic regimen (p-value = 0.029) showed a statistically significant association. **Conclusion**: The findings highlight the need to develop strategies aimed at simplifying therapeutic regimens to promote medication adherence.
Keywords: Hypertension; Medication Adherence; Polypharmacy.

RESUMO

Objetivo: avaliar fatores associados à adesão medicamentosa de pacientes hipertensos atendidos em uma farmácia comunitária. **Métodos:** Análise secundária descritiva da linha de base do estudo ESSENCE, que incluiu pacientes hipertensos com idade entre 30 e 69 anos, acompanhados em uma farmácia comunitária. Variáveis sociodemográficas e clínicas foram avaliadas como possíveis preditoras de adesão medicamentosa. A adesão foi mensurada por meio do Brief medication Questionnaire BMQ e as variáveis de interesse foram coletadas por meio de entrevista. **Resultados:** Foram avaliados 160 pacientes, sendo 76,6% do sexo feminino e com média de idade de 53 anos (± 9,08). Foi encontrada uma taxa de adesão do tratamento anti-hipertensivo de 59,4%. Dentre as variáveis avaliadas como preditoras, apenas o número total de medicamentos utilizados (p≤0,001) e o número de doses diárias do esquema terapêutico (p=0,029) apresentaram associação estatisticamente significativa com a adesão. **Conclusão:** Os achados apontam para a necessidade de desenvolver estratégias que busquem simplificar os esquemas terapêuticos promovendo a adesão medicamentosa.
Palavras-chave: Hipertensão; Adesão à Medicação; Polimedicação.

Introduction

Arterial Hypertension (AH) is a chronic non-communicable disease (NCD) characterized by a persistent elevation of blood pressure (BP). In 2019, 32% of women and 34% of men aged 30 to 79 years were affected by hypertension worldwide.[1] The implementation of antihypertensive treatment through pharmacological and non-pharmacological measures aims primarily to reduce the morbidity and mortality associated with elevated BP values.[2]

Despite the proven effectiveness and efficacy of treatment, hypertension control rates remain unsatisfactory in most countries, including Brazil. The reasons for poor control among these individuals are multifactorial, with lack of treatment adherence being the main cause of inadequate BP control and, consequently, an increased risk of target-organ damage (TOD) and cardiovascular (CV) morbidity and mortality.[2,3]

According to the World Health Organization (WHO), adherence refers to the degree to which a person's behavior regarding treatment, such as taking medication, following a diet, or adopting lifestyle changes, corresponds to the recommendations agreed upon with a healthcare professional.[4] Medication adherence, also known as pharmacological adherence, specifically concerns compliance with the prescribed medication regimen.[5] It is a complex and multidimensional process influenced by several factors, including age, income, education, and ethnicity/race, which are particularly relevant in settings with a predominance of low socioeconomic status.[6]

Based on data from the National Survey on Access, Use, and Promotion of Rational Use of Medicines (PNAUM), a cross-sectional study, the prevalence of low adherence to pharmacological treatment for chronic diseases was found to be 30.8%.[7] A population-based cross-sectional study on home care for the elderly observed that about one-third of older adults who used medications had low adherence to treatment.[8] Another cross-sectional study involving 385 hypertensive individuals aged 20 to 79 years registered in a family health unit in a Brazilian municipality found that adherence to pharmacological treatment was 59%.[9] Additionally, a population-based study indicated that approximately 17% of individuals reporting a diagnosis of hypertension were not using continuous medications.[10]

Barriers to optimal adherence may be related to healthcare professionals' attitudes, patients' beliefs and behaviors, the complexity and tolerability of pharmacological therapies, the healthcare system, and several other factors. Non-adherence to medications may also be associated with patient-specific obstacles, such as depression, comorbidities, low health literacy, medication cost and concerns, forgetfulness, and lack of motivation for self-care.[11]

Objectives

This study aimed to evaluate the factors associated with medication non-adherence among hypertensive patients attending a community pharmacy in a municipality in the state of Bahia, Brazil.

Methodology

The patients included in the study met the following criteria: (1) age between 30 and 69 years; (2) confirmed medical diagnosis of arterial hypertension (self-reported, based on a medical report or prescription); (3) ambulatory use only of antihypertensive medications listed in the Municipal List of Essential Medicines (REMUME) of the municipality of Vitória da Conquista; (4) possession of a mobile phone capable of receiving text messages through Short Message Service (SMS); and (5) ability to access and read text messages on their mobile phone.

The following patients were excluded: (1) elderly individuals unable to receive SMS due to cognitive impairments; (2) patients unable to receive SMS due to visual, auditory, or mental disabilities, assessed through self-report; (3) pregnant women or those with recent childbirth (up to 3 months), as assessed by self-report; (4) breastfeeding women,

as assessed by self-report; and (5) frail elderly patients considered unable to use their medications independently.

During the consultations conducted at the pharmacy, hypertensive patients using only REMUME-listed medications were invited by trained pharmacists and pharmacy students to attend one of the consultation rooms, where they received verbal and written information about the study. Those who agreed to participate were provided with details contained in the Informed Consent Form (ICF), which was subsequently signed in duplicate, with one copy provided to the participant.

The variables of interest were: (1) sociodemographic data; (2) habits and behaviors; (3) data related to the disease and medication treatment; and (4) adherence measurement performed using the Brief Medication Questionnaire (BMQ). Data collection related to patient identification, sociodemographic profile, and habits and behaviors was based on documents presented by the patient or self-reported information.

The Brief Medication Questionnaire (BMQ) consists of three domains with questions that identify barriers to adherence regarding regimen, beliefs, and recall in relation to medication treatment from the patient's perspective. The first part of the questionnaire includes five items that measure adherence behavior and is called Regimen. The second part involves questions about the patient's concerns or doubts regarding the effectiveness of a specific medication, concerns about undesirable side effects, short- or long-term risks, or other bothersome characteristics of a given medication, and is called Belief. The third and final part is called Recall and includes items that measure potential problems in remembering all doses. These barriers are identified by reviewing the dosage regimen.

The results of possible variables considered predictors of medication adherence were analyzed: sex, self-reported ethnicity, alcohol consumption, smoking, marital status, educational level, total number of medications, and number of daily doses , the latter defined as the number of dosage units administered within a 24-hour period.

For analytical purposes, the BMQ results were dichotomized, and patients were classified into two groups: those who scored from zero to one point across the three domains were classified as adherent, and those who scored two or more points were classified as non-adherent. Statistical analysis was performed using the chi-square test and descriptive statistics with the Jamovi 2.2.5 software. A p-value < 0.05 was considered statistically significant.

The research was conducted in accordance with Resolution No. 466/2012 of the National Health Council, which approves the guidelines and regulatory standards for research involving human subjects. The project was approved by the Research Ethics Committee of the Multidisciplinary Health Institute of the Federal University of Bahia (Opinion number: 3.283.725). Individuals who agreed to participate in the research were informed about the risks involved and were asked to sign the Informed Consent Form (ICF).

Results

A total of 160 patients were evaluated, of whom 76.6% were female, with a mean age of 53 years (± 9.08). Among these patients, the majority self-identified as mixed-race (55%), had no partner (54.4%), and had incomplete elementary education (55.6%). Most reported not consuming alcoholic beverages (63.7%) and not using tobacco (90.6%).

Prescription analysis showed a mean number of medications in use of 2.74 (± 1.31) and a mean number of daily doses of 3.59 (± 1.74). Regarding adherence assessed by the Brief Medication Questionnaire (BMQ), 59.4% of patients demonstrated adherence to antihypertensive treatment (Table 1).

Regarding the variables considered predictors of medication adherence, a statistically significant association was observed for the total number of medications used ($p \leq 0.001$) and for the number of daily doses in the therapeutic regimen ($p = 0.029$), as detailed in Table 2.

Table 1. Sociodemographic and clinical factors of patients

	Mean (Standard Deviation)	N (%)
Age	53 (± 9.08)	
Sex		
Male		39 (24.4%)
Female		121 (76.6%)
Race/Ethnicity		
White		30 (18.8%
Black		42 (26.3%)
Mixed		88 (55%)
Has a partner		
Yes		73 (45.6%)
No		87 (54.4%)
Education level		
Incomplete elementary school		89 (55.6%)
Complete elementary school		71 (44.4%)
Alcohol consumption		
Yes		58 (36.2%)
No		102 (63.7%)
Smoking		
Yes		15 (9.4%)
No		145 (90.6%)
Total number of medications used	2.74(±1.31)	
Number of daily doses	3.59(±1.74)	
Time since diagnosis		
Less than 1 year		13 (8.1%)
1-2 years		12 (7.5)
2-4 years		31 (19.4%)
5 or more years		104 (65%)
No other comorbidities		85 (53.1%)
Other comorbidities		75 (46.9%)
Diabetes		42 (26.2%)
Dyslipidemia		28 (17.5%)
Heart failure		1 (0.62%)
Endocrine dysfunction		3 (1.25)
Overweight/obesity		1 (0.62%)
Others		14 (8.75%)
Adherence		
Adherent		95 (59.4%)
Non-Adherent		65 (40.6%)

Discussion

Upon analysis, it was observed that approximately 40.6% of patients exhibited non-adherence to treatment. This prevalence aligns with the findings of Girotto et al.[9], who studied 385 hypertensive patients aged 20 to 79 years and reported 41% non-adherence to pharmacological treatment.

Among the evaluated patients, women were found to be more adherent (61.2% of 121 women) to treatment than men; however, no statistically significant association was found for this variable. The relationship between sex and medication adherence is often discussed in the literature, where many findings indicate such an association. Jankowska-Polańska et al.[13] observed a significant relationship ($p = 0.024$) between adherence and female sex, with greater adherence among women.

Some studies have shown that marital status may influence health care. Individuals living with a partner or receiving family support tend to demonstrate higher medication adherence.[14] In comparison, in this study, having or not having a partner did not show a statistically significant association with adherence , a finding also reported by Mata et al.[15]

Regarding lifestyle factors, patients who did not consume alcohol were more adherent to antihypertensive treatment than those who did, though the result was not statistically significant. This contrasts with Girotto et al.[9], who found a significant relationship ($p = 0.001$) between alcohol intake and adherence. Concerning smoking, no significant association was found in the present study, differing again from Girotto et al., who reported statistical significance for this variable ($p = 0.05$).

As previously noted, disease-related and treatment-related factors can influence non-adherence. In this study, the duration of hypertension diagnosis showed no significant association. However, Adidja et al.[16] found that high non-adherence rates were associated with a short duration of treatment (2-4 years), suggesting that adherence tends to improve over time as treatment continues.

Although comorbidities did not show a significant association with non-adherence in this study, such conditions can affect treatment, as patients with other diseases (e.g., diabetes mellitus, heart failure, dyslipidemia) often use multiple medications. Iancu et al.[17] concluded that treatment complexity negatively influences adherence, with 82.17% of participants reporting that following therapy would be easier if they took only one pill instead of two or more. Similarly, a cross-sectional study conducted in Rio Grande do Sul showed that the greater the number of antihypertensive drugs, the lower the adherence,[6] and Tavares et al.[8] identified polypharmacy as a strong predictor of poor adherence among older adults. These findings are consistent with the present study.

Table 2. Association of adherence with other variables

	Adherent	Non-Adherent	p-value
Age			0.192
Sex			0.599
Male	22 (56.4%)	17 (43.6%)	
Female	74 (61.2%)	47 (38.8%)	
Race/Ethnicity			0.264
White	19 (63.3%)	11 (36.7%)	
Black	29 (69%)	13 (31%)	
Mixed	48 (54.5%)	40 (45.5%)	
Has a partner			0.795
Yes	43 (58.9%)	30 (41.1%)	
No	53 (61%)	34 (39%)	
Education level			0.897
Incomplete elementary school	53 (59.5%)	36 (40.5%)	
Complete elementary school	43 (60.6%)	28 (39.4%)	
Alcohol consumption			0.074
Yes	33 (56%)	25 (43%)	
No	63 (61.8%)	39 (38.2%)	
Smoking			
Yes	9 (60%)	6 (40%)	
No	87 (60%)	58 (40%)	
Total number of medications used			0.001
Number of daily doses			0.029
Time since diagnosis			0.81
Less than 1 year			
1-2 years			
2-4 years			
5 or more years			
Other comorbidities			0.746
No	52 (61.2%)	33 (38.8%)	
Yes	44 (58.7%)	31 (41.3%)	

Source: Prepared by the authors

Patients on complex therapeutic regimens, that is, those taking multiple medications, are more prone to forget doses or discontinue treatment voluntarily, resulting in suboptimal adherence and potentially adverse health outcomes. Therefore, it is essential to design treatment regimens suited to the patient's clinical condition, favoring posological convenience (e.g., once-daily dosing or fixed-dose combinations of two or three antihypertensives), while minimizing adverse effects and polypharmacy.

This study has certain limitations, including the use of self-reported data to assess adherence, which may be affected by recall bias and provides information limited to the previous week of treatment. Combining the BMQ with a direct measurement method could yield more objective clinical data. Furthermore, the lack of consensus on the ideal method for evaluating adherence and the heterogeneity of assessment tools used in the literature make comparisons between studies challenging.[18]

Conclusions

This study identified that therapeutic regimen complexity, expressed by the total number of medications used and the number of daily doses, is a factor significantly associated with non-adherence to medication among hypertensive patients followed in a community pharmacy. Other sociodemographic and behavioral variables did not show a statistical-

ly significant association with adherence, although some findings are consistent with the literature and may indicate relevant trends.

These findings reinforce the importance of strategies aimed at simplifying therapeutic regimens as a means of promoting better adherence to treatment, thereby contributing to the effective control of hypertension and the reduction of associated morbidity and mortality. Furthermore, the study highlights the need for individualized interventions, combined with educational approaches and continuous follow-up within primary health care.

Authors' Contributions
EC, PC, MGO: Project design; EC, PM, KA, PB: Data collection; EC: Data analysis and manuscript writing; PB: Data curation; PC: Planning and randomization; PC, PM, KA, PB, MGO: Manuscript review; MGO: Administration and financial resource management.

Conflicts of Interest
The authors declare no financial or personal conflicts of interest.

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Data Availability Statement
The datasets generated and analyzed during the current study are available upon reasonable request to the corresponding author.

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