

Prevalence of non-adherence to antihypertensive pharmacotherapy and associated factors

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ABSTRACT

Objective: the aim of the study was to determine the prevalence of non-adherence to antihypertensive drug treatment and its association with factors bio-socio-economic and welfare. **Method:** it was a descriptive, cross-sectional study, performed with 422 hypertensive individuals. Data were collected through home interviews, conducted between December 2011 and March 2012. **Results:** the results showed that the respondents were mostly female, married, elderly, low income and little time of diagnosis. Were considered non adherent to medication 42.65% of participants. Non-Caucasian hypertensive patients, with fewer than eight years of schooling, who did not regularly attend doctor's appointments, took more than two anti-hypertensive medications and did not have private health insurance, showed higher likelihood of not complying with the drug treatment. **Conclusion:** these findings suggest that hypertensive patients with unfavorable socioeconomic characteristics and difficulty of access to the service require different interventions in order to encourage them to adhere to medication treatment. **Key words:** Hypertension; Medication Adherence; Health Profile; Primary Health Care; Nursing.

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INTRODUCTION

The increased life expectancy of the Brazilian population is due, among other factors, to the changes in economic, political and health aspects, these changes caused transformations on incidence and prevalence of diseases and major causes of death⁽¹⁾. Among Chronic Disease (CD), which has changed health indicators the most in recent decades, we highlight the Systemic Hypertension (SH) as an important public health problem in developed and developing countries, which is responsible for a large number of deaths around the world⁽²⁾.

Systemic Hypertension is considered one of the main risk factors for the development of renal complications, cardiac and cerebrovascular diseases, strongly impacting social security, due to its high medical and socioeconomic costs, especially of the complications that accompany it⁽³⁾.

To illustrate the magnitude of systemic hypertension in our country, we can observe that the state of Parana had the highest rate of hospitalization (43 per 10,000 inhabitants in 2011), the second highest mortality rate (14.79 per 10,000 inhabitants in 2010) and the average costs with hospitalization were higher for cardiac and cerebrovascular diseases in the South of Brazil⁽⁴⁾. Therefore, in order to reduce these traumatic events for the individual and his/her family, consequently the costs of treatment in more complex levels of care, clinical studies have shown that early detection, treatment and control of SH are extremely important⁽³⁾.

It is noteworthy that the emergence of the disease aggravation is closely associated with poor blood pressure control and this has a direct relationship with poor adherence to treatment⁽⁵⁾. Non-adherence is classically considered a complex and multidimensional phenomenon that prevents the achievement of therapeutic goals and may be a source of frustration for health professionals⁽⁶⁾. Estimates indicate that the degree of non-adherence to the global CD treatment ranges from 30% to 50%, being more evident in pharmacotherapy⁽⁷⁾.

As triggers of non-adherence to pharmacotherapy, epidemiological studies suggest several factors, especially socioeconomic ones such as: low income and low education⁽⁶⁾ and care factors such as: the number of medications consumed and failure to visit the doctor and group activities⁽⁷⁾.

Because non-adherence is a multidimensional behavior, it is necessary to investigate the factors that directly influence this process and the nurse, as a key element in the care of the person with hypertension in primary care, they must (re)learn their characteristics, potentialities, difficulties and real needs, so from them, prepare and implement intervention strategies that favor a greater degree of adherence to treatment and the subsequent control of blood pressure. Therefore, this study aimed to: 1) determine the prevalence of non-adherence of anti-hypertensive pharmacotherapy and 2) verify the association of non-adherence with bio-socio-economic and care factors.

METHODS

Descriptive cross-sectional study conducted with SH individuals in a city in southern Brazil, with a population of

approximately 357,000 inhabitants, assisted in primary care by 25 Basic Health Units (BHU). In order to conduct this research, we used the enrolled area of 23 BHU located in the urban area of the municipality.

The sample size was calculated based on the total number of people with hypertension registered in the city (40.073), considering a percentage of 50% that could present the characteristic of interest (non-adherence)⁽⁷⁾, with estimation error of 5% and 95% confidence interval, plus another 10% for possible losses, resulting in a sample of 422 individuals, randomly selected and stratified, with proportional distribution among people with hypertension registered in each BHU.

The inclusion criteria for the study were: 18 years old or older and in drug treatment for at least one year. Exclusion criteria were: patients with contraindication of anti-hypertensive therapy (two cases) and psychiatric diagnosis of mental disorder in the acute phase (fifteen cases). These people, due to the characteristics of the disease itself, tend not to adhere to therapy, since they almost always rely on other people for the correct continuous use of medications.

For data collection, firstly, we obtained, from the Municipal Health Secretariat, a list of all BHU with registration data of hypertensive individuals (name, date of birth and mother's name), all identified individuals received a number. Through an electronic draw, we determined those to be interviewed.

Then, in the BHU a listing of the addresses and phone numbers of selected individuals were organized, then proceeded to data collection, conducted during the months of December 2011 to March 2012, by analysis of medical records at BHU and semi-structured interviews were conducted at home with the application of a questionnaire with personal, socioeconomic and monitoring of health profile. In cases in which the selected individuals did not meet the inclusion criteria or refused to participate in the study, automatically, the next number on the list was invited to participate in the study, repeating this criterion up to three times.

To measure non-adherence to pharmacotherapy, we used an indirect assessment tool entitled *Questionário de Não Adesão de Medicamentos da Equipe Qualiaids (QAM-Q)* or Questionnaire of non-adherence to Medicines of the Qualiaids Team (QAM-Q), which was developed to address the act (if the participant takes any kind of medications and how much they take), the process (how does he/she takes medication in seven days) and the result of adherence - in this case if their BP was controlled. The questionnaire is validated⁽⁸⁾.

The instrument consists of three questions based on the last seven days: 1) On which days of the week didn't you take any of your medicines or on which days of the week did you take at least one extra pill of this medicine?; 2) In these days, how many pills did you fail to take or have taken in excess?; 3) How was your blood pressure the last time you measured? Note that for each antihypertensive medication the first two questions were asked to check how the individual takes each of his/her medications.

The responses resulted in a composite measure, in which individuals were considered adherent only when reported having taken 80% to 120% of the prescribed dose. These

values are obtained by multiplying the number of pills by the number of times consumed divided by the number of prescribed pills, multiplied by the number of times. Finally, the result is multiplied by one hundred.

Adherence was still subject to the proper consumption, that is, without "holidays" (not taking any medicines for a day); "Switching time" (take the correct dose, but at the wrong times); "Exchanging dose" (to increase or decrease the amount of the drug or drugs); "Taking it irregularly" (stop taking drugs at various days and times); "Half adherence" (taking a medication correctly and the other incorrectly); "Partial non-adherence" (stop taking one or more of his/her medicines); "Non-adherence" (do not take a dose of all medicines in the last seven days) and report that BP was normal in the last measurement (clinical outcome).

We chose to use the QAM-Q because it is a comprehensive tool that includes three different dimensions regarding adherence (taken dose, behavior regarding medication and clinical outcome), it has the same effectiveness of the concomitant use of other instruments and enable faster and easier application⁽⁸⁾.

Data were entered into a spreadsheet in Excel for Windows 2007[®] and analysed in the software Statistical Analysis System - SAS[®]. The variables of interest were dichotomized and after that, a descriptive analysis of the data was performed, which originated frequency tables presented as absolute and relative frequencies. To verify the relationship of the variables under study with the outcome of interest and its measure of association, a statistical analyses were used through the nonparametric Pearson chi-square test, with significance level of $p < 0.05$ and relative risk (RR).

The study was conducted in accordance with the guiding principle proposed by Resolution 196/96 of the National

Council of the Brazilian Ministry of Health. The project was approved by the Continuous Training Center on Health of Maringa Health Secretariat and approved by the Research Ethics Committee of the State University of Maringa (Protocol 631/2011). The right to participate freely and anonymously were guaranteed to participants, through signing the Consent Form in two copies.

RESULTS

Based on the combined measure of QAM-Q, 180 individuals with hypertension were considered non-adherent to pharmacotherapy, representing a prevalence of non-adherence of 42.65%.

The subjects studied were characterized as predominantly: females (59.48%), married (68.96%), with low family income (82.94%), presence of comorbidities (61.14%) and short time of diagnosis (56.16%). The mean age was maintained in the sixth decade of life (63.25%), and none of these statistical characteristics were significant for the outcome of interest ($p < 0.05$) (Table 1).

More specifically, although there is a trend observed for the non-adherence to pharmacological treatment of men compared to women and individuals without a partner, compared to those who were in a stable relationship, there was no statistically significant differences between the two groups ($p = 0.06$) and ($p = 0.12$).

With regard to skin color, it was observed that most participants were white (70.14%), of which 181 (42.89%) were considered adherent to pharmacotherapy. In turn, among non-whites, non-adherence was more frequent (15:41%), noting a statistically significant difference between the two

Table 01 - Distribution of socioeconomic characteristics and monitoring of a population health of adherent and non-anti-adherent hypertensive pharmacotherapy, Maringa-PR, 2012

Characteristics	Adherence				Total		RR** (IC***)	p
	No (180)		Yes (242)		n	%		
	n	%	n	%				
Gender								
Female	98	23.22	153	36.26	251	59.48		0.06
Male	82	19.43	89	21.09	171	40.52	—	
Age								
< 60 years	67	15.99	87	20.76	154	36.76		0.74
≥ 60 years	111	26.49	154	36.75	265	63.25	—	
Skin color								
White	115	27.25	181	42.89	296	70.14	1.3 (1.06 – 1.67)	0.01*
Not white	65	15.41	61	14.45	126	29.86		
Marital status								
With partner	117	27.73	174	41.23	291	68.96		0.12
Without partner	63	14.93	68	16.12	131	31.04	—	

Continua

Table 01 (cont.)

Characteristics	Adherence				Total		RR** (IC***)	p
	No (180)		Yes (242)		n	%		
	n	%	n	%				
Education								
≤ 08 years	126	29.86	142	33.65	268	63.51	1.3 (1.05 – 1.71)	0.01*
> 08 years	54	12.79	100	23.70	154	36.49		
Family income								
≤ 03 MW****	149	35.31	201	47.63	350	82.94	—	0.88
> 03 MW	30	7.10	42	9.96	72	17.06		
Co-morbidities								
Yes	108	25.60	150	35.54	258	61.14	—	0.67
No	72	17.06	92	21.80	164	38.86		
Time of diagnosis								
≤ 10 years	102	24.17	135	31.99	234	56.16	—	0.85
> 10 years	78	18.49	107	25.35	185	43.84		
Doctor's visit								
Yes	148	35.07	227	53.80	375	88.87	1.7 (1.3 – 2.3)	<0.01*
No	32	7.58	15	3.55	47	11.13		
Number of medications								
≤ 02	138	32.70	214	50.71	352	83.41	1.2 (1.06 – 1.26)	<0.01*
> 02	42	9.96	28	6.63	70	16.59		
Private health insurance								
Yes	60	14.45	105	24.64	165	39.09	1.3 (1.02 – 1.62)	0.03*
No	120	28.20	137	32.71	257	60.91		

*p-value significant for Pearson Chi-square; RR**: Relative risk; CI***: Confidence Interval; MW****: Minimum wage¹ in Parana State (\approx R\$736,00 during the period of research).

groups ($p=0.01$). The relative risk (RR) of the non-white SH individuals had 1.3 times greater chances of not adhering to pharmacotherapy.

With regard to education, we found that most participants had low educational levels (63.51%) and non-adherence to pharmacotherapy was significantly more common among them ($p=0.01$). The RR for individuals with hypertension who had eight years or less of education, they had 1.3 times greater chance of not adhering to pharmacotherapy.

The presence of chronic co-morbidities was found in 258 (61.14%) participants, the most common were: Diabetes mellitus (39.92%), inflammatory rheumatic diseases (23:25%), hypercholesterolemia (16:27%), heart disease (9.68%) and cancer (4.26%). However, the presence of comorbidities was not statistically associated with non-adherence.

On the other hand, regarding health monitoring characteristics, we can observe that individuals with hypertension who reported not frequently going to doctors' appointment ($p < 0.01$), using more than two different medications for blood pressure control ($p < 0.01$) and having no private health

insurance ($p = 0.03$) were respectively 1.7; 1.2 and 1.3 times more likely to non-adherence to the anti-hypertensive drug treatment.

DISCUSSION

The findings of this study showed important aspects of the characteristics of individuals with hypertension that should be considered in the analysis of non-adherence. Quantifying adherence/non-adherence with pharmacotherapy is not an easy task, due to bio-socio-economic factors and care characteristics, which have indispensable role during the study population with CD, including SH, as they have great influence following the treatment regimen^(5,9).

The prevalence of non-adherence to drug treatment identified in this study (42.65%) was lower than that found in a study conducted in a Brazilian city also in the South. Using the same instrument (QAM-Q), they found non-adherence prevalence of 53.1%⁽⁶⁾. However, it was higher than that found in national publications⁽¹⁰⁻¹¹⁾ and international⁽¹²⁾ which used

1 The minimum wage per month in Brazil corresponds to R\$ 788,00 reais or U\$ 260,06 dollars according to the Central Bank of Brazil on March 7th, 2015.

other methods for the identification of non-adherence, which is around 30%.

The number of women interviewed in this study (59.48%) can be considered high. However, the same situation was observed in other studies related to the topic^(1,5,9,13-15). This occurred, since women have better survival rates than men and therefore are more prone to CD for a longer period of time. When they are aged over 60 years, they generally have greater perception of disease and tendency to self-care, thus increasing the likelihood of hypertension diagnosis⁽¹⁴⁾.

Although there were no statistically significant differences between gender for non-adherence, historically, men have greater ignorance about the disease and its treatment⁽¹⁶⁾, while many women, being retired, housewives or being inserted in the informal labor market, have greater flexibility of time to seek care for their health problems, during the opening hours of BHU. Furthermore, women seem to have more accurate perception of their health condition and develop greater bonds with health services, primarily because these units are usually better prepared to assist them rather than men and, secondly, due to the very attributes and reproductive functions of women^(5,9,15), which certainly impacts in greater pharmacological adherence to treatment of CD⁽¹⁶⁾.

Another characteristic shown in the study population was the fact that most of the participants fall in the age group above the sixth decade of life (63.25%). This is due, among other factors, to the increased prevalence of CD in individuals above the age of fifty. In addition, one should consider the Brazilian aging population, which is increasing.

Despite the lack of statistical evidence on the age difference of adherent and non-adherent hypertensive individuals, studies show that non-adherence is more common among younger people, since they possibly have less time to wait for health service and have greater difficulty in recognizing the need for medical care^(6,17).

Similarly, a literature review study showed that older individuals are more likely to adhere to intervention, because there was a greater reduction in diastolic BP in older people. Also, while 17.1% of younger subjects took antihypertensive treatment, that number increased to 77.4% among people over 45 years. This is because the young do not feel vulnerable to the disease, while the older, more concerned about their health, comply to treatment as an alternative to prolong life and also because poor adherence in the elderly is possibly related to depending on someone⁽¹⁸⁻¹⁹⁾.

With regard to skin color, we can observe that non-whites participants were more exposed to non-adherence to pharmacotherapy, a fact possibly correlated with other socioeconomic characteristics, for example, low-income, lower education and poorer access to health services. A study conducted in the city of Salvador with 200 low-income individuals with hypertension observed an increasing trend of non-adherence, with 46.4% among whites, 67.0% among browns and 80.3% among blacks⁽²⁰⁾. Data from this study on adherence and ethnicity show the importance of more detailed analysis of its associations, with a view to the possibility that blacks can choose more often to the abandonment or non-adherence to

treatment. It should be noted that there were no other studies that demonstrate so clearly the association between ethnicity and non-adherence to antihypertensive treatment.

Another social characteristic that, according to the literature, influence non-adherence to pharmacotherapy of CD patients is marital status. Individuals with hypertension experience limitations in lifestyle and have to adapt to new ways of conducting their routines, sometimes leading to frustration, dissatisfaction, sadness and depression. Thus, the involvement of a family member in the treatment becomes a facilitator component for adherence to pharmacotherapy, since it represents emotional support in difficult times⁽⁹⁾. A literature review study points marital status as a sociodemographic predictor variable to antihypertensive pharmacotherapy adherence, and when compared to singles, married hypertensive individuals showed to be twice as likely to adequately carry out treatment⁽¹⁸⁾.

In the present investigation, it was also observed that low educational level was associated with non-adherence. Lower socioeconomic levels, represented by low income and low education are associated with higher prevalence of hypertension and the risk factors for both increased blood pressure and non-adherence to pharmacotherapy⁽³⁾. A study conducted in a city in southern Brazil with 595 individuals with hypertension corroborates this finding, as it revealed that 87.3% of non-adherent individuals to pharmacotherapy had lower socioeconomic and educational levels⁽⁶⁾.

The low level of education is also associated with the difficulty of understanding the recommendations of health professionals and the importance of continuous use of medications to control CD, so it is characterized as an influential socioeconomic factor of treatment non-adherence⁽⁶⁾. Regarding SH, which is an asymptomatic chronic condition, low education is still an aggravating factor, since it hinders the recognition of the need for medical care, continuity of care, regardless of medication use⁽¹³⁾.

However, adverse economic conditions, such as financial difficulties, low income, are also described as factors that can limit treatment adherence, but also cause more episodes of hospitalization and re-hospitalization⁽¹⁹⁾. Other studies report that high family income is associated with greater adherence⁽⁶⁾, or even the lack of money to buy medicines explains no adherence, even when medication are not available in the BHU or due to difficulties to access health services⁽⁹⁾.

In this study, on the other hand, family income was not detected as interfering factor in non-adherence to anti-hypertensive pharmacotherapy, perhaps because of other variables, which are representative indicators of socioeconomic status and that directly influence income, have been presented as predictors of outcomes of interest, such as skin color and education.

Studies indicate that the time of diagnosis, the chronicity of the disease and the lack of symptoms are important factors that also influence treatment abandonment^(6,17). However, in this study no significant differences were observed in the time of diagnosis regarding no adherence. It is believed that soon after diagnosis during early treatment there is greater induction of non-adherence and abandonment. On the other hand,

as hypertension is an insidious chronic disease, long-lasting and most of the time asymptomatic, there is also a tendency of many people to not recognize it as a disease. In addition, the perception of improvement with the initiation of treatment can lead to discontinuation. Thus, various confounding factors have influenced this variable. Regarding the number of antihypertensive medications consumed by the participants, it was evident that those with prescription of three or more drugs had higher chances of non-adherence to treatment. Unlike what was found in this research, a study conducted in a city in southern of Brazil with 595 individuals with hypertension showed that fewer medications was associated with non-adherence⁽⁶⁾. In turn, the authors of this study stated that older people, with longer periods of treatment and better socioeconomic and health care conditions, besides taking more medications, try to take them with greater adherence, including antihypertensive.

Thus, it can be inferred that not only the number of medication consumed for hypertension influences the non-adherence to treatment, but also the health care provided to patients. In this perspective, a study conducted in the Institute of Cardiology of Rio Grande do Sul, along with 92 individuals with hypertension, victims of acute myocardial infarction, showed that non-adherence to antihypertensive pharmacotherapy was related more to the precariousness of care and drug distribution (23,2%) than to the complexity of therapy (12,7%)⁽¹⁹⁾.

For this reason, the variables related to health care are important predictors of adherence/non-adherence to treatment. Doctors' visit can be one of the parameters to assess it⁽¹¹⁾. In this study, individuals who did not visit the doctors and who did not have private health insurance were more likely not to adhere to drug treatment. When they have private health insurance, individuals tend to use more health services and, so, those who more frequently attend medical appointments, whether in public or private sectors, typically have greater reduction in blood pressure levels. Thus, the patient's presence in the health unit is crucial to control hypertension, because it brings individual motivation, which leads to certain attitudes that contribute to the reduction of BP⁽¹¹⁾.

Meetings and frequent appointments provide better monitoring of blood pressure levels, as well as the opportunity to have more access to information, it could be a basis for adherence to guidelines on the pharmacological and non-pharmacological treatment. A key benefit of the greatest number of visits is the possibility of therapeutic adjustment and monitoring of the occurrence of side effects⁽¹¹⁾.

Besides being observed in practice, there is evidence that the frequent visits also provide more effective change in lifestyle and well-being of patients with possible reduction of anxiety and stress⁽¹¹⁾. However, there are controversies in the national literature. A study conducted in a city in the south-east of the country with 400 individuals with hypertension showed that health care did not show statistical significance on the adherence/non-adherence since both individuals mentioned difficult or very difficult access to visit the doctor⁽¹⁰⁾. On the other hand, another study in southern Brazil showed that the variables related to health services pointed to the

fact that people with the last appointment for more than six months had higher risk for non-adherence⁽⁶⁾.

The BP control requires not only individual participation, but also health team care within an efficient program of hypertension control. The difficulties in controlling blood pressure levels are different because many factors permeate, influence and shape the process, with the aggravating factor, the lack of symptoms, which can lead patients to the need of differentiated service.

Increasing adherence to pharmacotherapy is not an easy task. Educational, behavioral or technological resources interventions carried out by health professionals to improve adherence to treatment have limited results and need to be developed and adapted to the characteristics of the people involved in the process and the contexts of health services⁽¹⁷⁾.

Despite some methodological limitations, such as the fact that the study participants were selected from those registered in *Hiperdia Program* and who performed medical treatment for at least one year, which resulted in a sample of mostly elderly women, and even the various possible methods for identification of non-adherence, which complicates the comparability of results, it can be stated that the prevalence of people who do not adhere to the anti-hypertensive pharmacotherapy in primary care in Maringa is high and not very different from what has been found in other Brazilian cities. These issues are, therefore, a challenge for the health sector in cities with different population sizes and located in different regions of the country.

As previously mentioned, the adoption of intervention measures aimed at increasing the number of individuals who adhere to pharmacotherapy, is neither simple nor easy, because it is necessary to consider the many factors involved in the process. However, the results are disturbing and indicate the urgency of efforts by managers and health professionals on the need for more effective measures in controlling hypertension.

In this perspective, these findings may bring new thoughts and ways of acting with the population with hypertension, especially considering the bio-socio-economic profile of each individual monitored by primary care. The actions that can ensure greater effectiveness in adherence to pharmacotherapy, in our perception, are based on: development of educational activities about the disease and treatment, usage of accessible language to the population, resulting in more active user participation and healthy interaction with therapy; prescriptions with lower complexity, through the association of antihypertensive drugs as well detailed and legible information, especially for the elderly, people with lower educational levels and high complexity treatments; encouraging the figure of caregivers for patients with signs of non-adherence to treatment, and the ongoing advice and supervision to the active participation of the patient in the therapeutic program.

Thus, nursing consultations and the creation of a space for exchanging experience and practices in the group of individuals with hypertension represent strategies that encourage understanding of medical recommendations that patients receive about their treatment, generating a positive impact on physical, mental and emotional health of these people and their families. Its achievement should be part of routine practice of nurses, as this professional has a central role in clients' health

education, especially for individuals with CD who have low social and educational levels.

CONCLUSION

The results evidenced that 42.65% of individuals with hypertension monitored by primary care did not adhere to drug treatment, which can be considered worrying since

non-adherence is the main trigger of early and late complications of hypertension. The results also showed that individuals with hypertension who had certain biological, socio-economic, and health monitoring features had higher chances of not adhering to pharmacotherapy, such as non-white ethnicity, low educational level, the greater number of medications for blood pressure control, did not visit the doctor and had no private health care.

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