

## An Assessment of Adherence to Antihypertensive Treatment and Associated Factors in Patients at the Yaounde General Hospital

Chiabi RM<sup>1\*</sup>, Tembe E<sup>1</sup>, and Menanga AP<sup>1,2</sup>

<sup>1</sup>Faculty of Medicine and Biomedical Sciences, The University of Yaounde I, Cameroon

<sup>2</sup>Hypertension Unit, Yaounde General Hospital, Cameroon

\*Corresponding Author: Chiabi RM, Faculty of Medicine and Biomedical Sciences, The University of Yaounde I, Cameroon.

Received: December 23, 2019

Published: December 31, 2019

© All rights are reserved by Chiabi RM, et al.

### Abstract

**Background:** Hypertension is responsible for at least 45% of deaths due to heart disease. The number of people with uncontrolled hypertension is increasing because of population growth and ageing. A very high prevalence rate of hypertension of 29.7% was reported in Cameroon. Hypertension requires long term management and follow-up. Adherence to therapy is a key component of a successful management. Few studies have been done in Cameroon regarding antihypertensive treatment adherence. This study was therefore designed to assess the adherence status and associated factors to antihypertensive therapy in hypertensive patients followed-up at Yaounde General Hospital.

**Methods:** This was a cross-sectional analytic study conducted at the external consultation service of the cardiology unit of the Yaounde General Hospital. This study was carried out over a period of seven months. Patients admitted into this study were selected consecutively and those that met our inclusion criteria were selected prior to interviewing. Two sitting blood pressure measurements were taken on both arms with a pretested electronic sphygmomanometer. We assessed the adherence level of the study population by using the validated Morisky 8-item medication adherence scale together with other possible factors responsible for poor adherence.

**Results:** Of the 181 patients screened, 175 were retained for the study. Using the 8-item Morisky Medication Adherence Scale, we noted that 40.6% were medium adherers; and 26.9% were low adherers. This means that, 32.6% of participants had good adherence while 67.4% had poor adherence. After multivariate analysis with logistic regression, several variables were found to be significantly associated with poor adherence: first cycle secondary education ( $p=0.0209$ ; OR=4.6623), living singly ( $p=0.0003$ ; OR=4.6623), trip duration of one hour or more ( $p=0.008$ ; OR=7.3925), middle socioeconomic status ( $p=0.006$ ; OR=2.6814), uncontrolled blood pressure status ( $p<0.0001$ ; OR=5.5704), presence of handicap ( $p=0.0117$ ; OR=4.1222), presence of side effects ( $p<0.0001$ ; OR=11.5143), and taking medication in the evening ( $p=0.0399$ ; OR=2.5452).

**Conclusion:** This study depicted a low level of patient adherence to antihypertensives and the existence of several factors responsible for this status quo. It is of utmost importance that all the hindering factors be addressed by healthcare professionals in order to achieve good blood pressure control. Healthcare professionals need to reinforce sensitization of patients with hypertension on the need to adhere to their treatments which is lifelong in order to avoid comorbidities.

**Keywords:** Adherence; Antihypertensive; Morisky; Yaounde

### Introduction

According to the World Health Organization (WHO), cardiovascular diseases account for about 17 million deaths per year globally i.e. nearly one third of the total [1]. Of these cardiovascular diseases, hypertension accounts for 9.4 million deaths worldwide and 7.0% of global disability adjusted life-years in 2010 [2]. Hypertension is a serious medical condition and constitutes a major public health problem. The number of people with uncontrolled

hypertension increased from 605 million in 1980, to 978 million in 2008, because of population growth and ageing [3].

In developing countries, its morbidity and mortality are increasing due to sedentary life and changes in lifestyle [4]. In 2015, Kingue, et al. reported a very high prevalence rate of hypertension (29.7%) in Cameroon, with the tendency of a steady rise towards a super epidemic in the next 20 years to come [5]. It is, therefore

a reasonable guess to say that, medication non-adherence might be responsible for the prevalence of high blood pressure levels in Cameroon. With this in mind, effective strategies have to be developed in order to foster adherence to antihypertensive treatments by patients. The latter must be encouraged to participate in medical decisions by actively getting involved in the selection, adjustment of drug treatment and in changes in lifestyle in order to maximize the usefulness of the therapeutic regimen [6].

Hypertension requires long term management and follow-up. Adherence to therapy is a key component of a successful management. WHO defines adherence as the extent to which a person's behavior taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider [7]. Adherence is to be differentiated from compliance which suggests that a patient is passively following the doctor's orders and that the treatment plan is not based on a therapeutic alliance.

To the best of our knowledge, few studies have been done in Cameroon regarding antihypertensive treatment adherence and their correlates and those few portray relatively low levels of therapeutic adherence. This study was therefore designed to assess the adherence status and associated factors to antihypertensive therapy in hypertensive patients followed-up at the Cardiology Unit of the Yaounde General Hospital (YGH).

## Methods

A cross-sectional analytic study was conducted in the outpatient consultation service of the cardiology unit in the YGH for a period of 7 months.

### Sampling

#### Inclusion criteria

Hypertensive patients:

- Aged 18 years and above;
- Ambulatory and on antihypertensive treatment for at least 6 months prior to recruitment period;
- Who gave informed consent.

#### Non-inclusion criteria

Hypertensive patients:

- With mental impairment or psychiatric disease;
- With difficulty in communication and without a translator;
- Who gave incomplete information necessary for the study;
- Who did not to give informed consent.

Cochran's formula [8],  $n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$ , was used to estimate the sample size. The following assumptions were made: previous data indicated an adherence rate of 12.9% in Garoua [9]. So por-

tion was taken as 12.9% ( $p = 0.129$ ), 95% confidence interval, and 5% margin of error ( $d = 0.05$ ). Computing into the above formula, the minimum sample size required for the study was 173. In this study, 181 potential participants were identified during consultations. Of the 181 potential candidates, 6 were not included; 3 did not have time to participate in the study and 3 gave incomplete information. Finally, 175 participants were retained for the study as they complied with the stated inclusion criteria.

### Data collection procedure

In accordance with research ethics, ethical clearance was obtained from the Institutional Review Board of the Faculty of Medicine and Biomedical Sciences of the University of Yaounde I, as well as authorization from the Directorate of the YGH before the recruitment of patients for the study. The study was explained to the patients and informed consent by signature was obtained prior to their enrolment into the study. During the study, the case report forms were kept secret by the investigators from people not involved in the study, in order to respect patient confidentiality.

### Approach with the participants

The patients admitted into this study were selected consecutively at the external consultation service of the cardiology unit. Patients that met our inclusion criteria were selected during consultations and interviewed immediately after. After obtaining their written consent, we proceeded by measuring their resting blood pressure (BP). Two sitting BP measurements were taken on both arms with a pretested electronic sphygmomanometer approximately 2 minutes apart. Another 2 minutes later, a third measurement was taken on the arm with the highest BP reading. Then an average of the last two readings was eventually used to determine the BP level during the visit. After recording the BP reading, we proceeded with an interview of the patients in order to fill the pretested questionnaires. BP measurements and interview were carried out in private in a consultation box. The 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults [10] was used to evaluate the level of control of patient BP:

- Hypertensive patients aged 60 years and above were considered to have a controlled hypertension if their average BP reading was <150/90 mmHg during the last 3 months and if they presented with no diabetes nor chronic kidney disease.
- Hypertensive patients aged 60 years and above were equally considered to have a controlled hypertension if their average BP reading was <140/90 mmHg during the last 3 months if they presented with diabetes or chronic kidney disease.
- Also, patients aged under 60 were considered to have a controlled hypertension if their average BP reading was <140/90 mmHg during the last 3 months and if they presented with or without other comorbidities (diabetes and chronic kidney disease).

At the end, the questionnaires were cautiously stored prior to data analysis. The variables to be investigated consisted of:

- **Sociodemographic data (independent variables):** Age, sex, zone of residence, marital status, trip duration to the hospital, level of education, and profession.
- **Socioeconomic data (independent variables):** Socioeconomic status classification (SES) adapted from the Revised Kuppuswamy's SES - January 2015 [11] where the projected family income was estimated from the Gross National Income (GNI) per capital; health insurance; monthly drug costs. A score of <5 was considered low SES; between 5 and 10 was considered middle SES; and >10 was considered high SES.
- **Clinical characteristics of respondents (independent variables):** Comorbidities present (if any); blood pressure readings; handicap present (if any).

We assessed the adherence level of the study population by using the validated 8-item Morisky Medication Adherence Scale (MMAS-8) [12]. Patients with a score of 8 on the scale were termed highly adherent, medium adherers were those with a score of 6 to <8, and those classified as low adherers were those with a score of <6. The instrument was used to identify patients with adherence problems. Patients were considered to have a poor adherence if they had <8 and good adherence if they scored 8 on the MMAS-8 (Table).

Cut-off score	Adherence status	
8	High adherers	Good adherence
[6-8]	Medium adherers	Poor adherence
<6	Low adherers	

**Table:** Cut-offs for MMAS-8.

### Statistical analysis

Data entry and analysis was undertaken using the statistical software Epi Info version 3.5.4. Data cleaning was performed to check for accuracy, consistency and that there were no missed values during entry. Frequencies, proportions and summary statistics were equally generated to describe the study population in relation to the relevant variables. Bivariate analysis using the  $\chi^2$  test was carried out to assess associations of each independent variable with the dependent variable. Variables with P-value <0.05 in bivariate analysis were selected as candidate variables for multivariate analysis with logistic regression. Odds ratio (OR) and 95% confidence interval were used to identify the presence and strength of association.

## Results

### Assessment of adherence to antihypertensive treatment

Using the 8-MMAS, we noted that 40.6% were medium adherers; and 26.9% were low adherers which meant 32.6% of participants had good adherence while 67.4% had poor adherence (Table 1).

Adherence profile (Morisky score)	Number	Percentage (%)
Low adherers	47	26.90
Medium adherers	71	40.60
High adherers	57	32.60
Total	175	100.00

**Table 1:** Distribution of adherence profiles

### Sociodemographic characteristics of the study population

Baseline characteristics of the study sample are described in Table 2. Of the 175 patients, 54.90% were men and 45.10% were women with a sex ratio of 1.2. The mean age of the study participants was  $60.1 \pm 11.1$  years with extremes from 33 to 88 years and with the age group  $\geq 60$  years being the most represented at 48.60%. The majority of the participants lived in an urban setting at 88.60% and 51.43% had a non-liberal profession represented in majority by public servants. Amongst the 175 participants, 66.30% of participants lived as a couple either legally married or not while 33.70% was single (either divorced, never married or widowed). Of the 175 participants, 84.60% spent less than 1 hour to reach the YGH. The mean trip duration was  $38.6 \pm 30.8$  minutes with extremes between 5 minutes and 3 hours. Most participants in our study had a secondary level of education at 42.20% while 2.30% never went to a formal system of education.

### Socioeconomic characteristics of the study population

The middle SES was represented at 39.4% and only 10.9% of our study population had a health insurance. The middle SES group was found to be significantly associated to poor therapeutic adherence after multivariate analysis (OR = 2.68;  $CI_{95} = 1.33-5.53$ ;  $p < 0.001$ ).

### Clinical characteristics

The clinical characteristics of the study population are summarized in figure 1. The High Normal BP group was most represented at 24.6%. Of the 175 participants, 57.7% had a controlled BP (figure 2). Among the 175 participants, 32 had a handicap of which 16.57% were physical. Presence of handicap was found to be significantly associated to poor therapeutic adherence (OR = 4.12;  $CI_{95} = 1.45-14.34$ ;  $p < 0.001$ ).

### Therapeutic characteristics

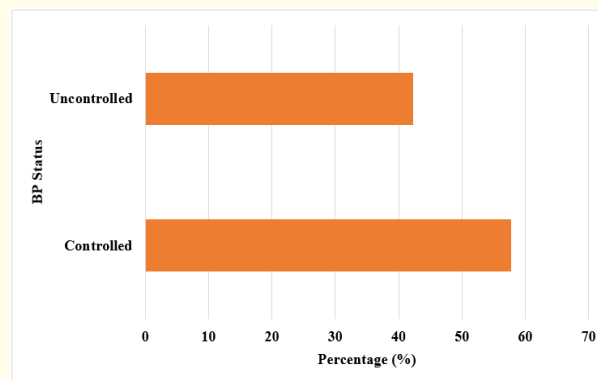
Calcium channel blockers (CCBs) were the most encountered monotherapy antihypertensive class in our study at 31.9%. Fixed-dose combination therapies were noted in this study (Table 3). They generally comprised of two or three active pharmaceutical ingredients. In this light, Angiotensin converting enzyme (ACE) inhibitors associated to thiazide diuretics were the most encountered bitherapy at 40.96%. And ACE inhibitors with Thiazide diuretics and CCBs was the most frequent tritherapy encountered at 81.8%.

	Poor adherence	Good adherence	Total	P-value*	P <sub>A</sub> **
Sociodemographic variables	n (%)	n (%)	n (%)		
Gender					
Male	66 (68.8)	30 (31.3)	96 (54.9)	0.400	
Female	52 (65.8)	27 (34.2)	79 (45.1)	0.400	
Age (years)					
<40	4 (80)	1 (20)	5 (2.9)	0.470	
[40-50[	18 (75)	6 (25)	24 (13.7)	0.270	
[50-60[	43 (70.5)	18 (29.5)	61 (34.9)	0.320	
≥60	53 (62.4)	32 (37.6)	85 (48.6)	0.110	
Place of residence					
Urban	98 (63.2)	57 (36.8)	155 (88.6)	<0.001	
Rural	20 (100)	0 (0)	20 (11.4)	0.000	
Profession					
Liberal	28 (58.3)	20 (41.7)	48 (27.4)	0.080	
Non-Liberal	61 (67.8)	29 (32.2)	90 (51.4)	0.520	
Unemployed	29 (78.4)	8 (21.6)	37 (21.1)	0.080	
Marital status					
Single	51 (86.4)	8 (13.6)	59 (33.7)	<0.001	0.0003
Couple	67 (57.8)	49 (42.2)	116 (66.3)	<0.001	
Level of education					
Never gone to school	3 (75)	1 (25)	4 (2.3)	0.610	
Primary	19 (70.4)	8 (29.6)	27 (15.4)	0.460	
Secondary-1 <sup>st</sup> cycle	31 (83.8)	6 (16.2)	37 (21.1)	0.010	0.0209
Secondary-2 <sup>nd</sup> cycle	22 (59.5)	15 (40.5)	37 (21.1)	0.170	
Higher education	43 (61.4)	27 (38.6)	70 (40)	0.110	
Trip duration (hour)					
<1	93 (62.8)	55 (37.2)	148 (84.6)	<0.001	
≥1	25 (92.6)	2 (7.4)	27 (15.4)	<0.001	0.008

**Table 2:** Sociodemographic parameters of the study population.

\*p-value from Chi-square test; \*\*P<sub>A</sub> is p-value adjusted for significant factors obtained from logistic regression analysis using variables with P < 0.05 in bivariate analysis as candidate variables.

**Figure 1:** BP gradings of the study population.



**Figure 2:** BP status of study participants.

Fixed-dose therapies	Number	Percentage (%)
Monotherapy		
CCBs*	69	31.90
BBs**	40	18.50
Loop diuretics	39	18.10
ACE*** inhibitors	29	13.40
Thiazide diuretics	18	8.30
Potassium-sparing diuretics	11	5.10
ARA2****	7	3.20
Centrally acting antihypertensives	3	1.40
Total	216	100.00
Bitherapy		
ACE inhibitors/Thiazide diuretics	34	40.96
ACE inhibitors/CCBs	18	21.69
ARA2/Thiazide diuretics	8	9.64
Thiazide diuretics/CCBs	7	8.43
BB/Thiazide diuretics	5	6.02
Potassium-sparing diuretics/Thiazide diuretics	5	6.02
CCBs/ARA2	4	4.82
BB/Thiazide diuretics	1	1.20
Thiazide diuretics/Rauwolfia alkaloid	1	1.20
Total	83	100.00
Tritherapy		
ACE inhibitors/Thiazide diuretics/CCBs	9	81.80
CCBs/ARA2/Thiazide diuretics	2	18.20
Total	11	100.00

**Table 3:** Distribution according to class of antihypertensive used by the study population

\*\*\*ACE: Angiotensin Converting Enzyme; \*\*\*\*ARA2: Angiotensin 2 Receptor Antagonist; \*\*BB: Beta Blocker; \*CCB: Calcium Channel Blocker

Table 4 portrays the therapeutic variables of the study population. Amongst the 175 participants, 21.7% took their drugs in the evening. Multivariate analysis showed a statistically significant association between taking medications in the evening and poor therapeutic adherence (OR = 2.55; CI<sub>95</sub> = 1.07-6.62; p = 0.030). Of the 175 participants, 38.3% experienced one or more side-effects due to ongoing treatment. Patients who experienced side effects were more associated with poor therapeutic adherence (OR = 11.51; CI<sub>95</sub> = 4.47-34.2; p<0.001). Amongst the 175 participants, 46.3% spent between 10000 and 20000 CFAP monthly for medication purchases with an average monthly cost at 14543 CFAP.

	Poor adherence	Good adherence	Total	P-value*	P <sub>A</sub> **
Therapeutic variables	n (%)	n (%)	n (%)		
Antihypertensive taken					
<3	92 (64.8)	50 (35.2)	142 (81.1)	0.090	
≥3	26 (78.8)	7 (21.2)	33 (18.9)	0.090	
Therapy type					
Monotherapy	84 (73)	31 (27)	115 (65.7)	0.020	0.0295
Bitherapy	55 (66.3)	28 (33.7)	83 (47.4)	0.440	
Tritherapy	5 (45.5)	6 (54.5)	11 (6.3)	0.100	
Posology					
Once daily	116 (67.4)	56 (32.6)	172 (98.3)	0.700	
Twice daily	22 (78.6)	6 (21.4)	28 (16)	0.120	
Thrice daily	1 (100)	0 (0)	1 (0.6)	0.670	
Moment the drug was taken					
Morning	109 (67.3)	53 (32.7)	162 (92.6)	0.580	
Afternoon	6 (60)	4 (40)	10 (5.7)	0.420	
Evening	31 (81.6)	7 (18.4)	38 (21.7)	0.030	0.0399
Morning, evening	22 (81.5)	5 (18.5)	27 (15.4)	0.070	
Morning, afternoon, evening	1 (100)	0 (0)	1 (0.6)	0.670	
Side-effects					
Yes	62 (92.5)	5 (7.5)	67 (38.3)	<0.001	<0.001
No	56 (51.9)	52 (48.1)	108 (61.7)		
Type of medication taken					
Specialty	106 (68.4)	49 (31.6)	155 (88.6)	0.300	
Generic	44 (71)	18 (29)	62 (35.4)	0.290	
Monthly drug cost (FCFA)					
<10000	33 (56.9)	25 (43.1)	58 (33.1)	0.030	
[10000-20000]	59 (72.8)	22 (27.2)	81 (46.3)	0.100	
[20000-30000]	20 (74.1)	7 (25.9)	27 (15.4)	0.290	

≥30000	6 (66.7)	3 (33.3)	9 (5.1)	0.610
Duration on treatment (years)				
<10	66 (68)	31 (32)	97 (55.4)	0.423
[10-20]	37 (71.2)	15 (28.8)	52 (29.7)	0.252
≥20	15 (57.7)	11 (42.3)	26 (14.9)	0.132
*p-value from Chi-square test; **PA is p-value adjusted for significant factors obtained from logistic regression analysis using variables with P < 0.05 in bivariate analysis as candidate variables.				

**Table 4:** Distribution of therapeutic variables.

### Association of adherence with BP status

Of the study participants, 36.57% who had a poor adherence to medication equally had an uncontrolled BP (Table 5). Of the 74 participants having an uncontrolled BP, 86.49% had poor therapeutic adherence. Uncontrolled BP was found to be significantly associated with poor therapeutic adherence with adjusted OR at 5.57 and adjusted p value < 0.001.

BP status	Good adherence		
	Yes (%)	No (%)	Total (%)
Controlled	47 (26.86)	54 (30.86)	101 (57.71)
Uncontrolled	10 (5.71)	64 (36.57)	74 (42.29)
Total	57 (32.57)	118 (67.42)	175 (100)

**Table 5:** Distribution according to blood pressure status and good adherence.

## Discussion

### Sociodemographic and socioeconomic characteristics

Ensuring patient adherence to antihypertensive medications in order to prevent complications remains a major challenge to public health in many developing countries. Poor adherence to treatment is the single most important reason for uncontrolled hypertension, serious complications and wastage of health care resources [4]. Our main objective was to assess adherence level and its associated factors to antihypertensive treatment among adult hypertensive patients followed-up at the YGH.

Our study sample comprised 175 participants whose average age was 60.1 ± 11.1 years. The 60 years and above age group was the most represented (48%; n = 48). Our results are in line with the previous literature [1,13-15]. These studies have in common is that there is a general incremental trend in the prevalence of hypertension in adults aged 25 and above.

The sex ratio was 1.2 in favor of males (54.90%). Several authors have reported a similar finding [1,16-18]. In a 2012 study carried out in Cameroon on 2,120 persons, Dzudie, *et al.* reported

that HBP was more frequent in the male population (50.10%) than in the female population (44.60%) [19].

Most participants in our study went through secondary education (42.29%). Our results were in line with previous literature [9,18,20-23]. This research was undertaken in an urban setting where basic education is promoted and secondary education institutions are very much present. Patients who had a 1<sup>st</sup> cycle secondary education were more associated with a poor level of adherence compared to those who had other educational levels (p=0.0209; OR=3.0287). This was similar to findings by Mbouemboue, *et al.* in 2016 in Cameroon [9]; Hussain, *et al.* in 2006 in Bangladesh [24]; and Boima, *et al.* in 2013 in Nigeria and Ghana also reported insufficient levels of education [23]. Patients with insufficient background of the disease will have the tendency to neglect medication adherence and thus be subject to high BP setbacks.

We noted that 66.30% of participants lived as a couple either legally married or not. Other authors reported similar results [4,9,13,18,20-23,25]. Patients who were single were more associated with a poor level of adherence (p=0.0003; OR=4.6623). Lo, *et al.* reported in 2016 in China reported a similar finding [26]. Living singly could encourage forgetfulness about drug taking and neglect of appointments with physicians as opposed to patients living as couples.

The majority of our study population (84.60%) spent less than 1 hour to reach the YGH. The reason for this was that most patients lived in neighboring quarters. Patients who lived 1 hour or more away from the hospital were more associated with poor therapeutic adherence (p=0.008; OR=7.3925). A similar finding was gotten from Ambaw, *et al.* in 2012 in Ethiopia [4]. Patients living far away from health centres have the tendency of absenting from their medical appointments. This can create a breach in patient follow-up, foster poor adherence and lead to uncontrolled BPs.

Only 10.90% of our study population had a health insurance. A similar result is observed in a study by Mbouemboue, *et al.* in 2016 in Cameroon who had 8.60% [9]. This could be primarily because of the fact that health insurance is not mandatory in the current health-care system, and in part because of the lack of awareness on the benefits of health insurance. On the contrary, Behnood-Rod, *et al.* in 2016 in Iran had 87.80% of participants with health insurance [14]. A reason for this high record could be that health insurance is fully integrated into Iranian healthcare systems and thus easy access to health services.

Middle socioeconomic status was more associated with a poor level of adherence (p=0.006; OR=2.6814). Patients in this socioeconomic class usually have difficulties purchasing their medications which were predominantly specialties and therefore expensive. In

this light, health care providers should promote the prescription of generic drugs which are affordable and accessible.

### Clinical and therapeutic characteristics

Our study revealed that 57.70% of the study population had a controlled BP. This was higher than what was reported in previous literature. Mbouemboue, *et al.* in 2016 in Cameroon had 48.57% [9]; Akoko, *et al.* in 2017 in Cameroon had 42.1% [21]; Behnood, *et al.* in 2016 in Iran had 43.6% [14]; Okwuonu, *et al.* in 2015 in Nigeria had 33% [18]. A reason for the high level of BP control in our study is that patients are given regular appointments especially upon treatment initiation in order to appreciate therapeutic efficiency. Physicians comply with treatment guidelines to change or intensify antihypertensive therapy if BP remains uncontrolled with pharmacotherapy.

The majority of drugs screened in this study were CCBs (31.90%) present as fixed-dose monotherapy. Hedna, *et al.* in 2015 in Sweden had 62.10% drugs acting on the renin-angiotensin system in their study [15]. The reasons for this is that CCBs are first-line treatment for primary hypertension in patients over the age of 55 and black patients of African [27-30]. CCBs are also readily available locally mainly as generics thus facilitating a wider access of antihypertensives.

Of the 74 participants having an uncontrolled BP, 86.49% had poor therapeutic adherence. Patients with an uncontrolled BP were more associated with poor therapeutic adherence than those with a controlled BP ( $p < 0.001$ ;  $OR = 5.5704$ ). Boima, *et al.* had a similar finding [23]. This association therefore confirms that poor adherence to antihypertensive medication is responsible for the increasing prevalence of hypertension.

In our study, 18.29% had a form of handicap of which 16.57% were physical handicaps. Patients with a handicap were more associated with poor therapeutic adherence compared to those without ( $p = 0.0117$ ;  $OR = 4.1222$ ). Mbouemboue, *et al.* had a similar finding [9]. Any form of handicap affects a person's quality of life and also normal medication taking. Patients with a handicap go through extra challenges in order to correctly take their medications as prescribed. They therefore need assistance from family and friends to improve adherence.

Patients who experienced side effects were more associated with poor therapeutic adherence compared to those who did not experience it ( $p < 0.0001$ ;  $OR = 11.5143$ ). Lin, *et al.* reported a similar finding [17]. It is important for physicians to address medication side effects in patients promptly. This will prevent therapeutic gaps which are likely to occur in the presence of these side effects. Drug changes or dosages are therefore imperative in this case.

Patients who took their medications in the evening were more associated with poor therapeutic adherence compared to those who took their drugs at other times ( $p = 0.0399$ ;  $OR = 2.5452$ ). Patients are more likely to forget when told to take drugs in the evening before bedtime. Daily duties associated with physical and mental stress deter patients from medication taking thus constituting a hindrance to good adherence.

### Adherence characteristics

Our study revealed that 32.60% were high adherers; 40.60% of participants were medium adherers; and 26.90% were low adherers according to the Morisky medication adherence scale. Mbouemboue, *et al.* and Akoko, *et al.* reported dissimilar figures in their respective studies [9,21]. High adherers were low in a similar study by Behnood-Rod, *et al.* where 49.60% showed low adherence to antihypertensives, 33.90% had moderate adherence and 16.40% showed high adherence [14]. These figures varied mainly because of the different methodologies used in assessing adherence. The ultimate goal of health care intervention is to encourage good adherence of patients to their antihypertensive drugs. This will have the effect of controlling their BP thence preventing complications.

### Conclusion

This study depicted a low level of patient adherence to antihypertensive therapy and the existence of several factors responsible for this status quo. It is of utmost importance that all the hindering factors be addressed by healthcare providers in order to achieve good BP control thus preventing other complications. Health professionals need to reinforce sensitization of patients with hypertension on the need to adhere to their treatments which is lifelong in order to avoid comorbidities. In context, it is very necessary for patients to be prescribed generic drugs which are less expensive in order to increase access and improve treatment adherence.

Public services also have a role to play in reinforcing information, education and communication in the whole country on non-communicable diseases especially hypertension, so that patients know the importance of adhering to antihypertensive treatments prescribed. Access to treatment also has to be made easy by accelerating the implementation of the universal insurance coverage in Cameroon so that patients could easily purchase their antihypertensive drugs.

### Limits

- The study was carried out in the YGH and so the results obtained cannot be used to generalize the adherence levels in the Centre region. More data has to be collected from various hospitals and clinics in order to bring out a general trend in adherence levels.
- The research did not investigate adherence levels in patients suffering from a mental handicap or disease.

## Bibliography

1. World Health Organization. "A global brief on Hypertension: Silent killer, global public health crisis" (2013): 39.
2. Lim SS., *et al.* "A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010". *Lancet* 380.9859 (2012): 2224-2260.
3. MM Finucanev., *et al.* "National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 million participants". *Lancet* 377.9765 (2011): 557-567.
4. Ambaw AD., *et al.* "Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital, Northwest Ethiopia". *BMC Public Health* 12 (2012): 282-288.
5. Kingue S., *et al.* "Prevalence and Risk Factors of Hypertension in Urban Areas of Cameroon: A Nationwide Population-Based Cross-Sectional Study". *The Journal of Clinical Hypertension* 17.10 (2015): 819-824.
6. Osterberg L and Blaschke T. "Adherence to Medication". *The New England Journal of Medicine* 353.5 (2005): 487-497.
7. World Health Organization. Adherence to long-term therapies: Evidence for action (2003): 194.
8. Charan J and Biswas T. "How to Calculate Sample Size for Different Study Designs in Medical Research?". *Indian Journal of Psychological Medicine* 35.2 (2013): 121-126.
9. Mbouemboue OP., *et al.* "Determinant therapeutic nonadherence to antihypertensive treatment: a hospital-based study outpatients in Northern Cameroon". *International Journal of Medical Science and Public Health* 5.3 (2016): 547-554.
10. James PA., *et al.* "Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eight Joint National Committee". *JAMA* 311.5 (2014): 507-520.
11. Raj Guru MS., *et al.* "Revised socio-economic status scale for urban and rural India - Revision for 2015". *Socioeconomica* 4 (2015): 167-174.
12. Morisky DE., *et al.* "Predictive Validity of A Medication Adherence Measure in an Outpatient Setting". *The Journal of Clinical Hypertension* 10.5 (2008): 348-354.
13. Demoner MS., *et al.* "Factors associated with adherence to antihypertensive treatment in a primary care unit". *Acta Paul Enferm* 25.1 (2012): 27-34.
14. Behnood-Rod A., *et al.* "Adherence to Antihypertensive Medications in Iranian Patients". *International Journal of Hypertension* (2016): 1-14.
15. Hedna K., *et al.* "Adherence to Antihypertensive Therapy and Elevated Blood Pressure: Should We Consider the Use of Multiple Medications?". *PLoS ONE* 10.9 (2015): 1-14.
16. Haynes R., *et al.* "Helping patients follow prescribed treatment: Clinical applications". *JAMA* 288.22 (2002): 2880-2883.
17. Lin YP., *et al.* "Adherence to Antihypertensive Medications among the Elderly: A Community-based Survey in Tainan City, Southern Taiwan". *Taiwan Geriatr Gerontol* 2.3 (2007): 176-189.
18. Okwuonu CG., *et al.* "Adherence to antihypertensive medication and its correlates among individuals with hypertension in a semi-urban community of Southern Nigeria". *JMBR* 14.1 (2015): 5-17.
19. Dzudie A., *et al.* "Prevalence, awareness, treatment and control of hypertension in a selfselected sub-Saharan African urban population: a cross-sectional study". *BMJ Open* 2 (2012): e001217.
20. Essomba NE., *et al.* "Facteurs de Non Observance au Traitement AntiHypertenseur chez les Adultes à Douala". *Health Sciences and Diseases* 18.3 (2017): 51-57.
21. Akoko BM., *et al.* "Knowledge of Hypertension and Compliance with Therapy Among Hypertensive Patients in the Bamenda Health District of Cameroon: A Cross-sectional Study". *Cardiology and Therapy* 6.1 (2017): 53-67.
22. Hashmi SK., *et al.* "Factors Associated with Adherence to Anti-Hypertensive Treatment in Pakistan". *PLoS ONE* 2.3 (2007): 1-8.
23. Boima V., *et al.* "Factors Associated with Medication Nonadherence among Hypertensives in Ghana and Nigeria". *International Journal of Hypertension* (2015): 1-8.
24. Hussain S., *et al.* "Non-Adherence to Antihypertensive Treatment in Essential Hypertensive Patients in Rajshahi, Bangladesh". *AKMMC Journal* 2.1 (2011): 9-14.
25. Tufon EN., *et al.* "Adherence to Antihypertensive Treatment Factors Associated with Adherence Amongst Hypertensive Patients on Follow-up at Mankon Sub-Divisional Health Center, Ntingkang, Bamenda, Cameroon". *VRI Signaling* 2.1 (2014): 27-31.



26. Lo SHS., *et al.* "Adherence to Antihypertensive Medication in Older Adults with Hypertension". *Journal of Cardiovascular Nursing* 31.4 (2016): 296-303.
27. Sweetman SC. "Martindale: The Complete Drug Reference". Thirty-sixth edition. Great Britain: Pharmaceutical Press (2009): 3709.
28. Jackson R and Bellamy M. "Antihypertensive drugs". *BJA Education* 15.6 (2015): 280-285.
29. Brunton LL., *et al.* "Goodman & Gilman's: The pharmacological basis of therapeutics". Eleventh Edition. New York 2006.
30. Pepper GA. "Pharmacology of Antihypertensive Drugs". *Journal of Obstetric, Gynecologic and Neonatal Nursing* 28.6 (1999): 649-659.

#### Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

**Website:** <https://www.actascientific.com/>

**Submit Article:** <https://www.actascientific.com/submission.php>

**Email us:** [editor@actascientific.com](mailto:editor@actascientific.com)

**Contact us:** +91 9182824667