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## Assessment of patient's antihypertensive medication adherence level in non-comorbid hypertension in a tertiary hospital in Nigeria

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The objectives of the present study were to assess the patient's antihypertensive medication adherence level in non-comorbid hypertension and to identify and evaluate the causes of medication non-adherence. Randomly sampled one hundred and fifty two (152) outpatients suffering from non-comorbid hypertension, visiting the consultant outpatient clinic of the cardiology unit of the department of medicine, University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Borno state, Nigeria were interviewed using a self-administered pre-tested structured, mostly closed ended questionnaire. Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 16 for windows. Adherence was measured on a 12-point scale, recorded a mean score of  $9.37 \pm 1.22$ . The study participants had a mean age of  $49.29 \pm 1.04$  years. The adherence level was 85.5%. There was a significant association between adherence and age, marital status, tribe, state of origin, cost of antihypertensive medications, number of antihypertensive medications, age/gender with  $P < 0.01$ . Major reasons for non-adherence were feeling worse (side effects of the antihypertensive medications), and feeling better with  $P < 0.01$ . In conclusion, this study revealed a high level of adherence among the study participants.

**Key words:** Adherence, Antihypertensive medications, Hypertension, Nigeria

Received: 31 May 2012 / Revised: 04 Jun 2012 / Accepted: 06 Jun 2012 / Online publication: 12 Jun 2012

### 1. INTRODUCTION

Hypertension is a silent killer disease, a time bomb in both the developed and developing nations of the world. It is one of the most significant risk factors for cardiovascular (CV) morbidity and mortality resulting from target-organ damage to blood vessels in the heart, brain, kidney, and eyes [1]. These complications can manifest due to lack of patients medications adherence as either atherosclerotic vascular disease or other forms of cardio vascular (CV) diseases [1]. No matter how appropriate and effective patient's antihypertensive therapy may be, poor clinical outcomes will be the end result if medication adherence becomes an issue. Studies have shown that in many countries less than 25% of patients treated for hypertension achieve optimum blood pressure [2].

Adherence has been defined as the "active, voluntary, and collaborative involvement of the patient in a mutually acceptable course of behaviour to produce a therapeutic result [3,4]. This definition implies that the patient has a choice and that both patients and providers mutually establish treatment goals and the medical regimen [3]. Medication adherence usually refers to whether patients take their medications as

prescribed, as well as whether they continue to take a prescribed medication. Medication adherence behaviour has thus been divided into two main concepts, namely, adherence and persistence. Although conceptually similar, adherence refers to the intensity of drug use during the duration of therapy, whereas persistence refers to the overall duration of drug therapy [5,6].

Adherence to long-term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower [7]. It is undeniable that many patients experience difficulty in following treatment recommendations. Poor adherence to long-term therapies severely compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics [7].

There are many different methods for assessing adherence to medications Osterberg [8] categorized these methods as either direct or indirect. Direct methods include directly observed therapy, measurement of the level of medicine or metabolite in blood, and measurement of the biological marker in blood [8]. Although these direct methods are considered to be more robust than indirect methods, there are also limitations to these direct methods of adherence

assessment. For example, patients may hide pills in their mouth and discard them later, or there may be variations in metabolism that can affect serum levels. Furthermore, these direct methods are not practical for routine clinical use. Indirect methods of adherence assessment include patient questionnaires, self-reports, pill counts, rate of prescription refills, assessment of the patient's clinical response, electronic medication monitors, measurement of physiological markers, and patient diaries [8]. The most commonly used indirect methods include patient self-report, pill counts, and pharmacy refills. Studies on patient's antihypertensive medication adherence in hypertension have been undertaken in some parts of the country.

A study in Kano [9] in the north western geopolitical region of Nigeria observed good adherence to drug treatment in 54.2% of the respondents and poor adherence among the remainder. Another study that was conducted by Ekwunife, *et al* [10], on predictors of self-reported adherence to antihypertensive medications in a Nigerian population was carried out in Nsukka, a semi-urban city in South-Eastern Nigeria. A study on treatment adherence and risk of non-adherence among hypertensives was conducted at a teaching hospital in Ogun state, south western Nigeria [11]. However, these studies were carried out in the other geopolitical regions; we undertook the study in a tertiary hospital in Maiduguri, Borno state, north eastern Nigeria, a region which to the best of our knowledge has never been evaluated in terms of patient's antihypertensive medication adherence in non-comorbid hypertension. Therefore, the objectives of the study were to assess the patient's antihypertensive medication adherence level in non-comorbid hypertension and to identify and evaluate the causes of antihypertensive medications non-adherence.

## 2. EXPERIMENTAL

### 2.1 Setting

The study was conducted at the consultant outpatient clinic of the cardiology unit of the department of medicine, University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Borno state, Nigeria. This area lies between latitude 1150 N and longitude 1350 E with an altitude of 345 meters above sea level and shares borders with three (3) West African countries namely Chad, Niger, and Cameroun, whose indigenes often reside and trade in Maiduguri. The vegetation falls under the Sahel zone of West African. It is a semi-arid region with a short period of rainfall.

### 2.2 Data collection process

Ethical clearance and verbal informed consent were obtained from the Ethics and Research Committee of the hospital and participants respectively before the commencement of the study. Randomly sampled one hundred and fifty two (152) outpatients suffering from hypertension

alone that visited the consultant outpatient clinics of the cardiology unit of the department of medicine, UMTH, Borno state, Nigeria between August – November 2011 were interviewed using a self-administered pre-tested structured, mostly closed ended questionnaire. The questionnaire was divided into three parts. Part A was aimed at obtaining the demographic profile of the participants. Part B was aimed at gathering information on the disease condition. Part C was however designed using a 2-point Likert response format consisting of Yes, No options and a few open ended questions, aimed at identifying the various causes of the medication non-adherence.

### 2.3 Data analysis

Statistical Package for Social Sciences (SPSS) version 16.0 for windows was used for analysis. For the 2-point Likert scale used, a mark of two (2) was awarded for Yes, and one (1) for No when they are expected; a mark of one (1) was for Yes, and two (2) for No when they are not expected; a mark of zero (0) was awarded for no response. The adherence items were aggregated (6 structured questions on medication taking behaviours: 1. Do you take your medications as prescribed? 2. Do you sometimes miss taking your medications? 3. Do you often refill your prescriptions? 4. Do you often keep your clinic appointments? 5. If you feel better, do you stop taking your medication? 6. If you feel worse while taking your medications, do you stop taking your medications?) to create the adherence scale on a 12-point scale.

The mean score ( $9.37 \pm 1.22$ ) was used for adherence assessment. Participants that scored zero (0) were considered neutral; 1 – 8 non-adherent; and 9 – 12 as adherent. Chi-square analysis was used to test for statistical significance. A p-value of  $\leq 0.01$  was considered statistically significant.

## 3. RESULTS AND DISCUSSION

### 3.1 Demographic and socio-economic characteristics

Respondents' ages ranged from 19-83 years with a mean age of  $49.29 \pm 1.04$  years (Table 1). The mean age obtained in this study is in line with that obtained in a study conducted in Karachi, Pakistan [12] and Ekiti, south western Nigeria [13], and contrary to the one obtained in Sagamu, south western Nigeria [14], and Ibadan [15] also in south western Nigeria. Although, majority of the participants were within the age group 40-49 years, however age was significantly associated with gender (Table 2). This is not in line with the finding of a study that was undertaken in Ibadan [15] where the peak age-categories were 46-55 years and no significant association existed. Female patients dominated (Table 1) with 97(63.8%), this is in agreement with the studies carried out in Sagamu [14], Ekiti [13] in south western Nigeria respectively, and Ilorin [16] north central Nigeria. Most of

the participants were married 136(89.5%). Civil servants were in the majority 47(30.9%).

Table 1  
Demographic, socio-economic and clinical characteristics of study population (n = 152) of mean ( $\pm$  SD) age of 49.3 ( $\pm$  1.0)

Respondents' characteristics	Frequency	Percentage
<b>Gender</b>		
Male	55	36.2%
Female	97	63.8%
<b>Marital status</b>		
Married	136	89.5%
Single	3	2.0%
Divorced	5	3.3%
Widowed	8	5.3%
<b>Occupation</b>		
Civil Servants	47	30.9%
Retired workers	16	10.5%
Business Persons	23	15.1%
Farmers	1	0.7%
House Wives	18	11.8%
Unemployed	46	30.3%
Students	1	0.7%
<b>Tribe</b>		
Kanuri	29	19.1%
Hausa	16	10.5%
Igbo	17	11.2%
Yoruba	3	2.0%
Bura	8	5.3%
Babur	10	6.6%
Bolewa	3	2.0%
Fulani	7	4.6%
Jukun	6	3.9%
Marghi	18	11.8%
Shuwa	7	4.6%
Others	28	18.4%
<b>State of origin</b>		
Borno	99	65.1%
Adamawa	8	5.3%
Taraba	7	4.6%
Yobe	3	2.0%
Imo	3	2.0%
Plateau	3	2.0%
Ekiti	2	1.3%
Kebbi	5	3.3%
Jigawa	1	0.7%
Anambra	8	5.3%
Kogi	2	1.3%
Benue	1	0.7%
Enugu	5	3.3%
Kaduna	2	1.3%
Kwara	2	1.3%
Edo	1	0.7%
<b>Town of residence</b>		
Maiduguri	140	92.1%
Yola	5	3.3%
Taraba	1	0.7%
Potiskum	1	0.7%
Jos	1	0.7%
Biu	1	0.7%
Madagali	2	1.3%
Gwoza	1	0.7%
<b>Level of education</b>		
Uneducated	62	40.8%
Primary	17	11.2%
Secondary	17	11.2%
Tertiary	56	36.8%
<b>Monthly income</b>		
No response	119	78.3%
₦10000-30000	8	5.3%
₦ 31000-50000	10	6.6%
₦ 51000-70000	6	3.9%
₦ 71000-90000	3	2.0%
₦ 101000 and above	6	3.9%

₦ - Nigerian Naira

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Majority of the participants were Kanuris 29(19.1%), the town of their residence and state of origin were Maiduguri 140 (92.1%) and Borno state 99(65.1%), respectively (Table 1). This was due to the fact that Kanuri is the indigenous tribe of the people of Maiduguri in Borno state, Nigeria. Based on educational career, slightly above half of the study population 90(59.2%) had no formal education. Most of the participants 119(78.8%) did not state their monthly income (Table 1); in general, this attitude is common in Nigeria where people hardly disclose how much they earn.

### 3.2 Respondent's disease characteristics

In regards to the Health care professional that diagnosed the disease, Medical Doctors 145(98.0%) were in majority. Most of the respondents 145 (95.4%) believed the diagnosis. The peak category of duration of the disease since diagnosis was 2-5 years 77(50.7%) with a mean of  $5.93 \pm 6.4$  years (Table 3). Studies have proven that acute illnesses are associated with higher adherence than chronic illnesses [17]. In addition, longer duration of the disease may adversely affect adherence [18]. This might be the reason of remarkably high level of adherence (Table 3) recorded in this study.

Table 2  
Cross tabulation of age group and gender

Age group	Gender		Total
	Male	Female	
20 and below	1 0.7%	0 0.0%	1 0.7%
21-29	2 1.3%	2 1.3%	4 2.6%
30-39	4 2.6%	6 3.9%	10 6.6%
40-49	11 7.2%	53 34.9%	64 42.1%
50-59	15 9.9%	30 19.7%	45 29.6%
60 and above	22 14.5%	6 3.9%	28 18.4%
Total	55 36.2%	97 63.8%	152 100.0%

$X^2 = 34.104$ ;  $df = 5$ ;  $P = 0.000$

### 3.3 Adherence level

The adherence level was 85.5% (Table 3). This is in agreement with the findings of the studies carried out in other parts of the country where majority of the participants were adherent. Studies in places like Jos [19] showed adherence level to be 67.6%, Lagos [20] 65.8%, Port Harcourt [21] 60%, Ilorin [16] 67.7%, Sagamu [14] 78.7%, Nsukka [10] 70.7%. A high adherence level has been found outside Nigeria. A study in the United Kingdom [22] reported an adherence level of 74.1%. On the contrary, some studies in Kano [9], Sokoto [23], Ibadan [15], and Iran [24] reported

Table 3

Clinical characteristics of study population (n = 152)

Respondents' characteristics	Frequency	Percentage
Diagnostic personnel		
Medical doctor	149	98.0%
Pharmacist	1	0.7%
Lab scientist	2	1.3%
Duration of disease since diagnosis (mean $\pm$ SD) 5.93 $\pm$ 6.4		
1 year and below	29	19.1%
2-5 years	77	50.7%
6-10 years	24	15.8%
11-15 years	10	6.6%
16-20 years	7	4.6%
21-25 years	2	1.3%
26-30 years	1	0.7%
31 years and above	2	1.3%
Believed the diagnosis		
No	7	4.6%
Yes	145	95.4%
Adherence		
Neutral	1	0.7%
Non-adherent	21	13.8%
Adherent	130	85.5%

Table 4

Variables with significant association with adherence level among respondents (n = 152)

Sl.No.	Variable	X <sup>2</sup>	df	P value
1	Age	41.132	10	0.000
2	Marital Status	51.742	6	0.000
3	Tribe	55.402	22	0.000
4	State of origin	1.037	30	0.000
5	Number of antihypertensive medications	51.959	6	0.000
6	Cost of antihypertensive medications	76.746	4	0.000

Table 5

Variables with no significant association with adherence level among respondents (n = 152)

Sl.No.	Variable	X <sup>2</sup>	df	P value
1	Gender	1.838	2	0.399
2	Monthly income	21.943	10	0.015
3	Occupation	6.703	12	0.877
4	Town of residence	7.456	14	0.916
5	Educational level	9.688	6	0.138
6	Belief in disease	1.375	2	0.503
7	Belief in treatment	0.425	2	0.809

otherwise. There was a significant association between age and adherence (Table 4); this might be due to fewer numbers of people within the lower age bracket of below 20-39 years suffering from hypertension when compared with the larger number of respondents within the age range of 40-60 years and above. The study carried out in Iran supports this finding while it is contrary to the finding in Sagamu [14]. Out of the total participants 130(85.5%) that were adherent, 85(58.6%) of them reported that their medications were costly were adherent despite the high cost of their medications. Cost of antihypertensive medications was significantly associated with adherence (Table 4). Healthcare cost should not be a big burden if the patient has a relatively high income or health insurance [25]. There was a significant association between

number of antihypertensive medications and adherence (Table 4). Majority of the participants 62(40.8%) taking between 5 and 6 antihypertensive medications were adherent. This finding is consistent with the finding of Fodor, *et al* [26] which revealed that increase in the number of medications increases adherence, and inconsistent with the finding of Murray, *et al* [27].

Most married respondents 116(76.3%) were more adherent than the singles. There was a significant association between marital status and adherence (Table 4). Marital status might influence patients' adherence with medication positively [28]. Another research supported this, although in a different disease state [29]. The help and support from a spouse could be the reason why married patients were more adherent to medication than single patients. There was a significant association between tribe and adherence (Table 4). The minority tribes had the least adherence among all the tribes of the study participants. However, a plausible explanation for this may be due to patient's language barriers of the minority [25] tribes in the study area. Hence, due to these confounding variables, ethnicity may not be a true predictive factor of poorer adherence.

Most of the female respondents 83 (54.6%) were adherent but there was no significant association between gender and adherence (Table 5). This finding is in line with the findings of Eze, *et al* [14], Degoulet, *et al* [30], Hadi, *et al* [24] and inconsistent with the finding of a study undertaken in Jos in the north central, Nigeria [19]. Majority of the respondents 101(66.4%) did not state their monthly income. Consequently, the majority that did not state their monthly income might be the reason of lack of association between monthly income and adherence (Table 5). Nevertheless, this is in agreement with the finding of other studies that revealed that income was not related to adherence level [31, 32], and contrary to the outcome of a study carried out in Kano [9] which revealed that participants with monthly income higher than ₦10, 000 were more adherent than those with less than ₦10, 000 per month. Another study found out that patients who had low income were more likely to be non-adherent to treatment [30]. There was no significant association between occupation and adherence (Table 5).

Majority of the respondents 120(78.9%) that reside in Maiduguri were adherent, but there was no significant association between town of residence and adherence (Table 5). On the basis of education level, 56(36.8%) uneducated respondents were adherent, there was no association between level of education and adherence (Table 5). This finding is consistent with the findings of some researchers that showed that patients with lower education level have better adherence [33,34], but not in line with the findings in Kano, [9] and Nsukka [10] respectively. Uneducated patients or those with lower educational level might have more trust in physician's advice. From these results, it seems that educational level may not be a good predictor of therapeutic adherence [25]. Most respondents

Table 6

Cross tabulation of reasons for not taking medications as prescribed and the rate of taking medications as prescribed

If NO, why?	Do you take your drugs as prescribed?		Total
	No	Yes	
No response	2 1.3%	115 75.7%	117 77.0%
Cost of medications	6 3.9%	0 0.0%	6 3.9%
The nature/busy schedule of work	4 2.6%	0 0.0%	4 2.6%
Don't like taking medications	4 2.6%	0 0.0%	4 2.6%
Too much medications	1 0.7%	0 0.0%	1 0.7%
Side effects(When I feel worse)	10 6.6%	0 0.0%	10 6.6%
Forgetfulness	2 1.3%	0 0.0%	2 1.3%
When I feel better	8 5.3%	0 0.0%	8 5.3%
Total	37 24.3%	115 75.7%	152 100.0%

$X^2 = 1.413$ ;  $df = 7$ ;  $P = 0.000$

125(82.2%) and 124(83.2%) that believed the diagnosis and the prescribed pharmacotherapy respectively were adherent but no significant association was found between them and adherence (Table 5).

### 3.4 Factors that militate against taking medications as prescribed

Majority of the respondents 115 (75.7%) take their medications as prescribed, while 37 (24.3%) do not. In Table 6, the reasons for not taking their medications as prescribed were attributed to cost of the medications 6(3.9%), the nature and busy work schedules 4(2.6%), dislikes for medications 4(2.6%), too much medications 1(0.7%), side effects of medications-when feeling worse 10(6.6%), forgetfulness 2 (1.3%), when feeling better 8(5.3%). However, discontinuing medications when feeling worse, and well were the most common causes of medication non- adherence from the study. The statistical (chi square) analysis showed a significant association with  $P < 0.01$  (Table 6).

Other studies revealed some of these factors: cost of the medications [14,15,25]. Cost is a crucial issue in patient's adherence especially for patients with chronic diseases as the treatment period could be life-long [35]. A number of studies found that patients who had no insurance cover [24, 36], were more likely to be non-adherent to treatment. Side effects of the medications (feeling worse) [10,14,15,24], Feeling better [14]. Patient's knowledge about their disease and treatment is not always adequate. Some patients lack understanding of the role their therapies play in the treatment [35], others lack knowledge about the disease and consequences of poor adherence [17]. Some patients thought the need for medication was intermittent, so they stopped the drug to see

whether medication was still needed [37]. For these reasons, patient education is very important to enhance adherence. Counseling about medications is very useful in improving patient's adherence [35]. Healthcare providers (Pharmacists, and Medical Doctors) should give patients enough education about their treatment and disease [31]. Busy schedule [9], Pharmacists should make suggestions that incorporate multiple daily doses into the patient's routine work. Forgetfulness [8,24]; forgetfulness is a widely reported cause of non- adherence to medications therefore, Pharmacists should endeavour at all times to write instructions on medications use for patients. Written instructions are better than oral advice for reminding patients to take medication(s).

### 3.5 Respondent's attitudes on a missed dose of their medications

A few of the respondents 30(19.7%) reported that they have never missed a dose of their antihypertensive medications, while majority 120(78.9%) sometimes missed their doses. Their reported actions towards missed dose were taking medications as soon as they remember if the time of the next dose is not too close/ skipping it if the time of the next dose is close 110(72.3%), forgetting the missed dose completely 10(6.6%). Chi square showed significant association with  $P < 0.01$ (Table 7). This implies that positive attitudes towards missed dose enhance adherence.

### 3.6 Factors that hinder respondents from keeping their clinic appointments

Out of the total respondents, majority 128(84.2%) keep their clinic appointments always, whereas 24(15.8%) do not (Table 8). This finding is in agreement with the finding in Kano [9] where majority keep their clinic appointments. The reasons for not keeping their clinic appointments were nature and busy schedule of work 11(7.3%). Doctors know why 5(3.3%), and lengthy time spent in the clinic/dislikes for hospital environments 6(3.9%). Chi square analysis showed a significant association with  $P < 0.01$  (Table 8). Patient education and counseling are indispensable here because some lack understanding of the value of clinic visits and would not take it seriously. Written instructions are more effective than oral advice for reminding patients who are non-adherent with clinic appointments to always visit the clinic when due [35,38].

### 3.7 Study limitations

Some of the limitations are worth mentioning including the inability to determine the health insurance status of the participants. The use of self-reporting questionnaires which only rely on the honesty of those reporting them may not adequately reflect the complex aspects of the medication taking behaviour. Interviewer bias was another potential

Table 7

Cross tabulation of If yes, what do you do when you miss a dose of your medication(s)?/Do you sometimes miss taking your medication at the time you are supposed to take it

If YES, what do you do when you miss a dose of your medications(s)?	Do you sometimes miss taking your medication at the time you are supposed to take?			Total
	No response	No	Yes	
No response	2 1.3%	30 19.7%	0 0.0%	32 21.1%
Take as soon as i remember if the time of the next dose is not too close/Skip it if the time is close to the next dose	0 0.0%	0 0.0%	110 72.3%	110 72.3%
Forget it completely	0 0.0%	0 0.0%	10 6.6%	10 6.6%
Total	2 1.3%	30 19.7%	120 78.9%	152 100.0%

$X^2 = 1.520$ ;  $df = 6$ ;  $P = 0.000$

Table 8

Cross tabulation of reasons for occasional appointment keeping and the rate of keeping appointment

If NO, why?	Do you often keep your clinic appointment?		Total
	Yes	No	
No response	128 84.2%	2 1.3%	130 85.5%
Nature/busy schedule of work	0 0.0%	11 7.3%	11 7.3%
Ask the doctor	0 0.0%	5 3.3%	5 3.3%
Due to the time spent in the clinic/don't like hospital environment	0 0.0%	6 3.9%	6 3.9%
Total	128 84.2%	24 15.8%	152 100.0%

$X^2 = 1.372$ ;  $df = 4$ ;  $P = 0.000$

limitation due to fact that those who had no formal education filled the questionnaire with the help of interpreters, though we believe that this effect should be minimal as all of them were trained before the commencement of the study and they were highly experienced in this regard. The cross-sectional nature of the study creates difficulties in ascertaining casualty.

#### 4. CONCLUSIONS

It is concluded that the respondents in the area of study were adherent to their anti-hypertensive medications. Various causes of medication non-adherence were identified in a few. Therefore, we recommend interventions that will address these problems of non-adherence in order to improve adherence the more. Some of such interventions include the healthcare providers (Physicians, and Pharmacists) improving on the areas of patient education and counselling, communication between them and patients, medication selection bearing in mind cost and intolerable side effects of the medications, shorter wait time and accessibility of the clinics to the patients. The federal government of Nigeria should endeavour to extend the National Health Insurance Scheme (NHIS) to the employees of the state government throughout the federation and kick start the informal sector of

the scheme, in order to cushion the medication cost burden on these patients.

#### ACKNOWLEDGEMENTS

We wish to express our profound gratitude to the management and staff of University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Borno state, Nigeria, in particular the staff of the cardiology unit, department of medicine for their immense support during the data collection processes. Our sincere heartfelt thanks go to Mrs. Glory Ogechi Okoro for her moral and technical support in the course of this work.

#### APPENDIX I

#### QUESTIONNAIRE

##### Part A

(Tick (√) the appropriate option(s))

- Age \_\_\_\_\_ Years
- Sex
  - Male [ ]
  - Female [ ]
- Marital status
  - Married [ ]
  - Single [ ]
  - Divorced [ ]
  - Widowed [ ]
- Occupation
  - Civil servant [ ]
  - Retired worker [ ]
  - Businessman/woman [ ]
  - Unemployed [ ]
  - Others specify \_\_\_\_\_
- Tribe \_\_\_\_\_
- State of origin \_\_\_\_\_
- Town of residence \_\_\_\_\_
- Level of education
  - Not educated [ ]

- (b) Primary [ ]  
 (c) Secondary [ ]  
 (d) Tertiary [ ]

9. Monthly income ₦ \_\_\_\_\_

### Part B

(Tick (✓) the appropriate option(s))

1. Who told you that that you are suffering from Hypertension?

- (a) Medical doctor  
 (b) Pharmacist  
 (c) Lab scientist  
 (d) Others specify \_\_\_\_\_

2. When were you diagnosed? \_\_\_\_\_

3. Do you really believe that you are suffering from Hypertension?

- (a) Yes [ ]  
 (b) No [ ]

4. Do you know that the disease condition could cause severe consequences with regards to your health and daily activities?

- (a) Yes [ ]  
 (b) No [ ]

### Part C

(Tick (✓) the appropriate option(s))

1. Do you believe that the treatment prescribed will reduce the present or future severity of the condition?

- (a) Yes [ ]  
 (b) No [ ]

2. How can you assess the cost of the medications?

- (a) Cheap [ ]  
 (b) Costly [ ]

3. Do you often keep your clinic appointment?

- (a) Yes [ ]  
 (b) No [ ]

4. If No, why? \_\_\_\_\_

5. Do you often refill your prescriptions?

- (a) Yes [ ]  
 (b) No [ ]

If No, why? \_\_\_\_\_

6. Do you take your medications as prescribed?

- (a) Yes [ ]  
 (b) No [ ]

If No, why?

- (a) You cannot afford to buy the medications always.  
 (b) The nature/schedule of your work makes it impossible.  
 (c) You don't like taking medications  
 (d) You cannot swallow medication(s)  
 (e) Medications you are taking are too many  
 (f) Forget to take medications  
 (g) Others specify \_\_\_\_\_

7. How many medications are you taking at a time?

8. If you feel better, do you stop taking your medication?

- (a) Yes [ ]  
 (b) No [ ]

9. If you feel worse while taking your medications, do you stop taking your medications?

- (a) Yes [ ]  
 (b) No [ ]

10. Inappropriate use of the medications as prescribed could lead to

- (a) Improvement of health  
 (b) Development of more problem (s)  
 (c) Cure of the disease (s)

11. Do you sometimes miss taking your medications?

- (a) Yes [ ]  
 (b) No [ ]

If yes, what do you do when you miss a dose of your medications?

- (a) Take it as soon as you remember/ Skip it if the time is close to the next dose [ ]  
 (b) Forget it completely [ ]  
 (c) Take a double dose the following day [ ]  
 (d) Others specify [ ]

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