Factors in Adherence to Antihypertensive Regimen in Imo State South Eastern Nigeria

Dozie, Winnie Ugonma1*, Akinyele Oluwadara Ozavize1, Ezelote Judith Chinelo1, Okorie Onyinye Mary1 and Ikechukwu Nosike Simplicius Dozie1

1Department of Public Health, Federal University of Technology, Owerri, Nigeria.

ABSTRACT

Aim: To determine the level of adherence and identify factors that prevent adherence to antihypertensive treatment.

Study Design: The study employed the survey method.

Methods: Descriptive study was employed and a simple random sampling were used to collect data from 200 randomly consenting respondents.

Results: Results showed that the majority of the respondents (65.0%) were females, a large proportion (48.5%) were in the age bracket of 51 – 60 years, the majority (93.5%) were educated and 45.5% were civil servants. A majority (57.5%) of the respondents agreed that lack of income family support was a factor that could lead to non-adherence and only 40% adhered strictly to the doctor’s prescription.

Conclusion: Based on the findings, the level of adherence to antihypertensive regimen among the respondents is satisfactory. However, several factors hindered their adherence to medication.
among which were financial stress, access to drugs and availability of health facilities. It is therefore recommended that the cost of medication be subsidized and health facilities brought closer to people to enhance adherence to regimen.

Keywords: Adherence; antihypertensive regimen; factors; hypertension; South Western Nigeria.

1. INTRODUCTION

Hypertension also known as high or raised blood pressure (BP) is a public health challenge worldwide [1]. Hypertension is the leading risk factor for death worldwide and affects both men and women [2]. High blood pressure or hypertension is defined by two levels by 2017 America college of cardiology/America Heart Association (ACC/AHA) [3]: (1) elevated BP with systolic pressure between (SBP) 120 and 129mmhg and diastolic pressure (DBP) less than 80mmhg and (2) stage 1 hypertension with SBP of 130 to 139mmhg or a DBP of 80 to 89mmhg. Arterial hypertension is the most important modifiable cardiovascular risk factor [4] and it is also the first modifiable risk factor accounting for 10.4 million deaths and 218 million attributable disability-adjusted life-years worldwide [5].

The highest prevalence of hypertension in the world occurs in sub-Saharan Africa [6]. Previous studies in sub Saharan Africa had shown a higher prevalence of urban centres than in rural communities but recent studies show a growing trend in prevalence of hypertension in rural communities compared to that of urban community. Prevalence of hypertension in Nigeria has progressively increased from 10.1%-13.3% and 8.9% in the late sixties between 38.8% to 44.5% and 34.8% recently in rural and urban communities respectively [7].

Considering the availability of effective medications and the attitude of hypertensive patients towards the control of hypertension, assessing adherence to medication could be a way of managing the disease. In other words, medication adherence although a complex issue with various associated factors is a very critical component in controlling blood pressure of patients within normal range and consequently achieving good health outcome in long term and also holding up the cardiovascular complication [8]. Adherence to antihypertensive regimen is an effective step for controlling blood pressure and preventing complications. However, certain factors affect a hypertensive patients’ adherence behaviour towards antihypertensive medication include patient-related factors (e.g., socio-demographic factors and the individual’s knowledge and skills), health system-related factors (such as treatment cost and patients’ resources), and provider-related factors (such as patient-provider relationships and communication [9].

Therefore, this study was designed to investigate the factors in adherence to antihypertensive regimen in Imo State South Eastern Nigeria.

2. MATERIALS AND METHODS

The study employed a descriptive study design. A sample of 200 hypertensives from Eziobodo Community in Owerri West local government area of Imo State participated in the study. The participants were selected using simple random sampling technique. Data were collected using structured questionnaire and interview schedule. The instruments were validated using face and content validity and tested for reliability using test-retest method. Verbal informed consent was obtained from each respondent and inclusion criterion was age 21 years and 70 years in Owerri West Local Government Area, Imo State. Three trained research assistants were involved in the collection of data from respondents. The SPSS (version 21.0) was used for data analysis. The statistical tools used were Chi-square test which was used to test the hypotheses.

3. RESULTS

Table 1 shows that most (65%) of the respondents were female, a greater proportion (48%) were in the age bracket of 51 – 60 years, the majority (69.5%) had secondary school education and a greater proportion (45.0%) were civil servants. This implies that the respondents are educated, aging and under government employ.

3.1 Non Adherence to Antihypertensive Regimen

Table 2 shows that the majority (57.5%) of the respondents identified family support (57.5%) as the major factor that could hinder adherence to
antihypertensive regimen. Furthermore, 60.5% of the respondents strongly agreed that financial stress was a hindrance to antihypertensive regimen, 39.0% strongly agreed that daily activities hindered adherence to antihypertensive regimen, 58.0% agreed that accessibility of drug in keeping with prescription hindered adherence to antihypertensive regimen while 57% strongly agreed that accessibility of healthcare facility was an encumbrance to antihypertensive regimen. Also, 29.5% of the respondents strongly agreed that lack of family and friends hindered antihypertensive regimen. On their view on lack of social support as hindrance, 43.5% strongly disagreed that it hindered antihypertensive regimen while 30.5% were indifferent. Regarding the role of health workers in compliance with standards, most (76.5%) agreed that it was a hindrance to antihypertensive regimen while 11.0% were indifferent.

Table 1. Distribution of respondents according to socio-demographic characteristics

| Socio-demographic variables | Frequency (200) | Percentage (%) |
|-----------------------------|-----------------|----------------|
| Sex                         |                 |                |
| Female                      | 130             | 65.0           |
| Male                        | 70              | 35.0           |
| Age distribution            |                 |                |
| 21-30                       | 8               | 4.0            |
| 31-40                       | 15              | 7.5            |
| 41-50                       | 48              | 24.0           |
| 51-60                       | 96              | 48.0           |
| 61-70                       | 33              | 16.5           |
| Education                   |                 |                |
| Primary                     | 9               | 4.5            |
| Secondary                   | 139             | 69.5           |
| Degree                      | 39              | 19.5           |
| No response                 | 13              | 6.5            |
| Occupation                  |                 |                |
| Civil servant               | 90              | 45.0           |
| Trader                      | 65              | 32.5           |
| Businesses                  | 5               | 2.5            |
| Farmer                      | 19              | 9.5            |
| Artisans                    | 4               | 2.0            |
| Others                      | 12              | 6.0            |
| No response                 | 5               | 2.5            |

Table 2. Non adherence to antihypertensive regimen

| Variables                                             | Frequency (n=200) | (%)   |
|-------------------------------------------------------|-------------------|-------|
| **Factors That Could Lead to Non Adherence**          |                   |       |
| Family support                                        | 115               | 57.5  |
| Social support                                        | 11                | 5.5   |
| Drug accessibility                                    | 17                | 8.5   |
| Level of relationship with health care provider       | 5                 | 2.5   |
| Others                                                | 8                 | 4.0   |
| Non response                                          | 44                | 22.0  |
| **Financial Stress as Hindrances**                    |                   |       |
| Strongly agree                                        | 121               | 60.5  |
| Disagree                                              | 53                | 26.5  |
| agree                                                 | 5                 | 2.5   |
| indifferent                                            | 21                | 10.5  |
| **Daily Activities Hindrance**                        |                   |       |
| Strongly agree                                        | 78                | 39.0  |
| Strongly disagree                                     | 59                | 29.5  |
| Agree                                                 | 20                | 10.0  |
| Disagree                                              | 7                 | 3.5   |
| Indifferent                                            | 36                | 18.0  |
### Variables

| Variables                                      | Frequency (n=200) | (%)     |
|-----------------------------------------------|-------------------|---------|
| **Accessibility of Drug in Keeping to Prescription** |                   |         |
| Agree                                         | 116               | 58.0    |
| Disagree                                      | 38                | 19.0    |
| Indifferent                                   | 46                | 23.0    |
| **Accessibility of Healthcare Facility as Hindrance** |                   |         |
| Strongly agree                                | 114               | 57.0    |
| Disagree                                      | 23                | 11.5    |
| Agree                                         | 32                | 16.0    |
| Indifferent                                   | 31                | 15.5    |
| **Lack of Family and Friends**                |                   |         |
| Strongly agree                                | 59                | 29.5    |
| Strongly disagree                             | 63                | 31.5    |
| Disagree                                      | 13                | 6.5     |
| Agree                                         | 29                | 14.5    |
| Indifferent                                   | 36                | 18.0    |
| **Lack of Social Support as Hindrance**       |                   |         |
| Strongly agree                                | 15                | 7.5     |
| Strongly disagree                             | 87                | 43.5    |
| Agree                                         | 26                | 13.0    |
| Disagree                                      | 11                | 5.5     |
| Indifferent                                   | 61                | 30.5    |
| **Role of Healthcare Workers in Compliance**  |                   |         |
| Agree                                         | 153               | 76.5    |
| Disagree                                      | 22                | 11.0    |
| Indifferent                                   | 25                | 12.5    |

#### 3.2 Level of Adherence to Antihypertensive Regimen

Table 3 shows that a large proportion of the respondents (40.0%) kept to doctors’ appointment while 6.0% were unresponsive. It also shows that 43.5% of the patients sometimes took the drugs as prescribed, 34.5% always took the drug and 2.0% did not take it. Furthermore, the result shows that 40.5% of the patients sometimes kept to prescribed diet, 25.8% always did while 4.0% did not take any.

#### 3.3 Hypothesis Testing

**3.3.1 Relationship between educational level and level of adherence**

From the table, it can be deduced that adherence to prescribed regimen was significantly associated with educational level of respondents ($X^2 = 25.496$, P-value = .000, $p < 0.05$).

**3.3.2 Relationship between occupation and level of adherence of respondents**

Table 5 shows that adherence to prescribed regimen is significantly associated with the occupation of the respondents ($X^2 = 48.306$, P-value = .000, $p < 0.05$).

#### 3.3.3 Relationship between depression and adherence to hypertension medication

Table 6 reveals that depression in respondents is significantly associated with adherence to hypertension treatment ($X^2 = 53.982$, P-value = .000, $p < 0.05$).

#### 3.3.4 Relationship between unrest and adherence

Table 7 contains information on the relationship between personal factors (family unrest) and adherence to prescribed regimen. The table shows that there is a statistically significant association between adherence to prescribed regimen and occupation of the respondents ($X^2 = 11.676$, P-value = 0.020, $p < 0.05$).  

### 4. DISCUSSION

Education could improve patients’ health literacy thereby enhancing their awareness and knowledge of the illness and chances of adherence to control measures. It could also enhance their communication with providers. [10] stated that adults are more likely to adhere to hypertensive control measures. Non-adherence according to [11] decreases with age and is more likely among women than men.
Non-adherence to antihypertensive regimen according to the findings was attributed to several factors which include family income support, financial stress, accessibility of drugs and healthcare facility and the roles of health workers. Financial hardship is an important barrier to compliance with treatment for hypertension [12]. According to [13] women in middle-low-income countries, across all ages had a higher prevalence of hypertension compared with high-income countries. [14] reported that patients who had healthcare insurance (provided by their employers) got more hypertension medications than those uninsured. This implies that availability of finance influenced adherence to antihypertensives. [14] found that in low income countries, the proportion of low adherence increased progressively and considerably with decreasing level of individual patient wealth. They further stated that many patients discontinued their treatment due to financial reasons. Social support networks are important in the long-term management of hypertension since those who have support from friends and family members had better compliance than those do not [12]. Access to medications, role of healthcare workers and proximity to healthcare facilities have been found to determine adherence to hypertension treatment. [15,16] contend that quality of relationship between the patient and the clinician, the communication style of the clinician and access to healthcare facilities impact adherence. Very expensive drugs might be unaffordable to the patients and hence discourage them from its use. Similarly, rural residents might not find it easy accessing healthcare facilities at urban centres and this might hinder their adherence. Non-adherence could worsen the health situation of patients leading to more adverse effects. Knowledge of factors that interfere with patients’ adherence to treatment will encourage actions that will enhance adherence.

Based on the findings, the level of adherence to antihypertensive regimen among the respondents was satisfactory. Compliance with treatment is characterized by the individual’s behaviour regarding the use of medication, recommended changes in lifestyle and attendance to medical appointments [17]. Poor compliance or adherence accounts for inadequate treatment, thus leading to uncontrolled blood pressure [18]. Adherence to antihypertensive regimen was found to be influenced by the respondents’ sociodemographic characteristics (educational level and occupation) and also some personal factors (depression and family unrest). Highly educated patients are likely to know more about hypertension and its treatment and would show more compliance than uneducated people. Education would increase the likelihood of the patients seeking information from various sources. It would also enhance communication between patients and clinicians. On the other hand, occupation plays a significant role in determining the patients’ level of adherence to treatment. Patients that are gainfully employed

| Variables                          | Frequency (n=200) | Percentage (%) |
|-----------------------------------|------------------|----------------|
| *In keeping to doctor’s appointment* |                  |                |
| Always                            | 80               | 40.0           |
| Missed only a few times            | 39               | 19.5           |
| Sometimes                         | 52               | 26.0           |
| None                              | 17               | 8.5            |
| Unresponsive                      | 12               | 6.0            |
| *Taking drugs as prescribed*      |                  |                |
| Always                            | 69               | 34.5           |
| Missed only a few times            | 28               | 14.0           |
| Sometimes                         | 87               | 43.5           |
| None                              | 4                | 2.0            |
| Unresponsive                      | 12               | 6.0            |
| *Keep to prescribed diet*         |                  |                |
| Always                            | 57               | 28.5           |
| Missed only a few times            | 38               | 19.0           |
| Sometimes                         | 81               | 40.5           |
| None                              | 8                | 4.0            |
| Unresponsive                      | 16               | 8.0            |
Table 4. Relationship between socio-demographic characteristics (educational level) and adherence to prescribed regimen

| Do you take your drugs as prescribed | Always | Missed only a few times | Sometimes | None | X² Value | P Value |
|--------------------------------------|--------|-------------------------|-----------|------|----------|---------|
| **Educational level of Respondents** |        |                         |           |      |          |         |
| Primary                             | 1a     | 0a                      | 8a        | 0a   | 9        | .000    |
| Secondary                           | 48a    | 13a                     | 62a       | 4b   | 127      |         |
| Degree                              | 12a    | 15b                     | 12a       | 0b   | 39       |         |

Table 5. Relationship between sociodemographic factor (occupation) and adherence to prescribed regimen

| Do you take your drugs as prescribed | Always | Missed only a few times | Sometimes | None | X² Value | P Value |
|--------------------------------------|--------|-------------------------|-----------|------|----------|---------|
| **Occupation of Respondents**        |        |                         |           |      |          |         |
| Civil Servant                        | 26a    | 15a                     | 45a       | 4a   | 90       | .000    |
| Trader                               | 20a    | 4a                      | 29a       | 0a   | 53       |         |
| Businesses                           | 0a     | 0a                      | 5a        | 0a   | 5        |         |
| Farmer                               | 15a    | 4a                      | 0b        | 0b   | 19       |         |
| Artisans                             | 4a     | 0a                      | 0a        | 0a   | 4        |         |
| Others                               | 0a     | 4b                      | 8a        | 0b   | 12       |         |

Table 6. Relationship between personal factors (depression) and adherence to prescribed regimen

| Can depression limit adherence | a little | Strongly yes | No | Count | % within Do you take your drugs as prescribed | Always | Missed only a few times | Sometimes | None | X² Value | P- value |
|-------------------------------|----------|--------------|----|-------|---------------------------------------------|--------|-------------------------|-----------|------|----------|----------|
| Count                         | 11a      | 4a           | 0a | 0b    | 26a                                          | 40     | 53.982                  | .000      |
| 73.3%                         | 0.0%     | 42.3%        | 0.0% | 0.0% | 52.6%                                      |        |                        |           |
| % within Do you take your drugs as prescribed | 4a | 0b | 22a | 0a | 26 | |
| % within Do you take your drugs as prescribed | 20.0% | 0.0% | 42.3% | 0.0% | 34.2% | |
| % within Do you take your drugs as prescribed | 0.0% | 80.0% | 3.8% | 100.0% | 13.2% | |
| **Total**                     | 15      | 5            | 52 | 4     | 76                                           |        |                        |           |
| % within Do you take your drugs as prescribed | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | |
Table 7. Relationship between personal factors (Family unrest) and adherence to prescribed regimen

| Family unrest on level of adherence | Do you take your drugs as prescribed |   |   |   | X² Value | P Value |
|------------------------------------|--------------------------------------|---|---|---|----------|---------|
|                                    | Always | Missed only a few times | Sometimes |   |   |
| Yes                                | Count  | 29 | 10 | 57 | 96 | 11.676<sup>a</sup> | .020 |
|                                    | % within Do you take your drugs as prescribed | 50.9% | 41.7% | 71.2% | 59.6% |
| No                                 | Count  | 13 | 9 | 10 | 32 |   |   |
|                                    | % within Do you take your drugs as prescribed | 22.8% | 37.5% | 12.5% | 19.9% |
| Sometimes                          | Count  | 15 | 5 | 13 | 33 |   |   |
|                                    | % within Do you take your drugs as prescribed | 26.3% | 20.8% | 16.2% | 20.5% |
| Total                              | Count  | 57 | 24 | 80 | 161 |   |   |
|                                    | % within Do you take your drugs as prescribed | 100.0% | 100.0% | 100.0% | 100.0% |

<sup>a</sup> Indicates significant difference.
can afford the cost of the treatment more than unemployed ones. Some employers have health insurance packages that relieve them of some financial burdens.

Stress and anxiety which are related to family unrest have been reported as common causes of hypertension. According to [12] patients who held these beliefs did not show better compliance to treatments. The result also highlighted the importance of family support in adherence to treatment. Patients with high social support will show more adherence than those who do not. Patients who have friends and family members concerned about their illness, giving reminders about medication had better compliance [19].

5. CONCLUSION
The respondents had a satisfactory level of compliance with antihypertensive regimen. This indicates their willingness to take measures that will control the epidemic. However, some factors hindered their adherence to the medications. The major factors relate to access to drugs and availability of healthcare facilities. Furthermore, sociodemographic and personal factors of the patients were found to influence their adherence to treatments. This implies that in designing any intervention aimed at treating this epidemic, patient-related factors in addition to others should be put into consideration. Furthermore, cost of the treatment should be subsidized to encourage adherence. Healthcare facilities should be situated close to rural residents to increase their access to the treatments.

COMPETING INTERESTS
Authors have declared that no competing interests exist.

REFERENCES
1. Ajayi IO, Sowemimo IO, Akpa OM, Ossiai NE. Prevalence of hypertension and associated factors among residents of Ibadan-North local government Ares of Nigeria. NigJcardiol. 2016;13:67-5.
2. Pan American Health Organization; 2016. Available:http://www.paho.org/hypertension/?/lang=en
3. Matthew RA, Eric HY. Hypertension; 2019. Available:http://emedicine.medscape.com/article/241381.overview
4. Jozef B, Maria P, Jan M, Katarinak, Jan L, Martin C. Central systolic Hypertension in Patients with well-controlled Hypertension. 2017. DOI: 10.1155/2017/8158974
5. Benjamin M, Nathalia K. Hypertension and its impact on stroke recovery: From a vascular to a parenchymal overview; 2019. DOI: 10.1155/2019/6843895.
6. David KD, Solomon N, Yeetey E, Harold A, Harry D, Mieks T, et al. prevalence of Hypertension in the middle belt of Ghana: A community based screening study; 2019. DOI: 10.1155/2019/1089578.
7. Effiong EA, Udeme EE, Aniema IA, Bassey EB. Prevalence of hypertension in Akwa ibom state south-south Nigeria: Rural versus Urban Communities. 2015;975819.
8. Iloh, G, Amadi, A. Essential hypertension in adult Nigerians in Primary care: A cross sectional study of the prevalence and associated family socio-biological factors in eastern Nigeria. European journal of preventive medicine. 2014;2(6):81-89.
9. Alsolami F, Hou X, Correa-vellez I. Factors affecting antihypertensive treatment adherence: A Saudi Arabian Perspective. 2012;2(4):27-32.
10. Peacock E, Krousel-Wood M. Adherence to antihypertensive therapy. Medical Clinics of North America. 2018;101(1):229 – 245.
11. Wang PS, Bohn RL, Knight E, Glynn RJ, Morgan H, et al. Non-compliance with antihypertensive medication: The impart of depression symptoms and psychosocial factors. 2002;504-511.
12. Baker-Goering, M, Roy, K and Howard, DH. Relationship between adherence to antihypertensive medication regimen and out-of-pocket costs among people aged 35 to 64 with employer-sponsored health insurance. Preventing Chronic Disease. 2016;16:180381.
13. DOI:http://dx.doi.org/10/5888/pcd16.180381
14. Osamor, PE. Owumi, BE. Factors associated with treatment compliance in hypertension in Southwest Nigeria. Journal of Health, Population and Nutrition. 2001; 29(6):619–628.15.
15. de Terline, MD, Kane, A, Kramoh, KE, Toure, IA, Mipinda, DIB, Nhavoto, C., Balde DM, et al. Factors associated with poor adherence to medication among hypertensive patients in
twelve low and middle income sub-Saharan Africa countries. PLoS ONE. 2019;14(7): e0219266. Available: https://doi.org/10.1371/journal.pone.0219266
15. Schoenthaler, A, Chaplin, WF, Allegrante, JP, Fernandez S, Diaz-Gloster M, Tobin JN. Provider communication effects on medication adherence in hypertensive African-Americans. Patient Education and Counselling. 2009;75:185-191.
16. Ryan, D Carr, A. A study of the differential effects of Tomm’s questioning styles on therapeutic alliance. Family Process. 2001; 40:67-77.
17. Wong, MC, Jiang, JY Griffiths, SM. Factors associated with antihypertensive drug compliance in 83,884 Chinese Patients: A cohort study. Journal of Epidemiology and Community Health. 2010;64:895–901.
18. Burt VI, Whelton P, Rocella EJ, Brown C, Cutler JA, Higgins M, et al. Prevalence of hypertension in the US adult population. Result from the Third National Health and Nutrition Examination Survey. 1988–1991. Hypertension. 1995;25:305–313.
19. Lewis LM, Askie P, Randleman S, Shelton-Dunston B. Medication adherence beliefs of community-dwelling hypertensive African-Americans. Journal of Cardiovascular Nursing. 2010;25(3):199–206.