COMPLIANCE OF NIGERIANS WITH DRUG TREATMENT OF SYSTEMIC HYPERTENSION: IS THIS JUST A LITERACY PROBLEM

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ABSTRACT

Patient's compliance (PC) is a very vital link between the medical process and treatment outcome. Many factors that affect it such as cost of drugs, adverse effect of drugs and perhaps inconvenient dosing have been addressed at different times, either by the drug manufacturers or the physician in hypertension management. The role of literacy on the compliance of the Nigerians in drug treatment of systemic hypertension was examined in a cross sectional study involving all the 770 patients that were seen in the cardiology clinic of the University of Benin teaching hospital over a two month period. Information which included ethnicity, marital status, occupation, highest level of education attained, names of drugs and the number of drugs taken were obtained by direct questioning using close ended questionnaire. This information was later analyzed by standard statistical methods. Of the 770 patients examined, 112 (14.5%) had no form of formal education; 130(16.9%) attempted or completed primary school educations, 94(12.2%) attempted or completed secondary school education; and 437(56.4%) had one form of tertiary education or the other ranging from diploma courses to degree programmes. Out of the770 patients, 546 (70.9%) could tell the number of drugs prescribed for them and only 359 (46.6%) could tell the names of their drugs. Only 186 patients (24.2%) could tell both the names and the number of drugs prescribed for them. The patient's compliance rate was 30.8% overall. The findings suggest that level of education does not guarantee drug compliance. The implication is that even the educated need to be educated about their participation in the treatment process.

INTRODUCTION

It is a well known fact that in out-patient medical care, patient's compliance is a very vital link between the medical process and treatment outcome1. It is also an important determinant of the quality of medical care1. Non-compliance can have deleterious consequences in the hypertensive patient2.Studies have shown that cost of drugs, adverse effect of drugs and perhaps inconvenient dosing can lead to withdrawal of patient participation in the partnership of treatment3,4. Little attention has been paid to the educational status of the patient or his or her level of literacy. Literacy is the ability to read and write and constitutes basic education. Illiterate individuals include those who never had formal education or did not complete primary school5. Nigeria is one of the educationally backward nations in the world. As at June, 2008, Nigeria's literacy level was placed at 56%5. This means that 44% of the population (that is, 61.6 million Nigerians) do not know how to read and write while most drug prescriptions are written in English language.. In this study therefore, the role of literacy on the compliance of the Nigerians with drug treatment of systemic hypertension is examined.

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PATIENTS AND METHODS:

This was a cross sectional study involving all the patients that were seen in the cardiology clinic of the University of Benin Teaching Hospital, Benin City , over a 3 month period. (June to August, 2006). All the 770 patients (430 men of mean age 58.8± 12.3 years, and 340 women of mean age51.8 ± 12.8years) who attended the clinic during this period were included in the study. This number represents about 25% of the total attendance to this clinic in 2007. For this study, hypertension was defined as sitting blood pressure of 140/90mmHg6. All the information which included ethnicity, age, marital status, occupation, highest level of education attained, number of drugs taken, number of drugs prescribed, reason for dosage omissions or discontinuation of drugs were obtained from case files; by direct questioning and also by use of open – ended questionnaire. The information was later tabulated and analyzed by standard statistical methods6 using SPSS version 16. Literacy level was determined by the highest level of education attained by the individual. Patient's compliance (PC) was determined by calculating the ratio of the number of drugs taken by the patient to the number of drugs prescribed for the patient expressed as percentage2 (PC= Number of drugs prescribed for the patient÷ Number of drugs taken by the patient x 100). Compliance rate (CR) was calculated as the ratio of the number of compliant patients to the number of patients on the drug treatment expressed as percentage (CR= number of compliant patients ÷ number of patients on the drug treatment x100). (This was easy to calculate since these patients were drawn from the author's clinic and number of drugs prescribed were obtained from the case files).Data analysis using SPSS version 16. The association between variables was examined using spearman's correlation. The independent effects of number of drugs prescribed and level of education (as predictor variables) on patients' compliance (dependent variable) were examined using multiple linear regressions. The student t-test was used to compare the means of two variables between groups. Values of $p < 0.05$ were taken as significant.

RESULTS:

Table 1 shows the baseline characteristics of the 770 patients examined according to their educational level, occupation and the average number of drugs prescribed. The average number of drugs prescribed per patient was 4.01±0.91 and the differences between the groups were not statistically significant. The patients who could tell the number of drugs prescribed for them were 546 in number (70.9%) and only 358(46.5%) could tell the names as well as the number of their drugs. Only 186 patients (24.2%) could tell both the names and the number of drugs prescribed for them. Thus CR was generally low; 30.8% overall, 31.8% for males and 28.3% for females respectively. The CR among the different educational groups is shown in table11. CR was highest among those that had tertiary education compared with any other group, $p < 0.001$. There was no significant difference in the means CR between the other educational groups. Figure 1 is a graphical representation of the variations in CR among different occupational groups. Although CR was highest among the learned, only one group of the learned had a compliant rate of up to 80%. Table III is the SPSS output for the multiple linear regression of number of prescribed drugs and patient's level of education on patient's compliance. The t –values indicate that both level of education and number of prescribed drugs significantly affect the compliance of patients. Bivariate analysis showed strong positive correlation between level of education and patients' compliance and also a significant negative correlation

between number of prescribed drugs and patients' compliance (p< 0.001).

Among the non-compliant ones 6% gave various drug side effects as reason for discontinuity; 69% gave non-affordability and non availability as reasons for failure to use drugs and seldom took the complete number of drugs; but 25 % had no reason for failure to use prescribed drugs. Figure 2 is a graphical illustration of the degree of knowledge of the names of prescribed drugs in different patient groups. This was least among traders, mechanics and drivers majority of whom were illiterates.

DISCUSSION:

A close look at the distribution of patients in this study shows that majority had at least attempted secondary school and therefore by definition, they were literate5. The spread of the social groups however shows a rather even distribution of people in different works of life. This is because they were mainly referred cases from different clinics and hospitals in Edo State metropolis.

The highly significant difference between CR in the tertiary group and other levels of literacy or education shows that the level of literacy may be highly contributory to the individual's ability to take the desired number or type of drugs prescribed. The absence of 100% knowledge in most elite groups shows that not all elites showed interest in the knowledge of prescribed drugs, or rather, that not all understood that treatment outcome is dependent on patient's compliance. Therefore, the state of being literate or educated is not synonymous with health literacy7. Sensible patients do fail to take prescribed treatment too2.

The lack of interest in the knowledge of prescribed drugs is reflected in the number that seldom took all the drugs and in the level of compliance. This demonstrates a

lack of insight into what compliance is. There is a possibility that the most valuable drug could be the one that is constantly left out. The knowledge of a drug name or its right dosing makes a patient conscious of the need for the refilling of a drug before it gets exhausted. This is where health literacy comes in 7. A regular observation in the outpatient clinic is that most hypertensive patients are more interested in knowing when to stop a drug rather than how well their hypertension is controlled. This is probably the reason for the generally low level of compliance as well as the control rate in systemic hypertension2, 8- 9.

Health literacy is a discrete form of literacy that uses indicators to quantify health promotion and prevention activities7.

Health literacy is about a patient knowing why and what to do about his health status. It is the capacity to obtain process and understand health information and services needed to make appropriate changes10. It includes the ability to understand instructions on prescriptions, drug bottles, appointment slips, medical education brochures, doctor's directions and consent forms, and the ability to negotiate complex health care environment. It demands that a patient be able to evaluate information given to him for credibility and quickly analyze relative risks and benefits; calculate dosages, interpret test results and locate health information10 .Scott Anders through the use of visual aids was able to assist patients to understand the HbA1c and blood pressure levels as well as their management to treatment goals 11. Such a visual aid or communication technique has become necessary in our setting in order to achieve better compliance and treatment end points because drug literacy will go side by side with health literacy.

A 30 .8% compliance rate is far from satisfactory though it agrees with the general trend worldwide with its

accompanying consequences1, 9-13. Improved literacy level among the populace will in no doubt, improve their level of comprehension of not only prescribed drugs but also visual aids whenever it is introduced into the system. The positive association of education and general literacy on population health is well known7. Being health literate enables the patient to take responsibility of his or her own health and this is the essence of the partnership principle13.

CONCLUSION:
The study has demonstrated a higher drug compliance rate among individuals with tertiary level of education compared with

TABLE 1: DISTRIBUTION OF PATIENTS ACCORDING TO EDUCATIONAL LEVELS AND OCCUPATION, AND THE AVERAGE NUMBER OF DRUGS PRESCRIBED PER PATIENT IN EACH GROUP

OCCUPATION	LEVEL OF EDUCATION					AVERAGE NO OF DRUGS PER PATIENT
	0(n)	1^0(n)	2^0(n)	3^0(n)	**Total (n)**	(n)
Housewives	27	36	45	31	121	5
Traders	31	30	14	-	75	4
Mechanics	9	9	-	-	18	4
Drivers	11	-	-	-	11	5
Businessmen	16	13	14	33	76	4
Journalists	-	-	-	6	6	3
Nurses	-	-	-	45	45	5
Teachers	-	-	-	108	108	5
Engineers	-	-	-	27	27	4
Pharmacists	-	-	-	12	12	4
Lecturers	-	-	-	12	12	4
Lawyers	-	-	-	27	27	4
Doctors	-	-	-	15	15	3
OCS	18	23	12	32	135	4
Retirees	-	20	5	27	52	4
Clergy	-	-	-	27	27	5
Total	**112**	**131**	**90**	**437**	**770**	**-**

OCS=OTHER CIVIL SERVANTS;
1^0=primary 2^0 =secondary
3^0=tertiary

TABLE II: **THE COMPLIANCE RATE AMONG THE DIFFERENT EDUCATIONAL GROUPS (values are given as ± SEM)**

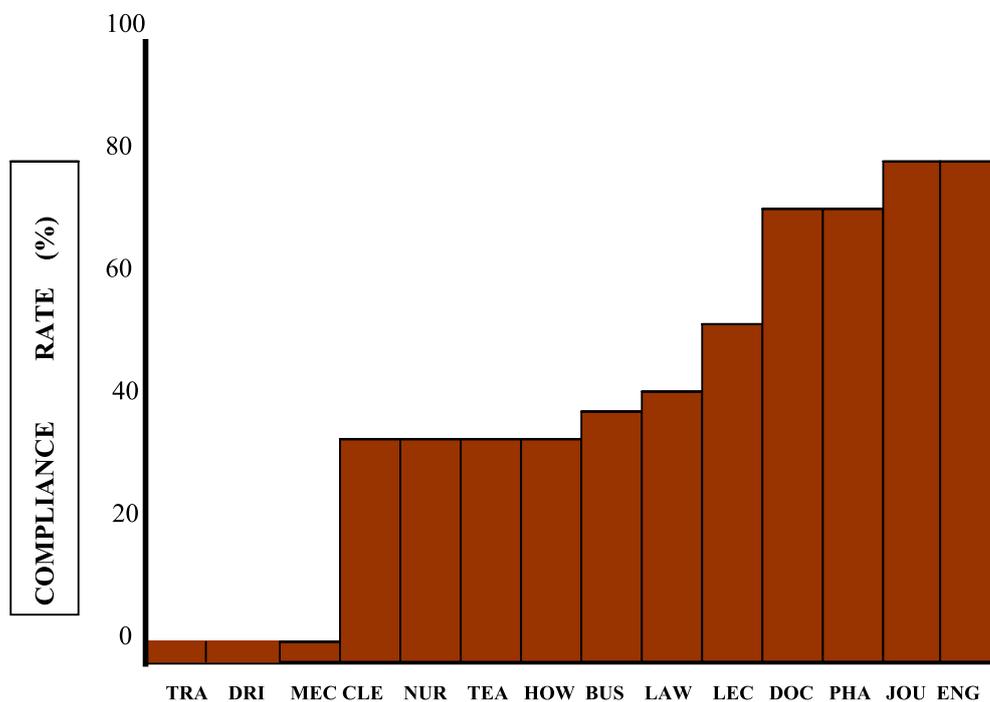| EDUCATIONAL LEVEL	NUMBER OF PATIENTS (n)	COMPLIANCE RATE (%)
a. ZERO	112	33.1± 5.5
b. PRIMARY	131	29.3 ± 5.0
c. SECONDARY	90	41.0± 5.3
d. TETIARY	437	67.9±2.0
e ALL MALES	430	31.8 ± 3.4
f. ALL FEMALES	340	28.3±2.3
g. ALL GROUPS(together)	770	30.8±4.3
P-VALUES a vs b =NS;	b vs c =<0.001;	c vs d=NS; e vs f=NS

NS= NOT SIGNIFICANT

Figure 1.   THE VARIATIONS IN COMPLIANCE RATE AMONG DIFFERENT OCCUPATIONAL GROUPS.

{TRA=trader; TEA=teacher; PEN=pensioner; NUR=nurses; MEC=mechanic OCS=other civil servants; LEC=lecturer; LAW=L=lawyer; JOU=journalists; HOW=housewives; ENG=engineers; DOC=doctors; DRI=drivers; CLE=clergy; BUS=businessmen; PHA=pharmacists}.

Fig 2. THE DIFFERENCES IN DEGREE OF KNOWLEDGE OF NAMES OF PRESCRIBED DRUGS AMONG DIFFERENT GROUPS OF PATIENTS.

{TRA=trader; TEA=teacher; PEN=pensioner; NUR=nurses; MEC=mechanic OCS=other civil servants; LEC=lecturer; LAW=L=lawyer; JOU=journaliists; HOW=housewives; ENG=engineers; DOC=doctors; DRI=drivers; CLE=clergy; BUS=businessmen; PHA=pharmacists}.
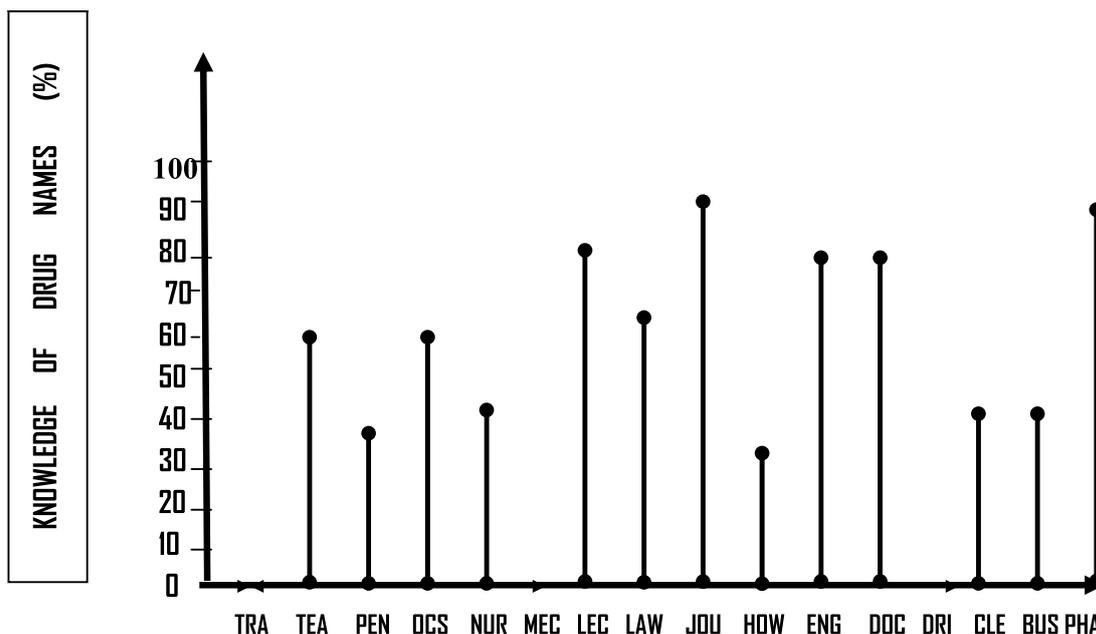
Table III: SPSS OUTPUT FOR MULTIPLE LINEAR REGGRESSION OF NUMBER OF PRESCRIBED DRUGS, PATIENT'S COMPLIANCE AND LEVEL OF EDUCATION

	Coefficients[a]						
	Unstandardized coefficients		Standardized coefficients			95% Confidence Interval for B	
Model	B	Standard error	Beta	t	Sig.	Lower Bound	Upper Bound
1(constant)	70.325	8.489		8.285	0.000	53.579	87.075
Number of Prescribed drugs	-5.882	-2.011	-0.210	-2.925	0.004	-9.849	-1.914
Level of Education	10.711	1.199	0.549	8.932	0.000	8.345	13.077

a. Dependent Variable: Patients compliance
Note: The values indicate the contributions of level of education and number of drugs per patient on the patient's compliance.
The Upper and Lower limits of the confidence intervals of the respective statistics are represented by the last two columns

Table IV:SPEARMAN'S CORRELATION OF RELATIONSHIPS BETWEEN
PATIENTS COMPLIANCE,NUMBER OF PRESCRIBED DRUGS PER PATIENT
AND PATIENTS LEVEL OF EDUCATION

CORRELATIONS

	Patients' compliance	No. of Drugs Prescribed per patient	Level of Education
Patients' compliance	1.000	-0.372**	0.451**
No. of drugs prescribed per patient		1.000	0.017
Level of education			1.000

**correlation is significant at p<0.01(2-tailed)

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