

Pharmacists' Activities in Improving Treatment Outcomes among Adult Hypertensive Patients visiting Health Facilities in NigeriaWINFRED A. OJIEABU^{1*}, YETUNDE T. AWOSILE¹, CHRISTABEL E. OJIEABU² AND LIONEL O. OKUNYE³¹*Department of Clinical Pharmacy and Biopharmacy, Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu Campus, Sagamu, Ogun State, Nigeria.*²*Obafemi Awolowo College of Health Science, Olabisi Onabanjo University, Sagamu Campus Sagamu, Ogun State, Nigeria.*³*Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu Campus, Sagamu, Ogun State, Nigeria.*

Adherence is key to improving patient outcomes especially in those with chronic disease states. We assessed activities of pharmacists to improve adherence in hypertensive patients. A hard copy data collection instrument was used to collect information from 402 patients. Information included demographics, medication adherence, pharmacists' activities in improving adherence and clinical outcomes. Google forms were used to collect data on demographics and activities done to improve patients' treatment outcome among 152 pharmacists. Data analysis was done using Statistical Package for Social Sciences version 23 and variables whose $P \leq 0.05$ were considered statistically significant. The mean age of patients was 53.71 ± 0.12 years. Majority felt they were taking too many medications (281, 69.9%) or they were taking too many doses (293, 72.9%). Pharmacists never asked 257 (63.9%) questions about their drugs. Many (244, 60.7%) forgot to take their medications routinely. The mean age of pharmacists was 27.72 ± 0.49 years and 132 (86.8%) had a B. Pharm Degree as their highest level of education, 69 (45.4%) had no updated information on patients' health, while 128 (84.2%) provided pharmaceutical patient care. Adherence to medications was poor especially among elderly patients. Patients agreed that pharmacists educated them on how their drugs work and on the right way to take their medicines. The main problem identified among pharmacists was their failure to update their clinical knowledge.

Keywords: Hypertensive patients, Pharmacists, Professional knowledge, Adherence, Clinical outcomes**INTRODUCTION**

Cardiovascular diseases (CVDs) such as hypertension are responsible for about 17 million deaths globally, as well as its complications resulting into about 7.5 million deaths [1]. An estimated 29% increase of adults in the world with hypertension is expected to arise in 2025 mainly from patients' inadequate knowledge of the disease coupled with lack of education, which usually result into medication non-adherence, higher morbidity as well as higher health care expenses [2]. It has been deduced that, Nigeria's contribution to the overall African burden of hypertension

prevalence definitely would be very high in the years ahead, taking into consideration her currently being the most populous African country [3], coupled with the high prevalence which is believed to be as a result of rapid urbanization, high adult population, increased consumption of processed foods, tobacco smoking and high alcohol intake [4].

The major problems hindering effective response to hypertension burden in Nigeria include low awareness, treatment and control [5], which in turn lead to many patients developing cardiovascular complications (such as heart failure, ischemic heart disease and

*Author to whom correspondence may be addressed. Email address: natbelpharmacy@gmail.com

stroke) and consequently ending up in health facilities [6]. With adequate patient education and monitoring, patients with chronic diseases such as hypertension and diabetes, could be taught and guided on how to make the best out of their medications including life style modifications. This has been substantiated in an earlier study [7]. Although collaborative patient management is very beneficial to both patients and health care professionals, there is no evidence of such happenings in Nigeria as at now. This study, therefore, aimed to assess the professional activities of pharmacists to improve adherence of hypertensive patients in Ogun state, Nigeria.

METHODS

Study design and setting

A descriptive cross-sectional study was employed where copies of a validated, pretested self-administered questionnaires adapted from a previous research [8] were administered to known hypertensive patients attending Olabisi Onabanjo University Teaching Hospital (OOUTH), a Public Health Care Facility situated at Sagamu, Ogun State, South Western Nigeria, between the period of July and September, 2020. In addition, a created Google form was sent to practicing pharmacists in Ogun state within the same period to collect needed information as enumerated above from both groups.

Study population

The study population comprised in and out-patient adult hypertensives and pharmacists in regular contact with hypertensive patients in both public hospitals and community pharmacy settings across Ogun state.

Sample size estimation

The minimum sample size for the patients was determined using Fisher's formula:

$$n = Z^2 P(1-P) \div (d^2)$$

where n = the targeted or estimated sample size, Z = the standard normal deviate, usually set at 1.96 which corresponds to 95% confidence, d = degree of accuracy designed or margin of sampling error acceptable, set at 0.05 and P = the proportion of the target population estimated to have a particular characteristic. Where there is no reasonable estimate, p is put at 50% (0.5). Therefore substituting the values, $n = Z^2 P(1-P) \div (d^2) = (1.96^2 \times 0.5 \times 0.5) / 0.05^2 = 384$ but this figure was eventually increased to 410 to cater for attrition and non-responders.

Study instrument

The questionnaire filled by the patients had the following sections: social demographics, assessment of patients' medication adherence and assessment of pharmacists' role in optimizing their adherence and clinical outcomes. Pharmacists filled a Google form comprising of these sections: social demographics, assessment of pharmacists' professional knowledge and their contributions to patients' treatment outcome.

Inclusion and exclusion criteria

All consenting registered pharmacists practicing across Ogun state at the time of the study were eligible to participate in the study while all non-consenting, non-registered pharmacists and non-pharmacists were excluded from the survey. Only adult hypertensive patients who gave their oral consent participated in the study.

Ethical consideration

The study protocol was submitted to the Health Research Ethical Committee of OOUTH, Sagamu, Ogun State, Nigeria. Approval was granted for this study by the committee (Approval No: OOUTH/HREC/322/2020AP). Informed consent was obtained from participating pharmacists and patients after giving them detailed information about the study. The participating pharmacists and patients were assured of the confidentiality of the data obtained from them.

Data analysis

Data were checked for completeness before being entered into Microsoft Excel for sorting into appropriate groups. Further analysis was carried out with Statistical Package for Social Sciences (SPSS) software, version 23 (Chicago, Illinois) using descriptive and comparative analyses. Comparison of proportions was carried out with Chi-square and Fisher's exact tests for bivariate analysis to test associations as appropriate. Values whose $P \leq 0.05$ were considered statistically significant.

RESULTS

Patients' perception of the pharmacists' activities

Out of the four hundred and ten (410) copies of questionnaire distributed to the hypertensive patients, four hundred and two (402) copies were returned and used for the analysis. Females were majority, 297 (73.9%) and 129 (32.1%) were aged between 50-59 years with an overall mean of 53.7 ± 0.12 , Primary school educational level respondents were 137 (34.1%) while 173 (43.0%) were self-employed (Table 1). Those taking more than 3 tablets daily were 188 (46.8%) and 281 (69.9%) felt they had too many drugs while 293 (72.9%) felt they were taking too many doses per day. Additionally, 244 (60.7%) of the patients forgot to take their drugs routinely, 215 (53.5%) perceived that the cost of drugs was high. Those who felt comfortable to ask their doctors questions were 194 (48.3%) while 257 (63.9%) said their pharmacists did not ask them questions about their drugs when they went for refilling of their prescriptions at the

pharmacy (Table 2). Patients' response on their knowledge of pharmacists' role in optimizing their adherence and clinical outcomes was neutral across board except in the areas of "educating them on how the drugs work, 274 (68.2%) and on the right way to take the drugs, 296 (73.6%)" that recorded satisfaction (Table 3).

Pharmacists' Activities in Management of Hypertensive Patients

One hundred and fifty two (152) copies of the created Google form were correctly filled and returned by the participating pharmacists. Majority 134 (88.2%) of the respondents were between the ages 21-30 years with an overall mean age of 27.72 ± 0.49 years. While about 132 (87%) of them had a B. Pharm degree as their highest level of education, 133 (87.5%) had practiced between 1-5 years (Table 4). Majority 69 (45.4%) of the respondents did not update information on the health of their patients, 136 (89.5%) dispensed multiple drugs as compared to single drugs. Majority, 136 (89.5%) agreed scrutinizing prescriptions before dispensing, 128 (84.2%) carried out pharmaceutical care often on the patients and 78 (51.3%) educated themselves often with the latest information on hypertension and its management (Table 5). On Pharmacist's rating of their contributions to patients' treatment, some found to be satisfied were analyzing patient's treatment and therapeutic regimens to optimize the health care provided, 98 (63.8%), educating patients on how medications work, 99 (65.1%), assessing adherence to patient's medications, 80 (52.6%) and counselling patients on medication adherence, 93 (61.8%) (Table 6).

Table 1: Socio-demographic characteristics of respondents (N=402 patients)

Variables	Frequency n (%)	Variables	Frequency n (%)
Gender		Age	
Male	105 (26.1)	< 50 years	99 (24.6)
Female	297 (73.9)	50-59 years	129 (32.1)
		60-69 years	103 (25.6)
Education		Above 70 years	71 (17.7)
No formal	41 (10.2)	Overall Mean	53.7±0.12
Primary	137 (34.1)	Occupation	
Secondary	128 (31.8)	Private	76 (18.9)
Tertiary	96 (23.9)	Public	79 (19.7)
		Self-employed (e.g. petty trading)	173 (43.0)
		Unemployed	74 (18.4)

Table 2: Perceptions of patients' on their medication (N=402)

Variable	Frequency n (%)	Variable	Frequency n (%)
How do you take your drugs?		Do you feel you are taking too many drugs?	
One tablet daily	45 (11.2)	Yes	281 (69.9)
2-3 tablets daily	169 (42.0)	No	95 (23.6)
> 3 tablets daily	188 (46.8)	Maybe	26 (6.5)
Do you feel you take too many doses per day?		Do you at times forget to take your drugs on routine days?	
Yes	293 (72.9)	Yes	244 (60.7)
No	109 (27.1)	No	137 (34.1)
Do you forget to take your drugs on non-routine days?		Maybe	21 (5.2)
Yes	279 (69.4)	Do you have a concern that your drugs are not helping you?	
No	104 (25.9)	Yes	80 (19.9)
Maybe	19 (4.7)	No	287 (71.4)
Do you feel you don't need these drugs?		Maybe	35 (8.7)
Yes	98 (24.4)	Have you had any side effects?	
No	269 (66.9)	Yes	102 (25.4)
Maybe	35 (8.7)	No	300 (74.6)
Are your drugs too costly?		How often do you miss a dose?	
Yes	215 (53.5)	Once in a week	164 (40.8)
No	145 (36.1)	Twice a week	151 (37.6)
Maybe	42 (10.4)	Once in a month	87 (21.6)
Do you feel comfortable to ask questions from your doctor?		Does the pharmacist ask you questions about your drugs when you go for refilling?	
Yes	194 (48.3)	Yes	123 (30.6)
No	177 (44.0)	No	257 (63.9)
Maybe	31 (7.7)	Maybe	22 (5.5)

Table 3: Patients' satisfaction by pharmacists activities (N=402)

Variable	Frequency n (%)	Variable	Frequency n (%)
How satisfied are you with the following on visiting your Pharmacist?			
Analyzing your treatments and therapeutic regimens to optimize your health care	Neutral= 301 (74.9) Satisfied= 86 (21.4) Very satisfied= 15 (3.7), P<0.001	Discussion of recommendations regarding your condition/s with your physician	Neutral= 330 (82.1) Satisfied= 57 (14.2) Very satisfied= 15 (3.7), P<0.001
Teamwork with the physician to optimize your treatment	Neutral= 334 (83.1) Satisfied= 51 (12.7) Very satisfied= 17 (4.2), P<0.001	Providing proper patient follow-up	Neutral =298 (74.1) Satisfied= 69 (17.2) Very satisfied= 35 (8.7), P<0.001
Delivering non-pharmacological therapy education	Neutral= 314 (78.1) Satisfied= 69 (17.2) Very satisfied= 19 (4.7), P<0.001	Educating you on your drug monitoring	Neutral= 334 (83.1) Satisfied= 51 (12.7) Very satisfied= 17 (4.2), P<0.001
Educating you on how your drugs work	Neutral= 101 (25.1) Satisfied= 274 (68.2) Very satisfied= 27 (6.7), P<0.001	Educating you on the right way to take your drugs	Neutral= 70 (17.4) Satisfied= 296 (73.6) Very satisfied= 36 (9.0), P<0.001
Educating you on adverse drug reactions and how to prevent it/manage it	Neutral= 260 (64.7) Satisfied= 133 (33.1) Very satisfied= 9 (2.2), P<0.001	Assessing your adherence to your drugs	Neutral= 312 (77.6) Satisfied= 71 (17.7) Very satisfied= 19 (4.7), P<0.001
Counselling you on drug adherence	Neutral= 260 (64.7) Satisfied= 133 (33.1) Very satisfied= 9 (2.2), P<0.001		

Table 4: Socio-demographic characteristics of Pharmacists (N=152)

Variable	Frequency n (%)	Variable	Frequency n (%)
Age		Highest level of education	
21-30 years	134 (88.2)	B. Pharm	132 (86.8)
31-40 years	9 (6.6)	M. Pharm	7 (4.6)
41-50 years	6 (3.9)	Pharm D.	10 (6.6)
Above 50 years	3 (2.0)	WAPCP	2 (1.3)
Overall Mean	27.72± 0.49	PhD	1 (0.7)
Practice area		Years of practice	
Hospital	74 (48.7)	1-5 years	133 (87.5)
Community	78 (51.3)	6-10 years	4 (2.0)
		11-15 years	3 (2.6)
		16-20 years	5 (3.3)
		Greater than 20 years	7 (4.6)

WAPCP= West African Postgraduate College of Pharmacists

Table 5: Pharmacists' Activities in optimizing therapy (N=152)

Variable	Frequency n (%)	Variable	Frequency n (%)
Do you have updated information on the health of your patients since you graduated?	Yes= 45 (29.6) No= 69 (45.4) Maybe= 38 (25.0) P=0.023	Can you say that you have a close relationship with your patients?	Yes= 89 (58.6) No= 37 (24.3) Maybe= 26 (17.1) P<0.001
Do you often dispense combination drugs rather than single drugs?	Yes= 136 (89.5) No= 16 (10.5) P<0.001	If yes, do you tell the patients reasons for doing so?	Yes= 120 (78.9) No= 24 (15.8) At times = 8(5.3) P<0.001
When you get prescriptions, do you revise them?	Yes= 136 (89.5) No= 7 (4.6) Maybe= 9 (5.9) P<0.001	Can you say that you carry out pharmaceutical care often on the hypertensive patients when they visit the pharmacy?	Yes= 128 (84.2) No= 9 (5.9) Maybe= 15 (9.9) P<0.001
On a scale of 1-10, how well do you interact well with patients?	1-4= 7(4.6) 5-8= 110 (72.4) 9-10= 35 (23.0) P<0.001	Do you often educate patients on the pharmacology of drugs prescribed to them?	Yes= 83 (54.6) No= 27 (17.8) Maybe= 42 (27.6) P<0.001
Do you always or often remind patients to take their drugs as they ought to?	Always= 90 (59.2) Often= 45 (29.6) At times= 17 (11.2) P<0.001	Do you often dispense self-monitoring devices to patients and teach them well how to use them?	Yes= 69 (45.4) No= 33 (21.7) At times= 50 (32.9) P=0.008
Do you often educate yourself on latest information on the disease condition (hypertension) and its management?	Always= 33 (21.7) Often= 78 (51.3) At times = 41 (27.0) P<0.001	Do you read journals on the disease condition (hypertension)?	Yes= 97 (63.8) No= 13 (8.6) At times= 42 (27.6) P<0.001
How often do you give patients compliance aids eg leaflets?	Always= 53 (34.9) At times= 78 (51.3) Rarely= 21 (13.8) P<0.001		

Table 6: Pharmacists' activities in improving treatment outcome (N=152)

Please, rate your contributions in these areas:			
Variable	Frequency n (%)	Variable	Frequency n (%)
Analyzing patient's treatment and therapeutic regimens to optimize the health care provided	Neutral= 30 (19.7) Satisfied= 98 (64.5) Very satisfied= 24 (15.8)	Discussion of recommendations regarding patients' condition/s with patients' physicians	Neutral= 62 (40.8) Satisfied= 75 (49.3) Very satisfied= 15 (9.9)
Teamwork with physicians to optimize patients' treatment outcome	Neutral= 64 (42.1) Satisfied= 68 (44.7) Very satisfied= 20 (13.2)	Providing proper patient follow-up	Neutral= 78 (51.3) Satisfied= 53 (34.9) Very satisfied= 21 (13.8)
Delivering non pharmacological therapy education to patients	Neutral= 67 (44.1) Satisfied= 49 (32.2) Very satisfied= 36 (23.7)	Educating patient's on drug monitoring	Neutral= 60 (39.5) Satisfied= 57 (37.5) Very satisfied= 35 (23.0)
Educating patients on how medications work	Neutral= 22 (14.5) Satisfied= 99 (65.1) Very satisfied= 31 (20.4)	Educating patients on the right way to take their medications	Neutral= 4 (2.6) Satisfied= 77 (50.7) Very satisfied= 71 (46.7)
Educating patients on adverse drug reactions and how to prevent it/manage them	Neutral= 72 (47.4) Satisfied= 47 (30.9) Very satisfied= 33 (21.7)	Assessing adherence to patient's medications	Neutral= 45 (29.6) Satisfied= 80 (52.6) Very satisfied= 27 (17.8)
Counseling patients on medication adherence	Neutral= 7 (4.6) Satisfied= 93 (61.2) Very satisfied= 52 (34.2)		

DISCUSSION

Hypertension was more prevalent among women respondents as compared to men which was contrary to one previous study [9]. Another study [10] found adherence to medications to be poor especially among elderly patients with chronic diseases and this is in agreement with our findings as our respondents said they do forget to take their medications at prescribed times. Elsewhere, a positive association between adherence to medication and age was reported as older patients were said to promptly use their medications more often following health care professionals' advice [11].

A great number of study patients said they felt comfortable to ask their doctors questions but their pharmacists did not ask them any questions. The implication of this may be that they were freer with their doctors because they prompted them to speak through questioning as compared with the inaction of their pharmacists. Pharmacists have numerous avenues and ample opportunities to engage patients on clinical conversations especially during the process of interview, education, drug reconciliation and counseling sessions to mention but a few. A previous study [12] found that pharmacists who endeavor to spend ample time with patients are

able to contribute to minimization of hypertension management cost in such patients.

As the age advances, many people suffer chronic disease states which definitely require continuous medications and lifestyle modification. This has been found to lead to medication non-adherence in such patients especially in asymptomatic disease states like hypertension and hyperlipidemia [13]. Chronic disease conditions should be treated optimally to prevent health deterioration and escalation of treatment costs. Thus adherence is a major concern in the management of chronic diseases as compared to management of acute diseases. According to an earlier study [13], patients living with chronic diseases need to be educated and counseled on the benefits of adherence to their medications. WHO defines adherence as “the extent to which a person follows agreed recommendations made with a healthcare provider as pertaining to use of his medications, diet, and observing lifestyle modifications [14].”

A positive relationship between patients' adherence to antihypertensives and a well-controlled blood pressure including CVDs has been established [15]. As far as adherence to medication and lifestyle modifications are concerned, it is of a great benefit for both the pharmacist and the patient to have adequate knowledge of the disease state. One major cause which has been found to affect adherence is lack of knowledge [16]. Sufficient knowledge of a particular disease could impact on patients' attitude and understanding in the management of such conditions. This means the pharmacist as the educator would need to assess the patient's knowledge base before the education and counseling sessions. An earlier study [17] suggested that provision of adequate information on hypertension, its complications and other vital information could inform an attitudinal change among hypertensive patients toward medication adherence. Reasons for non-adherence among study respondents could be traced to the fact that majority were of primary level educational status, self-employed (such as petty traders) as well as taking more than three medications daily. These reasons have been reported elsewhere [11, 18].

Many hypertensive patients may not want to take their medications or change their lifestyles due to lack of knowledge or the nature of the disease especially its asymptomatic manifestations. This was observed in this study where respondents felt they were taking too many medications, too many doses per day, at increased cost to them and therefore decided to be missing a dose at least every week. This is in agreement with a previous study [19] which reported non-adherence in patients to be intentional (such as refusing to take prescribed drugs and doses or wrong timings) or unintentional (including mere forgetfulness or inability to purchase the prescribed drugs). In line with health belief model, the way an individual perceives a disease condition and the ability to adopt a positive attitude will depend on the perceived seriousness of the following: the disease, susceptibility to the disease, benefits of positive attitude and barriers that stop the individuals from effecting the positive changes [20].

The pharmacists who participated in this survey were relatively young. This could have led to the expectation that majority of them had been taught and grounded in pharmaceutical care (PC) activities. The main problem identified among these pharmacists was their failure to update their knowledge with the current practice of pharmaceutical care, which exposes pharmacists to their responsibilities in patient care. At the time of this research, many pharmacists had a B.Pharm. as their highest qualification although majority of them had practiced for between 1-5 years. Comparison of patients' responses with the pharmacists' showed that the pharmaceutical care practice of these pharmacists did not have much impact on the patients as they indicated that the pharmacists maintained neutral positions in all their professional duties towards them except in the areas of 'educating them on how medications work and on the right way to take medications'.

Patient education and counseling is very important in disease management as it increases the patient's understanding of the nature, signs, treatment, prevention and amelioration of the disease. It also provides room for clarifications

of issues including the need for adherence to medications and lifestyle modifications. Previous studies buttressed these as interventions being used in modifying the beliefs and attitudes that have led to behavioral changes in the populace [21-22].

Although evidence has demonstrated great benefits to patients from pharmacists' patient focused educational and counseling activities [23], assessment of health professionals' roles in improving hypertensive patients' adherence to medications found that both the pharmacists and the physicians were not doing enough to improve patient education [24]. In many developed countries, pharmacists are adequately involved in pharmaceutical care activities [25] but in developing countries like Nigeria, they are barely involved in ward rounds with other health professionals in the areas of patients' progress, drug-related matters as well as medication therapy management plans [26]. It is of note that various studies to assess the value of the pharmacist's active involvement on the health care team have always led to improved control of hypertension and drug therapy management [27]. However, some studies found collaborative health care among health professionals as the most effective way to bring about improved blood pressure control in hypertensive patients [28-29]. There is need for all health care professionals, especially those involved in chronic disease management in patients to work together for maximum benefit to patients.

The lack of physical contact between the investigators and the respondent pharmacists was a major limitation as there was no opportunity for verbal interactions. Another limitation was that majority of patient respondents needed interpretations of their questions for proper understanding.

CONCLUSION

The study findings indicated that Nigerian pharmacists are not performing optimally to enhance patient treatment outcomes. Nigerian pharmacists should, therefore, be encouraged to receive more training in the area of chronic disease state management with emphasis on

patient adherence enhancement. This could translate to adequate patient education and better patient outcomes. Further research is required to evaluate the impact of hypertensive patient education on treatment outcomes.

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