Research Article

Assessment of pharmaceutical care services provided to HIV infected patients on antiretroviral therapy in Rivers state, Nigeria

Arloe ThankGod[1], Ismail A Suleiman[2*], Tolulope O Aremu[2]

[1] Niger Delta University, Bayelsa State, Nigeria
[2] Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, Federal University Oye-Ekiti, Ekiti State, Nigeria

ABSTRACT

Pharmaceutical care of HIV infected persons on antiretroviral therapy is pertinent in optimal management to achieve viral suppression and improve immune status. The objective of the study was to assess pharmaceutical care services provided to HIV infected patients on antiretroviral therapy. A prospective, cross-sectional study was carried out among 217 pharmacists giving pharmaceutical care services to HIV positive patients in Rivers State, Nigeria. Data collection tool was a structured, pre-tested questionnaire used to assess pharmaceutical care services carried out by pharmacists. The data collected were analyzed using SPSS version 20 and Microsoft Excel. Most of the respondents were female (62.8%). More than half (59.9%) of the subjects involved in provision of pharmaceutical care to HIV infected patients were practicing in the hospital setting. Most respondents (77.8%) did not monitor for drug therapy problems (DTPs), while most (89.9%) did not document interventions to identified drug therapy problems. Majority of respondents (90.3%) established rapport with patients to improve adherence. Most respondents (72.5%) had regular supply of antiretroviral drugs in their health facility. Pharmaceutical care services rendered to HIV infected patients on antiretroviral therapy was sub-optimal. Identification of DTPs and respective interventions, involvement in general patient management, and documentation of activities were the most affected.

Keywords:
Pharmaceutical care, HIV, Adherence, Antiretroviral therapy, Drug therapy problems

1. INTRODUCTION

Pharmaceutical care (PC) is defined as 'the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life'[1]. PC is a patient-centered, outcome-oriented pharmacy practice that aims to optimize the patients' health-related quality of life and also targets achieving positive outcomes with realistic economic expenses[2].

Pharmaceutical care services include obtaining medication history of patients, educating patients, counselling them on drug adherence, monitoring their response to drug therapy, identifying drug-related problems, documentation of all interventions, making therapeutic decisions and formulary choices[3]. PC is a major activity within healthcare systems, and is a structured, systematic and documented form of pharmacy practice that comprises the detection, prevention and solution to drug-related problems[2].

Human Immunodeficiency Virus (HIV) infection remains a major public health challenge. There were an estimated 37.7 million people living with HIV worldwide in 2020, with 4.7 million living in Western and Central Africa[4]. The UNAIDS 2020 Country progress report for Nigeria reported that with regards to global HIV burden, Nigeria ranked fourth, with an estimated 1.8 million people living with HIV and an estimated HIV prevalence of 1.3% among 15-49 years[5].

Antiretroviral therapy (ART) has revolutionized management of people living with HIV (PLHIV) by

*Corresponding author:
*Ismail A. Suleiman Email: ismail.suleiman@fuoye.edu.ng

reducing their morbidity and mortality. Adherence to ART plays an important role in this process, with a minimum of 95% adherence being required for optimal management[6].

Pharmacists are qualified to provide a broad range of pharmaceutical care services to HIV infected patients such as medication therapy management, transition of care, patient retention, acute HIV treatment, pre-exposure prophylaxis (PrEP), adherence monitoring, and patient education[7].

There are many studies on impact of PC on patient outcomes in sub-Saharan Africa[8-10]. In Nigeria, there are several studies on PC activities[11-13], whereas studies assessing pharmaceutical care services provided to HIV infected persons are limited.

The aim of the study was to assess the pharmaceutical care services provided to HIV infected patients in Rivers State, Nigeria.

2. MATERIALS AND METHODS

2.1. Study design and study setting

A cross sectional study carried out among pharmacists in the 23 Local Government Areas (LGAs) of Rivers State. Rivers State, in South-South geopolitical region of Nigeria is bounded by Anambra and Imo States on the north, Abia and Akwa Ibom States on the East, and Bayelsa and Delta States on the west. It has an area of 11,077 km^2 and an estimated population of 5,185,716[14]. Rivers State, with a HIV prevalence rate of about 3.6% has one of the highest HIV prevalence rates in Nigeria[15]. HIV care is accessed from the various hospitals and designated community pharmacies across the state.

2.2. Study population

All pharmacists in the State who directly provide services to HIV/AIDS patients on antiretroviral drugs and met the inclusion criteria.

2.3. Inclusion and exclusion criteria

Inclusion criteria were consenting pharmacists involved in providing pharmaceutical care to HIV infected patients (public health, hospital/clinic and community pharmacists) in the state. Excluded from the study were pharmacists who were not directly involved in pharmaceutical care services to HIV infected patients on antiretroviral drugs in Rivers State.

2.4. Sample size determination and sampling technique

Charan and Biswas[16] sample size formula was used to determine the required minimum sample size.

$$\text{Sample size} = \frac{(Z_{1}\text{-x}/_2)^2\, P\,(1\text{-P})}{d^2}$$

Where; $= Z_{1}\text{-x}/_2 =$ Standard normal variable. In majority of the studies, *P* value are considered significant below 0.05, hence, 1.96 is for the formula.

P = Expected proportion of population based on previous studies or pilot studies.

D = absolute error or precision-has to be decided by the researcher.

Sample size of 196 was obtained. Excess is usually distributed to give room for attrition, thus 218 questionnaires were distributed.

2.5. Data Collection and Analysis

The data collection tool was a questionnaire which was initially pretested by administering 20 copies to subjects similar to the intended ones (but excluded from the main study). Their responses were then analyzed and appropriate adjustments made. The questionnaire was then administered to pharmacists responsible for rendering pharmaceutical care services to HIV/AIDS patients in Rivers State. Out of 218 questionnaires distributed between June and August 2017, a total of 207 questionnaires were returned by the respondents giving 95% response rate.

The questionnaire used consisted of two (2) sections. The first section consisted of the demographic data of the respondents, while the second section consisted of questions on various aspects of pharmaceutical care services with regard to HIV infected patients which include:

1. Identifying drug therapy problems, the interventions carried out and document the pharmaceutical care service provided.
2. Pharmacists' involvement in ensuring that patients adhere to their medications, pharmacy appointments and counsel patients on adherence to their medications.
3. The involvement of pharmacists in HIV prevention education
4. The involvement of pharmacists in general HIV positive patients' management.

Data collected were analysed using Microsoft excel and SPSS version 20, then presented using descriptive statistics.

3. RESULTS

3.1. Demographic characteristics of pharmacists involved in pharmaceutical care of HIV infected patients

Out of 218 questionnaires distributed, a total of 207 (95.0% response rate) were retrieved. Most of the respondents were female, 130 (62.8%) compared to 77 male pharmacists (37.2%). Majority 59.9% of the subjects involved in provision of pharmaceutical care to HIV/AIDS

Table 1. Demographic characteristics of pharmacists involved in pharmaceutical care of HIV infected patients.

Variable	Option	Frequency	%
Area of Practice	Hospital Pharmacist	124	59.90
	Community Pharmacist	52	25.10
	Public health pharmacists	30	14.50
	Administrative Pharmacist	1	0.48
Gender	Male	77	37.20
	Female	130	62.80
Highest Educational Qualification	B. Pharm	175	84.50
	Pharm. D	20	9.70
	M. Pharm	10	4.80

Table 2. Identification, intervention and documentation of drug therapy problems.

Variables	Frequency	
	Yes (%)	No (%)
Identification and Intervention		
Assess patient's intolerance and adverse effects	175 (84.5)	32 (15.5)
Treatment of chronic complications	110 (53.1)	97 (46.9)
Monitor drug therapy problems	46 (22.2)	161 (77.8%)
Documentation		
Adverse effects observed/complained by the patients	18 (8.7%)	189 (91.3%)
Interventions to identified drug therapy problems	21 (10.1%)	186 (89.9%)
Every matter relating to patients medications	67 (32.4)	140 (67.6)
Document patients ARV drugs substitution/switch	46 (22.2%)	161 (77.8%)
Patients who defaulted their clinic appointment	53 (25.6%)	154 (74.4%)
Loss to follow-up patients	60 (28.9%)	147 (71.1%)
Document cases of death of patients on ARV drugs	178 (86.0%)	29 (14.0%)

patients are practicing in the hospital setting, followed by those in the community pharmacies 25.1%. The highest educational qualification of most pharma-cists (84.5%) who participated in the study was Bachelor of Pharmacy (B. Pharm.) degree, while just 9.7% had obtained Doctor of Pharmacy (Pharm. D.) degree as shown in Table 1.

3.2. Identification, intervention and documentation of Drug Therapy Problems (DTPs) by pharmacists

One hundred and seventy-five respondents (84.5%) assessed patients for side effects, while only 46 (22.2%) actively monitored for drug therapy problems. One hundred and eighty six respondents (89.9%) did not document interventions to identified drug therapy pro-blems. Only fifty three respondents (25.6%) documented patients who defaulted their clinic appointments while just sixty respondents (28.9%) documented 'loss to follow-up' patients as shown in Table 2.

3.3. Monitoring patient's adherence to their medications

Majority of respondents (87.0%) used inter-profes-sional approach in improving patients' adherence while only 9.7% did not create adequate rapport with their patients. Only about half of respondents (49.8%) assisted patients in setting reminders as to when to take their medication. These are presented in Figure 1.
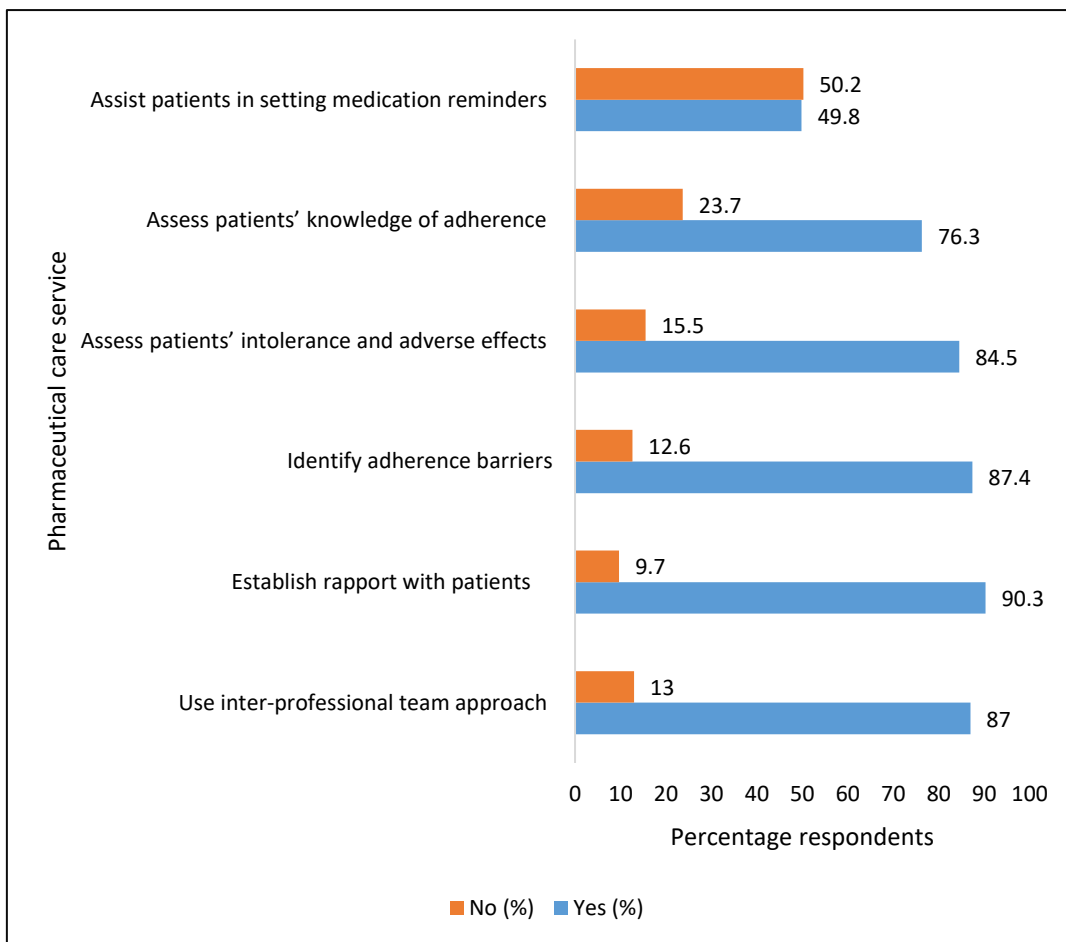
3.4. Involvement in HIV prevention education

Ninety three respondents (44.9%) reported that they provided ART education while one hundred and eight respondents (52.2%) reported actively advocated for screening of all blood prior to transfusion. Only 21.3% reported advocating consistent and correct use of condom as shown in Figure 2.

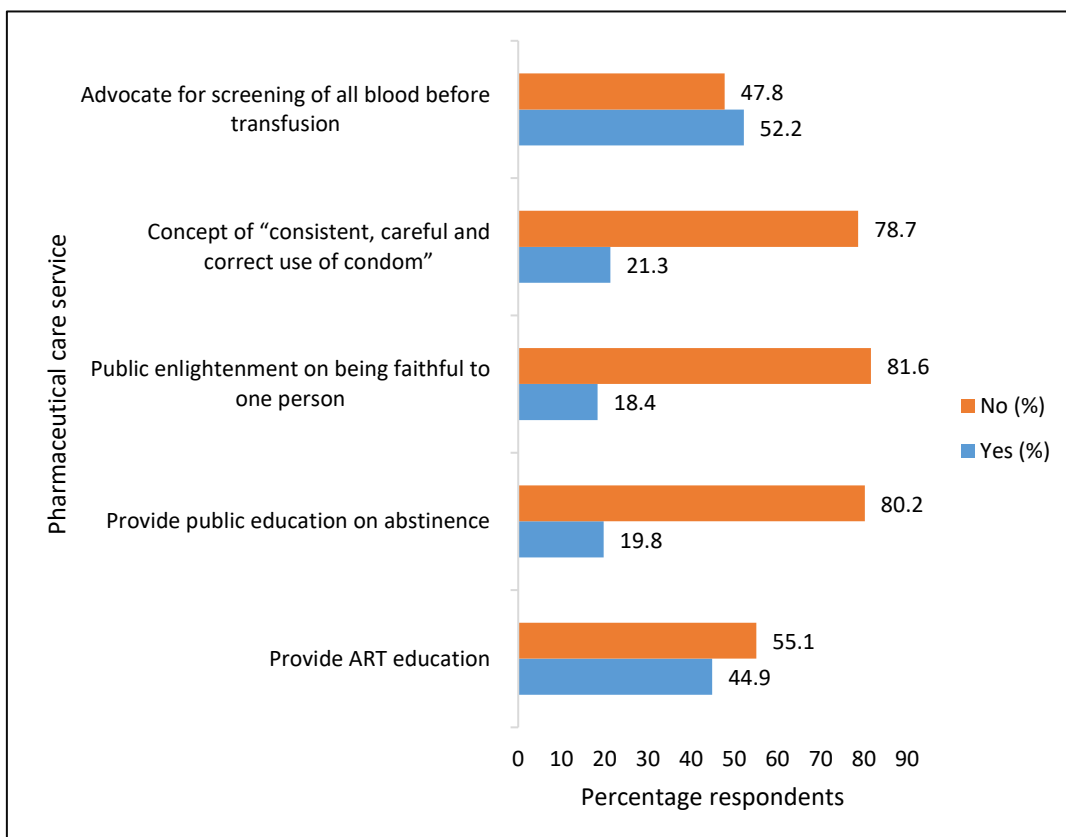### 3.5. Pharmacists involvement in general patients' management

Most respondents (66.2%) dispensed drugs for pre/post exposure prophylaxis and most (61.8%) provided mental health and social advice to patients. One hundred and fifty respondents (72.5%) reported that they had regular supply of ARV drugs in their facility. Almost all the respondents (94.7%) make enquiry about difficulty encountered by patients while taking their drugs. Details are as shown in Table 3.

4. DISCUSSION

The study showed that provision of PC services carried out by pharmacists was suboptimal, (although majority of the subjects were actively involved in adherence monitoring). This is corroborated in a review by Ogbonna et al., of assessment of pharmaceutical care studies in Nigeria based on the Oxford Centre for Evidence-Based Medicine level of evidence which

Figure 1. Pharmacist's involvement in monitoring patient's adherence to their medications.

Figure 2. Pharmacist's involvement in HIV prevention education.

Table 3. Pharmacists involvement in general patients management.

Variables	Frequency	
	Yes (%)	**No (%)**
Dispense drugs for pre/post exposure prophylaxis	137 (66.2%)	70 (33.8%)
Programs that can assist the patients' cost of health care	40 (19.3%)	167 (80.7%)
Recommend prophylaxis for opportunistic infections	27 (13.0%)	180 (87.0%)
Initiate patients on drugs for OI*	54 (26.1%)	153 (73.9%)
Carryout patients' ARV initiation	49 (23.7%)	158 (76.3%)
Provide mental health and social advice to patients	128 (61.8%)	79 (38.2%)
Actively involved in patient's co-morbidity management	77 (37.2%)	130 (62.8%)
Management of immigrants and refugee HIV patients	160 (77.3%)	47 (22.7%)
Actively involved in Management of HIV patients receiving organ transplant	177 (85.5)	30 (14.5%)
Involve patients in regimen selections and management	105 (50.7%)	102 (49.3%)
Have regular supply of ARV drugs in your facility	150 (72.5%)	57 (27.5%)
Ask questions related to the patients' job	22 (10.6%)	185 (89.4%)
Ask patients if they find it difficult in taking their drugs	11 (5.3%)	196 (94.7%)
Patient tracking to ensure patients are retained on care	91 (44.0%)	116 (56.0%)
Is there any referral site (Hospital) for your patients	110 (53.1%)	97 (46.9%)

*: Opportunistic Infection

showed that pharmaceutical care activities in Nigeria fell below the lower region of the benchmark, in contrast to studies in countries like USA and the United Kingdom where most of their studies fall within the upper region of the scale[17].

The provision of pharmaceutical care to HIV infected patients can take place in various practice settings such as hospitals and community pharmacies as well as those involved in public health/administrative activities. This corroborates ASHP Statement on PC, that PC is applicable and achievable by pharmacists in all practice settings. Thus, the provision of PC is not restricted to pharmacists in hospital or community pharmacy settings. Instead, it involves direct personal, professional, and responsible relationship with a patient to guarantee optimal medication use by the patient which leads to enhanced patient quality of life[2]. The study did not however, analyze pharmaceutical care services based on practice site (hospital, community, pharmacy etc.) as different settings allow different scope of practice. Further studies can identify challenges associated with pharmaceutical care service in different settings and compare the PC services carried out in each settings.

Documentation is a vital aspect of PC which is required for continuity of care, research reimbursement and evidence of action taken[12]. Most pharmacists in the study reported identifying drug therapy problems and followed up with suitable interventions which is similar to a study in Brazil by Schoenherr et al in which PC services were carried out with corresponding interventions[18]. However, only few respondents in this study documented drug therapy problems and their corresponding interventions. This is similar to a study carried out by Suleiman and Onaneye[12] in Ogun State, Nigeria in which neither the drug-related problems nor their interventions were documented and in another study by Nwafor et al[19] in community pharmacies in Anambra State, Nigeria in which most pharmacists rarely document their PC activities. It was also observed that most respondents did not document patients who defaulted their clinic appointment. Loss to follow-up patients are those patients who either died, no longer willing to continue care or have changed their contact etc. It is recommended that pharmacists should keep records of such patients. Most of the participants did not document "Loss to follow-up" Patients. ASHP states that one of the responsibilities of the pharmacist is to ensure that continuity of care is maintained when a patient moves from one component of healthcare to another[2].

Due to pharmacists' knowledge of the importance of adherence in ART therapy, majority of respondents assessed patients' knowledge of adherence while about half assisted patients to set reminders as to when to take their medication. In a study in Denver, Colorado, USA by Henderson et al.[20], which evaluated the impact of pharmacist-based adherence clinic on patients with adherence problems, there was an increase in mean adherence from 60% at baseline to 81% after pharmacist intervention ($p<0.0001$). The study also showed an increase in the proportion of patients with an undetectable viral load after intervention (58 % vs. 73%.), though this was not statistically significant. Due to pharmacists' detailed knowledge of drug-drug, drug-food and drug-disease state interaction and benefits of ART adherence, they are able to educate the patient and also identify barriers to adherence and how to overcome them[21]. In a Cochrane review by Haddad et al, pharmacist-led intervention (educational and counselling and follow-up) increased ART adherence and consequently virological outcomes[22]. In another review on ART, discontinuation, drug toxicity and intolerance were most frequent reasons (20-78%) for discontinuation[23]. Thus efforts should include support, counselling and management of ADRs during therapy

Most respondents reported adopting inter-professional team approach as a way to improve patients' adherence. Inter-professional team collaboration is when several health workers from various professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to achieve the highest quality of care[24].Research shows that when inter-professional team practice collaboratively, patient-centred care is enhanced and there is an improvement in patient and health systems outcomes[25-26]. Pharmacists have the ability to assess patients with virologic failure, evaluate reasons for failure such as non-adherence to ART and provide education on new antiretroviral regimens, thus they are an integral part of the multidisciplinary management of HIV positive patients[18]. Pharmacists have the ability to contribute to every component of HIV care. Their expertise in drug therapy and clinical skills makes for good and effective consultation with other members of the healthcare team[27].

Majority of respondents reported that they had regular supply of ARV drugs in their facility. Access to medication continues to be an issue for PLWH, and the success of medication therapy depends on access, with the pharmacist being in a prime position to ensure assess to ARV drugs[21].

5. CONCLUSION

Identification, intervention and documentation of drug therapy problems by pharmacists in the study was inadequate. There was good pharmacists' involvement in ensuring patients adhere to their ART regimen, while pharmacist involvement in patient education and general management was inadequate. Pharmacists should actively be involved in the identification, intervention and documentation of pharmaceutical care services provided to patients. They should also be actively involved in patient's education and counselling and ensuring patients adhere to their medications.

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