

Assessment of Role of Community Pharmacists in Management of HIV -infected Individuals in South-South Zone of Nigeria

Introduction: Over the past decade, there had been numerous advances in HIV therapy, with six drug classes comprising twenty- four individual antiretroviral agents now available. For patients who are adherent to therapy, and have undetectable viral load, HIV infection has become a chronic, manageable disease. Pharmacists' role has evolved and expanded to help patients and other healthcare providers to achieve the core goals of HIV management.

Objectives: this study assessed the role/services community pharmacists play/offer in the management of HIV patients in Rivers State, and evaluated the perception of community pharmacists towards management of HIV infected patients.

Method: A cross-sectional study was carried out among three hundred and seventy- four community pharmacist- owned pharmacies spread across Rivers State. Data were collected using pre-tested structured questionnaire. The structure comprises (1) demographic information (2) services offered to HIV infected patients (3) perception towards community pharmacists' involvement in management of HIV. Data analysis was done using SPSS version 16 and statistical significance was taken at $p < 0.05$.

Results: Out of 374 (100%) community pharmacist-owned pharmacies only 30 (8%) were involved in the management of HIV patients. 22(73.3%) were male and 8(26.7%) were female. While 23(76.7%) had B.Pharm degree, 2(6.7%) had PharmD. 18(70%) had 11 – 20yrs practice experience as 7(23%) had over 20yrs experience. 23(76.6%) had special HIV training program while 3(10%) self-acquired information on HIV. The services offered ranged from antiretroviral medication refill, counselling HIV patients on adherence to therapy, education on HIV disease, referral of patients for tests to monitor response to therapy, to decision-making as to when to switch therapy, and documentation of information on patients' medication history. No respondent offered HIV test services. 24(80%) counsel patients on adherence to therapy and educate them on HIV disease, but only 18(60%) document information on patients' medication history. 30(100%) offer medication refill services, but 15(50%) recommend switch in therapy when patient compliance is poor. The Likert scale to measure perception is biased towards agreement, Likert scale 3.89, that community pharmacists are knowledgeable and well positioned to play role in the management of HIV infected patients. There is no statistical difference ($p > 0.05$) in services offered with regard to gender, but there is a statistical difference in services offered based on level of training and practice experience among community pharmacists.

Conclusion: Very few 30(8%) of registered community pharmacists are involved in the management of HIV patients in Rivers State. Although the services offered cut across the guidelines for management of HIV infected patients, there is still need for improvement and regular update on HIV training for community pharmacists. These steps would help to involve more community pharmacists, decongest hospitals and reduce workload on hospital pharmacists.

Key Words: HIV patients, Community pharmacists, Services/roles, South- South Zone Nigeria

Introduction

The epidemic of human immunodeficiency virus (HIV) infection has changed dramatically since its initial recognition in 1981¹. Earlier in the epidemic, the incidence of HIV reached over 130,000 new cases per year, and deaths as a result of acquired immunodeficiency syndrome

(AIDS) was an almost certain prognosis for those infected². Significant advances in the strategies to prevent HIV transmission and in the medical care of patients with HIV infection led to significant reductions in both HIV transmission events and AIDS-related deaths over time. Among these advancements were: an understanding of HIV infection pathophysiology, identification of HIV transmission modes, development of public health interventions targeting behavioral changes in high risk populations, and identification of novel HIV medication targets, leading to advances in HIV treatment and eventually combination antiretroviral therapy (ART). Because the application of ART can significantly suppress HIV replication, thereby restoring a patient's immune function, it has resulted in a significant decline in HIV-related mortality. As a result, patients receiving long term therapy who maintain viral suppression can now manage their infection as a chronic illness and are likely to experience near normal life expectancy³.

While the annual incidence of AIDS and AIDS-related deaths initially declined after the introduction of ART in 1995, the annual numbers of new HIV infections, AIDS diagnoses, and AIDS-related deaths have remained constant since 2000⁴. From 2000 to 2011, there were 45,000 – 55,000 new cases of HIV infections diagnosed every year in United States and nearly 15,000 AIDS-related deaths annually. These statistics indicate that significant challenges remain for public health officials and HIV care providers to properly address the HIV epidemic. Furthermore, while long recognized challenges to successful HIV care remain relevant (e.g. lack of early diagnosis, inadequate linkage to and retention in care, poor adherence to ART, stigma and public perception, disparities in access to care for disenfranchised or socially marginalized populations) new challenges to successful HIV care and prevention are emerging (e.g. HIV in an ageing population, the application of novel prevention methods such as pre-exposure prophylaxis, the optimal timing of ART initiation, management of special patient populations with HIV infection^{5,6,7,4}. As the HIV epidemic evolves and new challenges to successful care and prevention emerge, healthcare providers, including pharmacists, are expanding their roles to ensure optimal patient care^{8,9}. Pharmacists have long been recognized as essential members of the HIV patient care team, and their involvement in managing HIV infected patients has been associated with improved outcomes. Pharmacists activities such as helping the team in selecting individualized HIV treatment regimens, providing patient counseling, monitoring for treatment responses and adverse effects, evaluating regimens for potential drug-drug interactions, and identifying opportunities for regimen simplification are associated with better viral load reductions and CD4+ T-lymphocytes responses, improved ART adherence, simpler regimens, and reductions in medication errors^{10,11,12,13,14}. To address emerging challenges, pharmacists will need to apply their traditional expertise within an interdisciplinary healthcare framework in multiple practice settings (inpatient, community, and ambulatory care) as well as identify and establish new roles in evolving area of care, including HIV testing and diagnosis, medication therapy management, transition of care, patient retention, acute HIV treatment, pre-exposure prophylaxis (PrEP) and initiation of ART in key populations such as those with acute opportunistic infections, hepatitis co-infections, and solid organ transplantation. In developing these roles, it's essential for pharmacists to remain highly engaged in the rapidly changing field of HIV using reliable resources such as <https://aidsinfo.nih.gov> ; the US Department of Health and Human Services (US DHHS) HIV management guidelines, as well as other resources.

Previous studies support the potential role that pharmacists can play in improving HIV self-management. In a meta-analysis of 14 randomized-controlled trials investigating the effect of pharmacists' intervention in patients with HIV across a number of countries, significant and clinically relevant improvements in glycemic control were observed¹⁵. Pharmacists' intervention

included non-pharmacological HIV education as well as pharmacological interventions such as medication counseling, adherence improvement strategies, avoidance of drug – drug interaction and medication adjustment (i.e. medication type and dosages). Traditionally, community pharmacists' services are accessed till extended working hours and without the restricted systems of hospital appointments. This is particularly valuable in parts of the world where multidisciplinary HIV care team are not yet well developed. HIV education and support professionals such as HIV nurses and educators are scarce in sub Saharan African region. In recent years, pharmacists' roles have expanded from simply packaging and dispensing medications to working with other healthcare professionals and the public. There is a large volume of published literature on the evolving role of community pharmacists in chronic disease management. The role of pharmacists in HIV management, including patient identification, assessment, education, referral, and monitoring, has been well established elsewhere in the world¹⁶. Given the ongoing evolution of HIV medicine, pharmacists must continue to evolve their roles as a part of the healthcare team to identify and meet the future needs of HIV infected patients. This goal can be achieved through continuous assessment of the role of HIV pharmacists, the development and maintenance of HIV specialty pharmacist training programs, and expert certification, and the continued collaboration with other healthcare providers, patients, activist groups, and professional HIV medicine and pharmacy organizations. Thus, this study aimed to assess the role/services community pharmacists play/offer in the management of HIV infected patients in Rivers State.

Method

Study area

The study was carried out in Port Harcourt, Rivers State. Port Harcourt is located in the South East of Nigeria, in the Niger delta region within the South – South geo- political Zone of Nigeria. Rivers State has been reported to have the highest HIV prevalence of all the 36 states in Nigeria. Within Port Harcourt there are two local government areas: Obio-Akpor and Port Harcourt City (Phalga). Three hundred and seventy-four (374) registered community pharmacies are spread across the two local government areas.

Sample size

All the registered pharmacists practicing within the community pharmacy in the State were the target population. At the time of this study, all the community pharmacists were targeted for the study. Preliminary investigation showed that of the 374 registered community pharmacies in Rivers State (record from Rivers State Ministry of Health), only 30 registered and licensed pharmacies manage HIV infected patients. This figure was also confirmed with a list obtained from the Association of Community Pharmacists of Nigeria (ACPN) Rivers State branch.

Thus, a total of 30 community pharmacies (Pharmacists) were recruited into this study.

Study design/data collection

The study was a cross-sectional study using structured questionnaire to collect relevant data from the community pharmacists within the study area. The questionnaire was structured into three parts: demographic data; services offered by the pharmacist; and perception questions relating to the services. Demographic data section includes: gender; year of practice; as well as educational qualification. The second part assessed services offered by the community pharmacist in the pharmacy, including medication refill, monitoring of patient's blood pressure and blood glucose level, education of patients on HIV disease, referral to laboratory for relevant tests, counseling on adherence to therapy, interpretation of test results, monitoring for adverse drug reaction, identification and referral for patients' failing therapy, referral for drug resistance testing,

documentation of patients' medication history, and assessment of potential drug interaction. The third part assessed community pharmacists' perception towards management of HIV patients in terms of knowledge base, position, and added value to both patient and the pharmacist. The Likert scale was used to analyze the perception of respondents towards HIV management. A total of 30 questionnaire were distributed and all retrieved

Data analysis

The data obtained were analyzed using statistical package for social sciences (SPSS) version 16, for both descriptive and inferential statistics. The statistical significance difference was taken at $p < 0.05$. Chi square was used for comparative analysis.

Results

Out of the three hundred and seventy- four (374) community pharmacies, only thirty (30) were involved in the management of HIV infected patients. All the thirty pharmacies are pharmacist-owned pharmacy. The thirty pharmacists in the pharmacies were targeted. The questionnaires were distributed accordingly to the pharmacists and retrieved. A 100% respond was recorded. The demographic data of the respondents is shown in Table 1. The data showed 22(73.3%) male and 8(26.7%) female. For years of practice experience, 10(33.3%) had 5 -10yrs experience while 5(16.7%) had more than 20yrs practice experience. Most of the pharmacists, 23(76.7%) had special HIV training program as the source of training experience for management of HIV infected patients while, 2(6.7%) got their training experience through mandatory continuing education program development (MCPD), and 3(10%) was through self- acquired information on HIV.

Table 1. Demographic data of Respondents (N = 30)

Variables	Frequency	Percentage
Gender		
Male	22	73.3%
Female	8	26.7%
Educational Qualification		
B. Pharm.	23	76.7%
Pharm D	2	6.7%
M.Sc.	5	16.6%
Years of practice experience		
<5 – 10yrs	5	16.7%
11 -15yrs	10	33.3%
16 – 20yrs	8	26.7%
>20yrs	7	23.3%
Source of training experience for HIV management		
Special HIV training program	23	76.6%
Attendance of seminar on HIV	2	6.7%
Self-acquired information on HIV	3	10%
MCPD Training	2	6.7%

The services offered by the community pharmacists to HIV infected patients are given in Table 2.

The result showed that all the respondents, 30(100%) offer medication to the patients. 24(80%) counsel the patients on adherence to their medications, while none was involved in HIV testing.

Table 2: Services offered to HIV patients by community pharmacists(N = 30)

Services	Frequency	Percentage
Medication refill	30	100%
Counsel on medication adherence	24	80%
HIV testing	0	0%
Education on HIV prevention/behavioral modification	12	40%
Referral to teststo monitor treatment progress	15	50%
Interpretation of test results to assess treatment response	16	53.3%
Documentation of patient’s medication history	18	60%
Blood pressure monitoring	30	100%
Blood glucose monitoring	12	40%

The different points at which community pharmacists recommends change/switch of regimen is shown in Table 3.

Table 3: Decision – making point to change /switch treatment regimen for HIV infected patients N = 30

Point of recommendation	Frequency	Percentage
Patient’s compliance is poor	15	50%
Observed drug resistance	17	56%
Patient cannot tolerate adverse drug reaction of regimen	28	93%
Viral load is increased	28	93%
CD4+ cell count is decreased	19	63%
Drug interaction with other medications in regimen	2	6.7%

The result showed that most respondents, 28(93%) recommend switch in treatment when patient cannot tolerate adverse drug reaction of the regimen and when the viral load is increased. Meanwhile, 15(50%) of the respondents recommend switch of treatment regimen when patient’s compliance is poor, but only 2(6.7%) recommend change of regimen when there is drug interaction with other medications in the regime.

The results of the respondents’ perception towards community pharmacists’ management of HIV patients is shown in Table 4, while Table 5 illustrated with Likert scale, values and group frequency on the sub -unit of the perception scale.

Table 4: Respondents’ Perception towards community pharmacists’ management of HIV infected patients N = 30

	Perception Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
A	Do you think community pharmacists should be involved in the management of HIV patients?	7	15	3	5	0

B	If your answer to A above is Yes, Why?					
	I. It enables wider coverage of management of HIV infected patients	2	22	3	3	0
	II. It provides opportunity for community pharmacists to make more money	2	10	12	4	0
	III. It provides HIV patients much more and easier access to HIV care	8	12	8	2	0
C	Do you think community pharmacists are well positioned to play role in management of HIV infected	8	16	6	0	0
D	Do you think community pharmacists are knowledgeable enough to manage HIV infected patients	5	18	7	0	0

The four perception questions represented with A, B, C, and D as shown in table 4 indicates diverse scores on a Likert scale as shown in Table 5. It was observed that none of the respondents strongly disagreed with the general statement on perception of community pharmacists' knowledge and positioning to manage HIV infected patients. The general trend on the Likert scale is biased towards 4 (agree). The tail end of the Likert scale i.e. 1 (strongly disagree) and 2 (disagree) had the least scores generally.

Table 5: Likert Scale values and corresponding frequencies of community pharmacists' perception on different perception sub scales

Likert scale	Value of response	Perception Sub scales				
		A	B	C	D	Sum
Strongly disagree	1	0	2	1	0	3
Disagree	2	5	3	0	0	8
Neutral	3	3	8	6	7	24
Agree	4	15	13	15	18	64
Strongly agree	5	7	4	8	5	24
Total (H)		30	30	30	30	
120						467

Average Likert scale value is calculated as follows: $H \div 1$

H = Sum of frequency of community pharmacists' response on each four sub unit score, ranging from strongly disagree to strongly agree, of the Likert scale.

I = The total sum of frequency of community pharmacists responding to a particular sub scale.

$$(3 \times 1) + (8 \times 2) + (24 \times 3) + (64 \times 4) + (24 \times 5) = 467$$

$$\text{Average Likert scale} = \frac{467}{120} = 3.89$$

120

120

The general trend on the Likert scale is a bias towards agreement (3.89 approximately 4) with the general statement on perception towards community pharmacists' management of HIV patients. Gender effect on the services offered to HIV infected patients by community pharmacists is shown in Fig. 1. The result showed that all the respondents both male and female refill medications for the patients. But more female offered other services, such as documentation of patients' medication history, referral to tests, education on HIV prevention, and counseling on medication adherence, than the male.

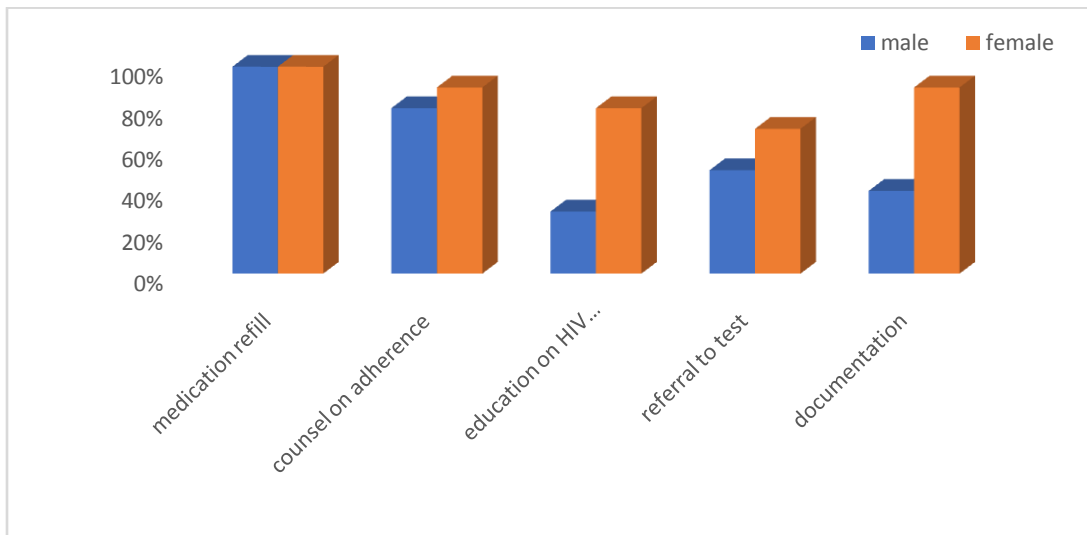


Fig. 1: Gender effect on services offered to HIV patients by community pharmacists

The result of effect of years of experience on the services offered to HIV infected patients by community pharmacists is given in Fig. 2.

Analysis of the results as shown in Table 6 and Table 7 indicate that there is no significant difference ($p > 0.05$) in the services offered by the various categories of community pharmacists with different years of practice experiences, as well as in gender difference. The overall services scores were classified as: (1) acceptable (when services offered is $\geq 75\%$), (2) partially acceptable (if services offered is within 60% - 74%, and unacceptable (if services $< 60\%$).

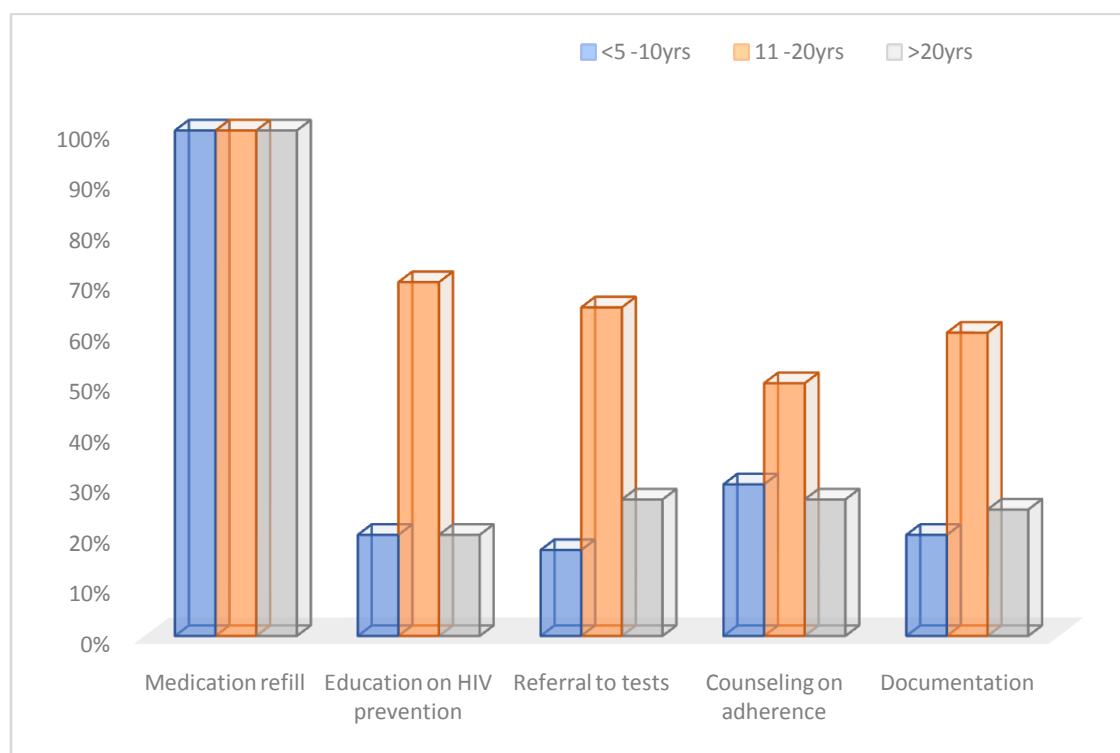


Fig.2: Effect of years of practice experience on the services offered to HIV patients by community pharmacists

Table 6: Analysis of results effect of gender on the overall services offered to HIV patients by community pharmacists

Gender	Acceptable	Partially Acceptable	Unacceptable	Total
Male	2	0	20	22
Female	4	1	3	8
Total	6	1	23	30

$p > 0.05$ ($X^2 = 3.986$)

Table 7: Analysis of results of effect of years of practice experience on the overall services offered to HIV by community pharmacists

Years of practice experience	Acceptable	Partially Acceptable	Unacceptable	Total
<5 – 10yrs (10)	1	0	9	10
11 – 20yrs (15)	1	1	13	15
>20yrs (5)	1	0	4	5
TOTAL	3	1	26	30

$p > 0.05$ ($X^2 = 3.886$)

Discussion

Only thirty community pharmacists -owned pharmacies out of three hundred and seventy -four registered pharmacies in Rivers State were involved in the management of HIV infected individuals despite the fact that pharmacists' involvement in the care of HIV infected individuals has been associated with improved patient outcomes^{10,11,12}. Although the services offered to HIV

infected patients by the community pharmacists, cut across the guidelines on the role of community pharmacists in caring for patients with HIV, this study identified that there is still need for improvement in almost all the areas of services offered. While all the respondents 30(100%) were involved in medication refill and blood pressure monitoring, only 15(50%) document information on patients' medication history. This may be attributed to lack of emphasis on the importance of documentation in the course of training.

Over the past decade, there has been numerous advances in HIV therapy, with 6 drug classes comprising 24 individual antiretroviral agents now available. Patients who are adherent with their therapy and who have undetectable viral load level, HIV has become a chronic, manageable disease in an aging and genetically diverse population. The core goals of management remain maximal suppression of viral replication and promotion of immune reconstitution through combination antiretroviral therapy. Secondary goals of therapy include promoting long term adherence, avoidance of drug interaction, minimizing toxic effects of drugs, simplifying treatment regimens, decreasing drug costs, managing co- morbid conditions, and preventing transmission of HIV by achieving undetectable viral load^{17,18}. Consequently, the pharmacist's role has evolved and expanded to help patients and other health care providers to achieve these goals. Pharmacists are recognized as established and integral members of HIV health care teams across Canada and United States¹⁹. Pharmacists' involvement in the care of HIV infected patients has been associated with improved patient outcomes, including enhanced adherence,¹⁰, reduced pill burden, and dosing frequency, greater increases in CD4 cell counts, higher rates of viral suppression,^{11,12}, and decreases in medication errors^{13,14}.

The current guideline points out pharmacist's role in the many aspects of caring for patients with HIV/AIDS, including selecting and reviewing therapy, tailoring treatment for specific populations, counseling patients, monitoring response to therapy guiding transition of care, and undertaking scholarly and professional activities. In this study, all the respondents were involved in the refill of antiretroviral medications for the patients. Most, 28(93%), exhibited good knowledge on decision -making point to change/switch treatment regimen, when patients cannot tolerate adverse drug reaction, and when viral load increases. This may be attributed to a good knowledge of drugs and disease pathophysiology. However, a good number, 15(50%), identified patients' poor compliance as a decision -making point to change regimen. Most treatment failures are the result of non- adherence, pharmacokinetic complications, and antiretroviral resistance. Pharmacists, especially those with specialized training in adherence assessment, interventions, and motivational interviewer, can help determine which of these reasons may have contributed to valid antiretroviral therapy failure. Many factors lead to non -adherence, including medication intolerance and adverse effects, depression, substance use, psychosocial factors, lack of social support, housing insecurity or homelessness, and patients' beliefs. The pharmacist should work with the patients to assess and resolve any barriers to antiretroviral adherence. Strategies for improving adherence include utilizing an inter- professional team approach, establishing a rapport with the patient, proactively identifying adherence barriers prior to regimen initiation, assessing patients for medication intolerance and adverse effects, providing mental health and social resources for the patients, assessing adherence at every pharmacy visit, involving the patient in regimen selection, providing adherence aids such as pill boxes and calendars, and assisting the patient in setting reminders through cell phone alerts or text messages²⁰. However, this study identified that 24(80%) of respondents counsel patients on medication adherence. This positive measure can certainly improve patient compliance to treatment regimen.

Perception of community pharmacists towards management of HIV infected patients: The result of this study showed that the average Likert scale value for respondents' perception towards community pharmacists' involvement in management of HIV infected patients was biased towards agreement, 3.89 (approximately 4). This finding agreed with previous studies^{21,22} where majority of community pharmacists showed positive disposition to use their premise, and willingness to extend access for differentiated HIV care²³. The result further confirmed the research reports that evaluated views of pharmacists and other stakeholders regarding integration of community pharmacies into primary care pathway²⁴. Community pharmacists occupy unique positions within the community such that accessibility and availability of health services can be assured. Community pharmacists as the most accessible healthcare professional to the public have been adjudged to be better positioned for early detection and management of chronic diseases together with other health care professional. Chronic diseases screening, counseling on the appropriate use of medicines, life style changes advocacy, working with other healthcare professionals and general provision of pharmaceutical care services to these patients are some of the identified areas where community pharmacists could help improve the quality of life patients with chronic diseases¹². HIV/AIDS is a chronic disease of concern because of its high morbidity and mortality. Early detection of HIV and timely initiation of antiretroviral therapy is crucial in achieving the vision of controlling the virus which will help prevent transmission and HIV/AIDS associated deaths²⁵. Achieving this primarily hinged on ensuring universal access to lifesaving medications and access to other HIV prevention services²⁶ including counseling and testing. Hence, the use of more peripheral health professional settings including community pharmacists could be optimally utilized to improve and enhance access to HIV care and services.

Association between demographic variables of respondents with Perception of community pharmacists; management of HIV infected patients: This study showed that considerable associations between services offered by community pharmacists and demographic variables such as gender, educational level, years of practice experience and source of training experience on HIV, exist. The study showed there is statistical difference in the services provided by respondents and level of education attained ($X^2 = 14.875$, $p = 0.005$) and source of training experience on HIV ($X^2 = 15.708$, $p = 0.005$). Generally, the respondents with special training on HIV management had significantly highest acceptable (87%) level of services offered. This further emphasizes the importance of special training for community pharmacists on HIV management. Guidelines and position statements on the role of the pharmacists in caring for patients with HIV/AIDS have been published by various national and international organizations^{8,9}. Thus the need for community pharmacists to update their knowledge on those guidelines will not be over emphasized. Furthermore, the result showed no statistical significance difference ($X^2 = 3.986$, $p > 0.05$) in the overall services offered by both male and female respondents. This may be attributed to the fact that neither the services nor the training is gender based.

Conclusion: The study identified that only thirty (30) community pharmacists out of three hundred and seventy-four (374) registered community pharmacists were involved in the management of HIV infected patients in Rivers State. The services offered by the community pharmacists cut across the guidelines, but there a great need for improvement. The perception of community pharmacists towards involvement in management of HIV infected patients is biased towards agreement that community pharmacists are well positioned, knowledgeable, and accessible to play role in management of HIV patients, and to give a wider coverage for

management of HIV patients. Pharmacists in particular are uniquely capable of contributing to all components of HIV care by being highly accessible to both patients and care providers in a variety of health care settings. Their expert drug therapy knowledge and clinical skills provide an avenue for proficient clinical consultation with other health care providers as well as effective patient interactions through counseling and education.

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