EC PHARMACOLOGY AND TOXICOLOGY Review Article Pharmaceutical Care Activities in Nigeria from 1970 to 2018: A Nar...

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Pharmaceutical Care Activities in Nigeria from 1970 to 2018: A Narrative Review

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Abstract

Background: Over the past four to five decades many studies have revealed the high prevalence of experimental and non-experimental studies in developed countries. However, the state of Pharmaceutical care PC studies remains largely unknown in Nigeria. Pharmaceutical care practice has undergone developmental changes over the years in different countries with series of evidence based studies. However, in Nigeria, the quality and extent of the practice and studies remain largely unknown. Over the past four to five decades many studies have revealed the high prevalence of experimental and non-experimental studies in developed countries. However, the state of pharmaceutical care (PC) studies remains largely unknown in Nigeria.

Objectives: This study described pharmaceutical care studies in Nigeria and documented information for interventions, planning and policy.

Methods: The study utilized narrative review to describe the state of PC studies in Nigeria. The study was synthesized from retrieved literatures obtained from the search of computerized data bases with search term used individually, in series and using truncation where necessary. Only studies carried out in Nigeria and published in English Language from January 1970 to September, 2018 were used. Data obtained were matched with two bench marks for assessment of study standards and hierarchy of clinical studies. Data was summarized using descriptive statistics of frequency and percentage. The study lasted from March to October 2018.

Results: Overall, 38 articles were selected from a total of 2124 which gave rise to 1.8% selection of eligible articles. All the articles fell below the 3rd position on the 8points Oxford Center for Evidence- Based Medicine Scale (OCEMS). The south west had the highest distribution of PC studies 18.0 (47.4%), followed by south east 10.0 (26.3%) and north central 5.0 (13.2%). Studies hierarchy fell within the last three stages of 6 points Scottish Intercollegiate Guideline Network Scale (SIGNS) for hierarchy of study types.

Conclusion: PC activities in Nigeria felled within the lower half of two standard benchmarks for hierarchy of study types. Most of the studies were predominantly carried out in the western and eastern part of Nigeria. Randomized Control Trials (RCTs), narrative reviews, systematic review and meta-analysis of RCTs of PC studies were still not available in the country.

Keywords: Pharmaceutical Care; Review; Clinical Studies; Nigeria; Outcomes; Pharmacotherapy

Abbreviations

PharmD: Doctor of Pharmacy; RCTs: Randomized Controlled Trials; PC: Pharmaceutical Care; EMBASE: Excerpta Medica Database

Introduction

Pharmaceutical care was first defined as, "the care that a patient requires and receives that assures safe and rational use of medicines" in 1975 [1]. In 1980, the holistic dimension of addressing drug therapy need alongside other professional services was added [2]. The philosophy and practice was added from 1988 to 1990. However, the missing qualitative and quantitative aspect of pharmaceutical care which makes the pharmacist to take responsibility for patients drug therapy needs was added to the concept as recorded in 1998 [3]. This concept started in the United States in the 1980s and 1990s to other parts of the world [4-7]. Many studies have indicated the positive impact of pharmaceutical care in improving patients' clinical, economic and humanistic outcomes in America, Europe and Asia [8-11]. In Africa, studies abound in on the impact of pharmaceutical care on patients outcomes especially [12-13]. Experimental and non-experimental studies have recorded PC activities and its impact in diseases states [14-17]. In Nigeria, studies abound on the activities of PC [18-26]. However, no review studies (narrative, systematic or meta-analysis) was sited or published to assess the extent of pharmaceutical care activities in Nigeria. This study filled this gap by articulating the pharmaceutical care studies in Nigeria to understand and document the extent of practices and services.

There has been no published review article on the nature and extent of pharmaceutical care activities and studies in Nigeria [27-29]. Studies abound on the limitations to PC practice in Nigeria but no review studies, RCTs of PC interventions, systematic review and meta-analysis of PC studies or RCTs, or narrative review have been cited. Hence, we cannot tell the progress being made so far in implementing pharmaceutical care and the nature and trend of studies obtainable presently in Nigeria in driving the frontier. This study serves as a link between the past, present, and future of pharmaceutical care activities and studies in Nigeria. It revealed what has been done already, the extent of the practice and studies, and provided the direction for improvement on the nature and extent of practice and studies. It addressed statement of question with reference to participants, interventions; comparisons, outcomes, and study design (PICOS Approach). The study will serve as audit trail required for regular improvement on previous studies which is essential in standardization of PC activities. Without periodic reviews, it might be difficult to understand if any progress is being made at all, and the focus of PC studies in the country. The study described pharmaceutical care studies in Nigeria and provided an overview of the pharmaceutical care activities, gave an understand of the studies, extent and nature of work done, described the PC activities, made comparisons with Oxford and Scottish benchmarks for hierarchy of clinical studies and documented information for interventions, planning, and policy.

Methods

Study area

The study covered pharmaceutical care studies originally carried out in Nigeria.

Review question

What is the extent of pharmaceutical care development and nature of studies in Nigeria?

Study population and type of studies included

All pharmaceutical studies that passed the inclusion criteria and published in MEDLINE, and EMBASE were utilized. A secondary search was carried out on Google Scholar and manual search was conducted for studies that met the inclusion criteria. This ensured retrieval of relevant studies while focusing on the study objectives.

Eligibility criteria

- Studies published in English language
- Peer-reviewed papers were eligible for inclusion
- Pharmaceutical care studies conducted in Nigeria irrespective of the region
- Studies with defined protocol and study design either experimental or non experimental
- Studies with no conflict of interest stated
- Studies that provided other information that may help to understand pharmaceutical care
- Studies with clearly stated and defined research design.

Eligibility criteria

- Studies without clearly defined period, duration, sample size and location were discarded
- Studies with methodological flaws
- Studies with incomplete data.

Study design

The study was a narrative overview of pharmaceutical care studies and activities in Nigeria.

Risk of Bias

The included studies were assessed for subjects and sampling selection bias, reporting bias before selection.

Information source

Search was conducted using Ovid MEDLINE, Ovid EMBASE, and PubMed.

Condition and Domain studied

Pharmaceutical care studies and articles that described pharmaceutical care activities in Nigeria.

Drug utilization, disease state management, traction study and data extraction was done in accordance with the standard reporting protocol for narrative reviews [29].

Data items and Summary Measures

Data were sought for study location, design, sample size, year of publication, inclusion criteria, exclusion criteria, year of publication, study instrument, title of publication, level of evidence, and hierarchy of studies. All the articles that met the inclusion criteria irrespective of their year of publication were selected.

Context

The study covered original pharmaceutical care studies carried out in Nigeria.

Articles search process

EMBASE, MEDLINE (PubMed) and Google Scholar was searched for studies and articles on pharmaceutical care in Nigeria published between 1980 and 2018 [30]. The search strategy and terms was carried out as presented in figure 1 shown below. The primary concept and theme were used individually, in strings/series, and truncated where necessary during articles search. Additional words found appropriate and relevant to the title and objective of the study were utilized. A total of 2124 articles were obtained, 98 from EMBASE and 1622 came from MEDLINE and 404 articles from Goggle Scholar (secondary search). These articles were assessed for eligibility based on the inclusion criteria.

Study period and duration

The study lasted from March to September, 2018 and covered peer reviewed articles published from January 1970 to September, 2018.

Ethical approval

Ethical approval is not applicable here. However, only studies with ethical approval were included and utilized in the review process.

Data analysis

Data was summarized with descriptive statistics.

Study articles selection process

A total of 2124 articles were obtained, 98 from EMBASE and 1622 came from MEDLINE and 404 articles from Goggle Scholar and secondary search. These articles were assessed for eligibility based on the inclusion criteria. Overall, 1715 studies which felled outside the scope of pharmaceutical care were discarded giving rise to 409 articles. On further screening, 312 articles with invalid and incomplete study design were eliminated, and another 59 articles with incomplete follow up data which gave rise to 38 studies used for the review.

Data extraction instrument, pilot testing and data extraction process

The data extraction instrument was designed by examining the articles, writing out all the key data represented and eliminating the irrelevant ones based on the study objectives and title. The remaining data were harnessed into one extraction sheet and was pilot tested for face and content validation using five articles which were not included in the study. Further modifications like arrangement of the data items logically and designing of the sheet into appropriate table format were made to obtain the final instrument. The instrument was given to an independent assessor to critique by using it on two independent studies before it was used for data collection.
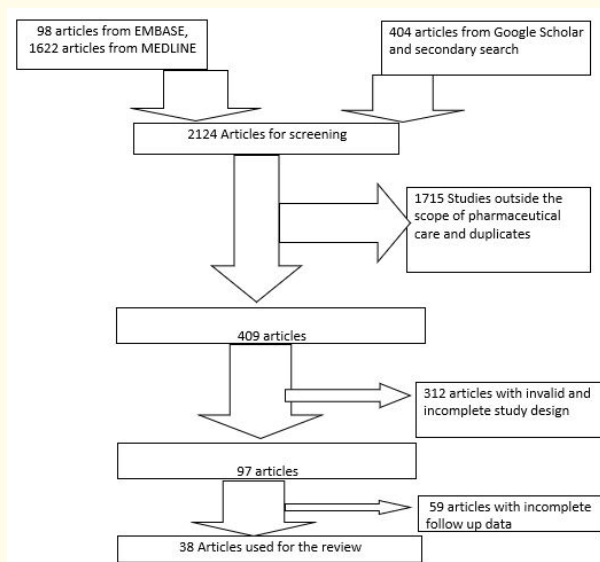
Flow Chart of study process

Figure 1: Flow chat of the study articles selection process.

Results

Reference	Title	Location	Design	Year of publication	Sample size	Inclusion	Exclusion	Study instrument
[31]	Prescription audit in a pediatric sickle cell clinic in south west Nigeria: A cross sectional retrospective study	South west	Cross sectional retrospective study	2017	202 patients	Medical records of sickle cell patients below 18 years	Medical records with incomplete data	Medical record and prescriptions
[28]	Limitations to the dynamics of pharmaceutical care practice among community pharmacists in Enugu urban, southeast Nigeria	Southeast	Cross sectional study	2015	76	Registered community pharmacists	Registered community pharmacies with less than one year of practice	Questionnaire
[27]	Barriers to implementation of pharmaceutical care in Nsukka and Enugu metropolis of Enugu State	Southeast	Cross sectional descriptive study	2012	80	Registered community and hospital pharmacists	Unregistered community and hospital pharmacists	Semi structured questionnaire
[32]	Expanding HIV/AIDS care service sites: a cross sectional community pharmacists view in southeast Nigeria	Southeast	Cross sectional descriptive study	2017	205	Registered community pharmacists	Registered community pharmacist who did not give their informed consent	Self-administered structured questionnaire
[33]	Prescribing pattern and antibiotic use for hospitalized children in a northern Nigeria teaching hospital	North	24 months descriptive retrospective survey	2015	3908	Pediatric inpatients	Pediatric outpatients	Patients folders and prescriptions
[34]	Pharmaceutical care and medication adherence in management of psychosis in a Nigerian tertiary hospital	Northeast	Cross sectional study	2013	231	Schizophrenic patients who have been on antipsychotics for at least one year and above 16 years	Schizophrenic patients who have been on antipsychotics for less than one year and below 16 years	Structured questionnaire

[35]	Prevalence and healthcare cost associated with the management of diabetes foot ulcer in patients attending Ahmadu Bello University Teaching Hospital, Nigeria	North central	Retrospective study	2016	1573	Folders and records with complete date	Folders and records with incomplete date	Medical records and ledgers of diabetic foot ulcer patients
[36]	Nigerian pharmacists self-perceived competence and confidence to plan and conduct pharmacy practice research	National survey	Cross sectional study	2018	200	Registered pharmacists who gave their informed consent	Registered pharmacists who did not give their informed consent	Adapted and validated self-administered questionnaire
[37]	Pharmaceutical care outcomes in an outpatient HIV treatment center in Jos, Nigeria	North central	Prospective 1-year descriptive/intervention study	2014	85 patients and 64839 prescriptions	HIV/AIDS patients ≥15 years and above who gave their informed consent	HIV/AIDS patients ≥15 years and above who discontinued	Prescriptions
[38]	An evaluation of knowledge and perception of pharmacy students on pharmacovigilance activities in Nigeria	Not indicated	Cross sectional survey	2016	342	Final year pharmacy students who gave their informed consent	Pharmacy students who are not in final year	Questionnaire
[39]	Pattern of drug therapy problems and interventions in ambulatory patients receiving ART in Nigeria	North central	Prospective intervention study	2015	9339 patients, 42416 prescriptions and 420 interventions	HIV/AIDS patients ≥15 years and above who gave their informed consent	Prescriptions with incomplete data and HIV patients who did not give their consent	Prescriptions
[40]	Generic medicine substitution : A cross sectional survey of the perception of pharmacists in North-Central Nigeria	North central	Cross sectional survey	2013	330 pharmacists	Registered pharmacists	Pharmacists who did not consent	Questionnaire based
[41]	Hospital and community pharmacists perception of the scope, barriers and challenges of pharmacy practice-based research in Nigeria	South west	Prospective cross-sectional study	2017	65 hospital and 86 community pharmacists	Registered community and hospital pharmacists	Registered community and hospital pharmacists who did not give their informed consent	Questionnaire based

[24]	Drug use pattern for uncomplicated malaria in medicine retail outlets in Enugu urban, southeast Nigeria: implications for malaria treatment policy	South east	Prospective cross sectional survey	2014	1321 anti-malarial prescriptions	anti-malarial prescriptions	anti-malarial prescriptions with incomplete data	Prescriptions/profoma
[42]	Integrating community pharmacies into community based ART: A pilot implementation in Abuja, Nigeria	North central	Prospective cross sectional descriptive study	2017	295 HIV patients, 10 community pharmacies	HIV patients with more than 6 months of ART who gave their informed consent	HIV patients who discontinued and those with unstructured treatment interruptions	-
[43]	Adherence to treatment guidelines for uncomplicated malaria at two health facilities in Nigeria; implications for the test and treat policy of malaria case management	South-east	Retrospective cross sectional study	2014	2171 patients records	Prescriptions with antimalarials	Antimalarial prescriptions with incomplete data	Questionnaire and prescriptions
[44]	Use of simulated patients approach to assess the community pharmacists knowledge of appropriate use of metered dose in haler	South-east	Retrospective cross sectional study with simulated patients approach	2016	41 registered community pharmacists	Registered community pharmacists	Unregistered community pharmacists	Patient simulation
[45]	Engaging Nigerian community pharmacists in public health programs: assessment of their knowledge, attitude and practice in Enugu metropolis	South-east	Cross sectional survey	2015	40 community pharmacies	Registered community pharmacies with pharmacists	Registered community pharmacies that refuse to participate in the study	Questionnaire
[46]	Treatment non-adherence among patients with poorly controlled type 2 diabetes in ambulatory care settings in southeast Nigeria	South west	Prospective cross sectional interview	2014	185 patients	Type 2 diabetes patients who gave their informed consent	Type 2 diabetes patients who did not give their informed consent	Reorganize, identify and managed interview model

[47]	Medication adherence among ambulatory patients with type 2 diabetes in a tertiary healthcare setting in southwestern Nigeria	Southwest	Prospective cross sectional interview	2011	140 patients	Adult type 2 diabetes patients who have been on antidiabetes agents for more than 3 months and gave their informed consent	Type 2 diabetes patients who did not give their informed consent	Questionnaire
[48]	Drug prescribing pattern for under five in a pediatric clinic in southwest Nigeria	Southwest	Cross sectional study	2014	526 prescriptions	Prescriptions with complete data	Prescriptions with complete data that were not legible	Medical record, prescriptions
[49]	Evaluation of the extent and reasons for increased non-prescription antibiotics use in a university town, Nsukka Nigeria	Southeast	Community based cross sectional study	2018	400 respondents	Adults 18 years and above who consented	Adults who did not consent	Semi-structures and self-administered questionnaire
[50]	Prescribing pattern of non NSAIDS at the outpatient of a university teaching hospital in Nigeria	South west	Cross sectional study	2015	3800 prescriptions	Not stated	Not stated	prescriptions
[51]	Evaluation of drug-drug interactions among patients with chronic kidney disease in a South-eastern Nigerian tertiary hospital: a retrospective study	South east	Retrospective review study	2015	169 patients folders	Medial record of patients with chronic kidney disease	Medial record of patients with chronic kidney disease with incomplete data	Medical records and profoma
[52]	Potential drug-drug interactions in HIV infected children on antiretroviral therapy in Lagos , Nigeria	South west	Cross sectional study	2014	310 case files	Children less than 16 years on ART who have used ARV at least once after enrollment	Children less than 16 years on ART who have used ARV at least once after enrollment with incomplete data	Medical records and prescriptions
[53]	Prescription pattern of antihypertensive medications and blood pressure control among hypertensive outpatients at the University of Benin Teaching Hospital in Benin City, Nigeria	Mid-west	Cross sectional descriptive study	2017	224 hypertensive patients	Hypertensive patients who gave their informed consent	Hypertensive patients who dropped out	Data documentation sheet

[54]	A prospective study of adverse events to antiretroviral therapy in HIV- infected adults in Ekiti State, Nigeria	South west	Prospective cross sectional study	2016	120 HIV patients	Adult HIV patients who gave their informed consent	Adult HIV patients who dropped out	-
[55]	Assessment of satisfaction with pharmaceutical services in patients receiving antiretroviral therapy in outpatient HIV treatment setting	Nationwide survey	Cross sectional study	2014	2700 patients	Adult patients who gave their informed consent	Adult patients who did not give their informed consent	Questionnaire
[56]	Impact of generic substitution practice on care of diabetic patients.	South west	Cross sectional study	2014	120 patients	Adult type 2 diabetes patients who gave their informed consent	Adult type 2 diabetes patients who did not give their informed consent	Questionnaire
[57]	Rational use of medicines: assessing progress using primary health centers in Shomolu local government area of Lagos, Nigeria.	South west	Cross sectional descriptive study	2013	600 clinical encounters	Prescriptions with complete data	Invalid prescriptions	Prescriptions
[58]	Frequency, types and severity of medication use-related problems among medical outpatients in Nigeria	South west	Cross sectional descriptive medication use review	2011	400 patients	Patients who gave their informed consent	-	Questionnaire
[59]	The knowledge, perceptions and practice of pharmacovigilance amongst community pharmacists in Lagos state, south west Nigeria	South west	Cross sectional observational study	2011	420 community pharmacies/ pharmacists	Registered community pharmacies/ pharmacists	-	Questionnaire
[60]	Pattern of prescription drug use in Nigerian army hospitals.	South west	Retrospective cross sectional survey	2010	660 case notes	Valid prescriptions	Prescriptions with incomplete data	Questionnaire
[61]	Antimalarial prescribing patterns in state hospitals and selected parastatal hospitals in Lagos, Nigeria	South west	Cross sectional study	2009	100 prescriptions	Valid prescriptions with antimalarials	Antimalarial prescriptions with incomplete data	prescriptions

[62]	Effect of pharmaceutical care programme on blood pressure and quality of life in a Nigerian pharmacy.	South east	Intervention study; non-randomized, single-site, crossover design	2008	40 patients	Hypertensive patients who gave their informed consent	Patients who dropped out	--
[63]	Consumer satisfaction with community pharmacies in Warri, Nigeria.	Mid-west	Cross sectional study	2006	700 pharmacy consumers and 35 community pharmacies	Registered community pharmacies and consumers who gave their consent	Consumers who declined to participate	question-naire
[64]	The frequency of drug history documentation in an institutionalized tertiary care setting in Nigeria	South west	Cross sectional retrospective study	2005	450 case notes	Case notes with complete data	Case notes with incomplete data	Profoma
[65]	Retrospective survey of antibiotic prescriptions in dentistry	South west	Cross sectional retrospective study	2005	313 prescriptions	Complete prescriptions with antibiotics		Profoma
[66]	The effect of an educational intervention on improving rational drug use	South west	Intervention study	2004	Not stated	Participants who gave their informed consent	Participants who dropped out	Profoma
[41]	Hospital and community pharmacists' perception of the scope, barriers and challenges of pharmacy practice-based research in Nigeria	South west	prospective cross-sectional study	2018	65 hospitals, 86 community pharmacists	Registered community pharmacists with minimum of 5years post qualification experience	Registered pharmacists that did not give their informed consent	Question-naire
[67]	Patient Satisfaction with Pharmaceutical Care Services in Selected Health Facilities in Delta State, South-South of Nigeria	South south	Prospective cross sectional study	2017	400 questionnaire	patients aged 21 years and above, and consent to participate in the study.	Patients who declined consent	Question-naire

Table 1: Characteristics distribution of selected studies (Evidence table).

s/n	Geopolitical zones	Number of studies n (%)	Study focus
1	North east	1.0 (2.6)	Adherence to therapy
2	North west	0.0 (0.0)	Nil
3	North central	5.0 (13.2)	Drug utilization and evaluation of disease state management
4	South east	10.0 (26.3)	Drug utilization, patient care evaluation, challenges to PC services
5	South south	1.0 (2.6)	Consumer satisfaction
6	South west	18.0 (47.4)	Drug utilization and chronic diseases management
7	Mid west	2.0 (5.3)	Consumer satisfaction
8	North	1.0 (2.6)	Drug utilization
	Total	38.0 (100)	

Table 2: *Regional focus of pharmaceutical care studies in Nigeria.*

s/n	Level of evidence	Definition	n (%)
1	1A	Systematic review of RCTs	0.0 (0.0)
2	1B	Individual RCT	0.0 (0.0)
3	2A	Systematic review of cohort studies	0.0 (0.0)
4	2B	Individual cohort studies, low-quality RCT	7.0 (18.4)
5	2C	Ecological studies	6.0 (15.8)
6	3A	Systematic review of case-control studies	0.0 (0.0)
7	3B	Individual case control studies	2.0 (5.3)
8	4	Case series, poor quality cohort and case control studies	23.0 (60.5)
	Total		38.0 (100)

Table 3: *Assessment of pharmaceutical care studies in Nigeria based on Oxford Center for Evidence-Based Medicine's Levels of Evidence from Highest to Lowest [68].*

s/n: Serial Number.

s/n	Study types according to hierarchy	n (%)
1	Systematic review and Meta-analysis	0.0 (0.0)
2	Randomized Controlled Trials	0.0 (0.0)
3	Nonrandomized intervention studies	2.0 (5.3)
4	Observational studies	28.0 (73.7)
5	Non experimental studies	8.0 (21.1)
6	Expert opinion	0.0 (0.0)
	Total	38.0 (100.0)

Table 4: *Assessment of pharmaceutical care studies based on the Scottish Intercollegiate Guidelines Network for hierarchy of Study Type [69].*

s/n	Period of publication of study	Number of articles published n (%)
1	≤ 2000	0.0 (0.0)
2	2001 - 2010	7.0 (18.4)
3	2011 - 2018	31.0 (81.6)
Total		38.0 (100.0)

Table 5: *Periodic distribution of pharmaceutical care articles.*

Discussion

An Overview of Pharmaceutical Care Activities in Nigeria

The distribution of the studies revealed high incidence of non experimental studies in the country. All the studies cited were carried out within the last two decades as shown in table 1 and 5. This is understandable because though pharmaceutical care started in Europe and America in the last two decades of the twentieth century, the concept was introduced into the country at the dawn of the twenty first century amidst many oppositions associated with poor knowledge and awareness of the concept and practice and its benefits to healthcare delivery and patients clinical, economic and humanistic outcomes. The study suggested skewed distribution of cited articles to the western and eastern part of the country as shown in table 2. Missionaries entered Nigeria first through the south western coast before moving to the east and north. Most of the educational institutions are located predominantly in the west and eastern part of the country especially the institutions that offer pharmaceutical sciences. This could have contributed to the high incidence of pharmaceutical care studies in these two regions. This was followed closely by the north central part of Nigeria which has more number of pharmacy schools compared to the north east and north central. This is completely different from what is obtainable in most developed countries where many Randomized control Trials (RCTs) and systematic review of RCTs abound for studies carried out in hospitals and community pharmacies. These studies have varying degrees of sophistications [70-72].

Overall, clinical pharmacy is one of the newest aspects of pharmaceutical sciences introduced into the pharmacy curriculum in Nigeria unlike other areas pharmacology, pharmaceutical chemistry, pharmaceutics and pharmacognosy that have been there for long. Pharmaceutical care and public health pharmacy are even much newer in the scene. This too could have contributed to low incidence of pharmaceutical care studies in the country. Most of the studies were carried out in public hospitals followed by community pharmacies and a few population based studies. Despite the fact that pharmaceutical care faced daunting challenges in the hospitals at inception, hospitals remain the main area of its practice. This underscored the high distribution of hospital studies in the review. In resent time, pharmaceutical care is gradually being introduced to community pharmacists through training, retraining and post graduate programs since some of the older pharmacists did not do pharmaceutical care in school. Most of the younger ones who left school within the last two decades accessed the training as undergraduates during their BPharm or PharmD program. This could have suggested the growing incidence of pharmaceutical care studies in community pharmacies within the last one to two decades. Sustained dissemination of evidence based studies in highly visible journals, advocacy and promotion of sound and healthy inter-professional collaboration could serve as veritable tools in bridging the existing gaps and barriers hindering wide acceptance of the principle and practice for overall improvement of patients' outcomes. This is contrary to developed countries like United States of America (USA) and England where the standard of practice is high with high acceptability [73-77]. The study instrument was predominantly structured questionnaire and structured data collection sheet from medical records and prescriptions. The source of data was predominantly primary.

The assessment of pharmaceutical care studies in Nigeria based on Oxford Center for Evidence-Based Medicine level of evidence benchmark from highest to lowest revealed that the evidence level of pharmaceutical care studies within the country still remains at the teething stage. Evidence-based Medicine gold standard e.g. systematic reviews of RCTs, followed by individual RCTs were not cited. A couple of Individual cohort studies, low-quality RCT and Ecological studies at the middle of the scale were sited. Majority of pharmaceutical care studies sited were predominantly case series, poor quality cohort and case control studies. This is contrary to the studies in developed countries like USA and United Kingdom where moist of their studies fall predominantly within the upper part of the scale [75-79].

This suggests a kind of transition from highly sophisticated and more evidence based studies in countries who have practiced pharmaceutical care for longer period of time to studies with lower level of evidence in developing countries who are still grappling with the frontier (Level of Evidence Dynamics). Quick transition in the level of studies from the basement to the upper part of the scale will demand improved funding, and resilience in tackling the limitations associated with implementation of pharmaceutical care as recorded in some studies in developing countries [27,28]. However, the pharmaceutical care studies obtainable in Nigeria recently and other parts of Africa [80-83] were similar to what was obtainable in developed countries two to four decades ago [84-88]. This suggests positive steps in the right direction.

Description of the PC studies and the extent and nature of work done in Nigeria

The review of studies based on regional focus and perspective revealed that south west with the highest recorded number of studies focused mainly on Drug Utilization and chronic diseases management. This was followed by the south east that focused on Drug utilization, patient care evaluation, challenges to PC services and the north central which focused on Drug Utilization and evaluation of disease

state management. The PC resources in the North West remains largely untapped. This could be associated with religious insurgent and terrorists activities that have embattled Nigeria since the last decade. These activities of terrorists has negatively affected public health services, education activities and the socioeconomic status of the people predominantly in the north eastern axis, followed by north central and north west. Immunization activities, maternal and child health, supply of basic amenities and services have adversely affected socioeconomic activities in these regions [89-94].

Description of PC activities and comparisons of the studies to the oxford and Scottish benchmarks for hierarchy of clinical studies

Assessment of pharmaceutical care studies based on the Scottish Intercollegiate Guidelines Network: Hierarchy of Study Type revealed predominant concentration of the studies at the 4th and 5th positions on a six point's scale [68,69]. A pharmaceutical care review article in Athens, Georgia, USA revealed very high percentage of RCTs [95]. Another study in Ireland showed high prevalence of RCTs and Non RCTs [96]. Since quality peer reviewed articles forms the basis for studies at the top of the hierarchy, consistent research and publication of quality peer reviewed studies could be the rate limiting factor to obtaining such studies [97-99].

Learning Points:

1. There has been no review articles describing the nature of pharmaceutical care activities studies in Nigeria

2. All the pharmaceutical care studies in Nigeria till November 2018 fell within the lower half of two standard benchmarks for hierarchy of study types namely: Oxford and Scottish benchmarks for hierarchy of clinical studies.

3. Most of the studies pharmaceutical care studies in Nigeria were carried out in the western and eastern part of Nigeria.

4. This study described pharmaceutical care studies in Nigeria and provided an overview of the pharmaceutical care activities, gave an understand of the studies, extent and nature of work done, described the PC activities, made comparisons with Oxford and Scottish benchmarks for hierarchy of clinical studies to fill the gap, and documented information for interventions, planning, and policy

Conclusion

The distribution of the studies revealed high incidence of non-experimental studies in the country. There was a growing incidence of pharmaceutical care studies in hospitals and community pharmacies within the last one to two decades. The evidence level of pharmaceutical care studies within the country still remains at the teething stage and no RCTs or review was recorded. Most of the PC studies in the country were predominantly recorded in the south west and south eastern axis, followed by the north central axis. The studies fell short of the Oxford and Scottish benchmarks for hierarchy of studies, an indication of developmental and teething stage of PC activities in Nigeria. No narrative review, systematic review, RCTs, systematic review and Meta- analysis of RCTs was recorded.

Limitations of the Study

It is possible that some articles relevant to the study may have been left out due to search and search terms limitations. Some limitations associated with varying levels of bias may have existed in the primary studies which escaped elimination and may have affected the outcome of the study. There may be other better ways of presenting the tables. However, the authors chose these formats for simplicity and clarity of purpose.

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Conflict of Interest

The authors have none to declare.

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