PHYSICIAN – PHARMACIST COLLABORATION IN HEALTHCARE SERVICES IN NIGERIA FROM 1980-2020: A NARRATIVE REVIEW STUDY

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Abstract

Collaborative practice between physicians and pharmacists has a positive effect on healthcare outcomes. Over the years studies have explored factors contributing to interprofessional collaboration. In developed countries attitude within the healthcare team plays a major role in good collaborative practices. While the concept of interprofessional care is still in its infancy in Nigeria, the state and extent of physician-pharmacist collaboration (2PC) studies in health services remain largely unknown in Nigeria. This study described physician-pharmacist collaboration studies in Nigeria. This study adopted narrative review in describing physician-pharmacist collaboration studies in Nigeria. The study was a retrieved literature search conducted on computerized databases. Search terms were used singly, and in combination, using truncation where needed. Only studies carried out in Nigeria and written in the English Language from January 1980 to December 2020 were examined. Data obtained were subjected to descriptive statistics of frequency, percentage, and comparative assessment using the Oxford and Scottish Benchmarks for Study Standard. The study lasted from April to November 2021. A total of 19 articles were used for the study. Studies carried out in south-south, south-west, and south-east had the highest incidence 4(21.05%) respectively. Nationwide, north-east, and north-west had the same number of articles selected 1(5.26%) respectively, apart from north-central 4(21.05%). The studies fell within the lower half of the Oxford and Scottish benchmarks for the hierarchy of study types. Oxford and Scottish benchmarks rank studies based on their levels of evidence. Lowly ranked studies are considered as lacking in robustness with weak level of evidence. Such studies are not reliable for decision making. Systematic, narrative review and others of 2PC studies in the country were absent. Physician-pharmacist collaborative activities fell within the lower half of two standard benchmarks for the hierarchy of studies.

Keywords: Physician, Pharmacist, Collaboration, Healthcare Services, Outcome, Nigeria, Review

Introduction

The historical model that medical practitioners diagnose disease and prescribe medicines, while pharmacists' compound and dispense medicines, continues to be the expectation of many medical doctors and a large part of the general public even though new extended pharmacy roles have been shown to have a significant impact on health care management and health care expenses in the long-term (Soni *et al*, 2020). However, pharmacists are challenged to become key players in optimizing and monitoring medication use and to become advocates for patients (Hepler and Strand, 1990). Accordingly, collaborative relationships with physicians should be developed to enable pharmacists to contribute to effective patient care (Chui *et al*, 2014). Studies have shown

that while conflict has existed between medical practitioners and pharmacists for centuries, substantial progress toward harmony has been made and that is due to, at least in part, to the increasing dependence of medical practitioners on pharmacists for drug information (Cowen, 1992).

Collaborative drug therapy management can promote the appropriate use of medicines, improve patients' health status and quality of life, reduce adverse medication events and optimize the benefits to society from pharmaceuticals (Thomas *et al*, 2006). The provision of safe and effective patient care needs multiple healthcare professionals to collaborate efficiently with clearly defined roles and responsibilities. The World Health Organization defined the interprofessional collaborative practice as "a situation when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, and communities to deliver the highest quality of care across settings" (WHO, 2010). Several studies have documented better outcomes from collaborative care by pharmacists and physicians for patients with specific conditions, including hypertension (Carter *et al*, 2009).

Also, there is consensus that interprofessional collaboration interventions can improve healthcare processes and patient outcomes. This is especially important in the collaborative relationship between physicians-pharmacists (Reeves *et al*, 2017). Pharmacists have been recognized as crucial members of such collaborative practice models due to the increasing complexity of medication therapies, the cost of medication-related morbidity, and the increasing costs of healthcare, which underscore the need for effective working relationships between pharmacists and physicians to improve patient care (CDCP, 2016).

Despite mounting evidence regarding the value of collaborative patient care, little is known about physicians' perspectives and attitude on successful collaboration between physicians-pharmacists in Africa and Nigeria at large. Given this observation and the demonstrated need for pharmacists to be included in interprofessional teams, it is important to understand health care practitioners' views of potential collaboration with pharmacists. Thus, this study presented an overview of physician-pharmacist collaboration studies and services in Nigeria and generated information for intervention, and policymaking.

Methods:

Study Area: The study covered physician–pharmacist collaboration in healthcare studies carried out in Nigeria.

Review question: What is the extent and nature of physician–pharmacist collaboration in Nigeria?

Study population and type of studies included: The search was carried out on PubMed and Google Scholar, for all physician–pharmacist collaboration studies. Manual search was done for studies that met the inclusion criteria. This ensured retrieval of relevant studies while focusing on the study objectives.

Eligibility criteria:

Inclusion criteria

- Studies published in English language
- Peer-reviewed papers were eligible for inclusion
- Physician–pharmacist collaboration 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 physician–pharmacist collaboration
• Studies with clearly stated and defined research design.

Exclusion criteria

• Studies without a 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 physician–pharmacist collaboration in Nigeria.

Risk of Bias: The included studies were assessed for subjects and sampling selection bias, reporting bias before selection.

Condition and Domain studied: Physician–pharmacist collaboration studies and articles that described physician–pharmacist collaboration activities in Nigeria.

Data extraction was done in accordance with the standard reporting protocol for narrative reviews (Bart *et al*, 2001).

Information source: Search was conducted using Google Scholar and PubMed.

Data items and Summary Measures: The data synthesized were sought for study location, design, sample size, year of publication, inclusion criteria, exclusion criteria, year of publication, study instrument, title of publication. Articles that met the inclusion criteria irrespective of their year of publication were selected.

Context: The study covered physician–pharmacist collaboration studies carried out in Nigeria.

Articles search process: The graphical illustration in the figure below (Fig.1) shows how the search was conducted. The related keywords to the title of the study were used for the search. PubMed and Google Scholar were used to search for studies and articles on physician–pharmacist collaboration in Nigeria published between 1980 and 2020. Additional words found appropriate and relevant to the title and objective of the study were utilized. A total of 799 articles were obtained, 447 came from PubMed and 352 articles from Goggle Scholar. These articles were assessed for eligibility based on the inclusion criteria.

Study period and duration: The study lasted from May to June, 2021 and covered peer-reviewed articles published from January 1980 to December, 2020.

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.

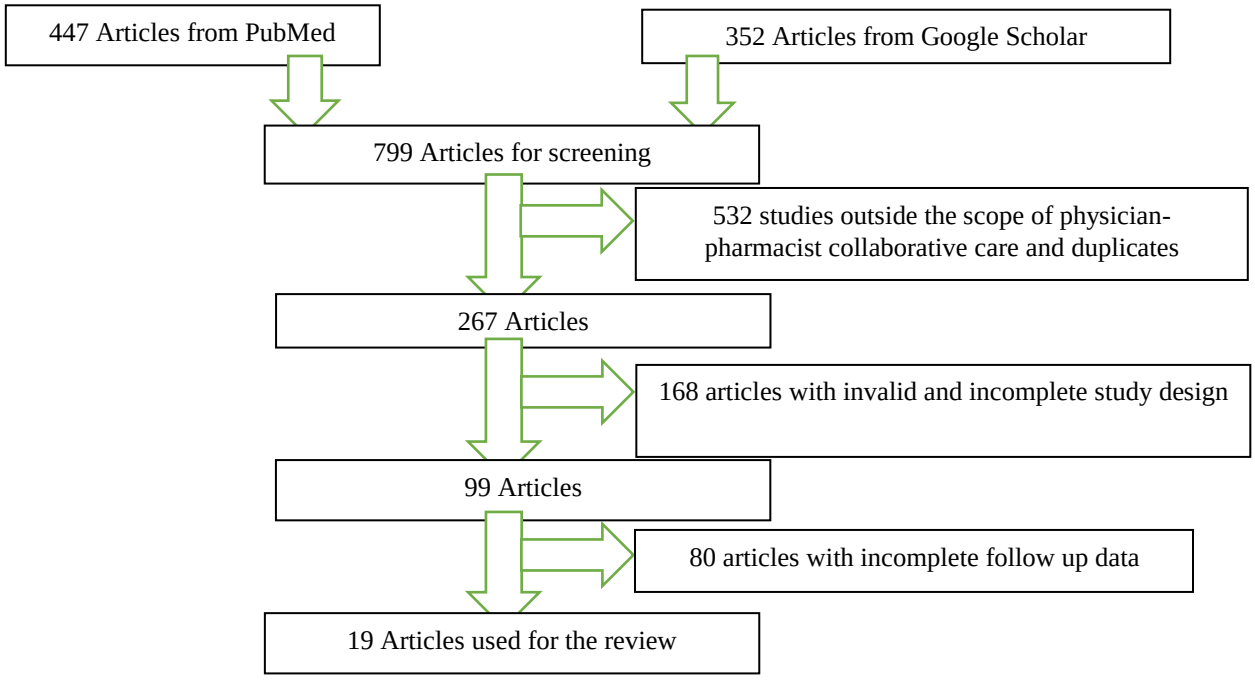
Study articles selection process: A total of 799 articles were obtained, 447 came from PubMed and 352 articles from Goggle Scholar. These articles were assessed for eligibility based on the inclusion criteria. Overall, 532 studies that fell outside the scope of Physician-Pharmacist collaboration were discarded giving rise to 267 articles. On further screening, 168 articles with invalid and incomplete study designs were eliminated, and another 80 articles with incomplete follow-up data which gave rise to 19 studies used for the review.

Data extraction instrument, pilot testing, and data extraction process:

Data Extraction design was adapted from a similar study carried out in Nigeria by Ogbonna *et al* (2019). Data was extracted by careful consideration of the articles, elimination of irrelevant or incomplete ones that did not meet the study objective and criteria. The remaining data were analyzed

and pilot tested. Five articles were used for the pilot test and they were not included in the study. Further modifications such as the arrangement of the date items logically and designing of the sheet into an appropriate table format were made to obtain the final instrument. The instrument was approved by an independent assessor after critiquing it by applying it to two independent studies before being used for the data collection.

Flow Chart of Study Process



Results

Reference	Title	Location	Design	Year of publication	Sample size	Inclusion	Exclusion	Study instrument
Anyika and Alade, 2009.	Evaluation of Pharmacists' Participation in Post-Admission Ward Rounds in a Tertiary Hospital in South-West Nigeria	South-west	Descriptive cross-sectional survey	2009	60	Pharmacists covering various units of pharmaceutical services	Pharmacists not covering various units of pharmaceutical services	Questionnaire
Usifoh *et al*, 2019.	Pharmacists - Medical Doctors Work Relationship and Its Effect on Patient Care in Benin- City, Edo State.	South-South	Descriptive cross-sectional survey	2019	430	Registered practicing medical doctors and registered hospital pharmacists.	Medical doctors and pharmacists not practicing in sampled hospitals and those not willing to participate.	Questionnaire
Soni *et al*, 2020.	The Roles of Pharmacists in Optimizing Care for Hypertensive Patients in Hospital and Community Pharmacies in Edo State, South-South Nigeria	South-south	Descriptive cross-sectional, non-randomized study	2020	155	Practicing registered Pharmacist	Not Registered and practicing Pharmacist	Questionnaire
Fakeye *et al*, 2017.	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	151	Licensed hospital and community pharmacists with at least five years post-qualification experience	HIV/AIDS patients ≥15 years and above who discontinued	Questionnaire

Abah *et al*, 2014.	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
Ogbonna, 2016.	Comprehensive evaluation of health care workers perceptions and attitude on Pharmacist's involvement in ward rounds in three tertiary hospitals in south- east Nigeria	South- east	A descriptive cross-sectional survey	2016	285	Eligible physicians, pharmacists, and nurses who gave their informed consent	Eligible physicians, pharmacists, and nurses who didn't give their informed consent	Questionnaire
Agwo *et al*, 2014.	Patients' Perception on Doctor –Pharmacist Collaborative Practice in Medical Care	North - Central	A prospective survey method	2014	200	Only adult patients (stable) on admission in the wards and adult patients visiting the out-patient department (OPD) of the hospital that consented to participate in the study	Only adult patients (stable) on admission in the wards and adult patients visiting the out-patient department (OPD) of the hospital that didn't consent to participate in the study	Questionnaire
Luwatoyosi *et al*, 2020.	An analysis of how collaboration between physicians and pharmacists might facilitate improved healthcare in Nigeria	Nigeria	A prospective survey method	2020	120	Healthcare professionals (physicians and pharmacists, and patients), that volunteered to partake.	Anyone that did not feel comfortable answering the questions was asked to ignore the link to the form.	Questionnaire

Sorbor and Dapar, 2020.	Impact of Clinical Pharmacist-Led Structured Medication Review Services on Treatment Outcomes on Hypertensive Patients: A Pilot Study	North Central	A non-randomized one-site controlled study (pilot study).	2020	51	Out-patients diagnosed with hypertension of either sex, taking an antihypertensive medication for about one month, aged ≥ 20 years	In-patients diagnosed with hypertension of either sex, taking an antihypertensive medication more/less than one month, aged < 20 years	Questionnaire
Ibraheem *et al*, 2020.	Formal Assessment of Teamwork Among Cancer Health Care Professionals in Three Large Tertiary Centers in Nigeria	South West	A cross-sectional survey	2020	177	All health care professionals who were involved in the care of patients with cancer, full- and part-time staff who worked in the units before the study took place, and all personnel within clinical areas, who either influenced or were influenced by the working environment	Health care professionals who are involved in the care of patients with cancer, full- and part-time staff who didn't work in the units before the study took place, and all personnel outside clinical areas	Questionnaire
Ogbonnaya *et al*, 2007.	The Perception of Health Professions on Causes of Interprofessional Conflict in A Tertiary Health Institution in Abakaliki, Southeast Nigeria.	South-east	A cross-sectional descriptive survey	2007	335	Six professional groups consisting of physicians (Resident doctors), nurses, pharmacists, medical laboratory scientists, physiotherapists, and radiographers.	Non-professional personnel in the Hospital	Questionnaire

Emmanuel and Olajide, 2011.	Evaluation of the Readiness for Collaborative Practice Between Pharmacists and Doctors for Better Drug Utilization in an Urban Setting.	South-south	Cross-section prospective survey	2011	139	Registered Pharmacist and doctors that gave their consent	Registered Pharmacist and doctors that declined their consent	Questionnaire
Adogu *et al*, 2015.	Attitudes, Practice, and Predictors of Rational Use of Medicines among Medicines Prescribers and Dispensers in Nnewi Nigeria	South-East	A cross-sectional study	2015	365	Pharmacy staff in retail pharmacies, licensed patent medicines vendors (PPMVs), and medical doctors in both private and government health establishments	Nonpharmacy staff in retail pharmacies, licensed patent medicines vendors (PPMVs), and medical doctors in both private and government health establishments	Questionnaire
Okonta *et al*, 2012.	Barriers to Implementation of Pharmaceutical Care by Pharmacists in Nsukka and Enugu Metropolis of Enugu State	South-east	A descriptive cross-sectional study	2012	120	Intern, Corper, Chief Pharmacists, and other cadre of pharmacists	Non-Intern, Corper, Chief Pharmacists, and other cadre of pharmacists	Questionnaire
Okoro and Auwal, 2015.	Hospital Pharmacists' Participation in Multidisciplinary Ward Rounds: Physicians' Perceptions and Attitudes	North-East	Uni-center prospective survey	2015	246	Physician working in the hospital	Any other healthcare provider	Questionnaire
Igbanugo *et al*, 2014.	Perception of pharmaceutical care roles of Pharmacists among in-patients in a tertiary Care facility in Jos city, Nigeria	North-central	Cross-sectional descriptive study	2014	548	Patients admitted to the medical, surgical, psychiatric, pediatrics, obstetrics, and gynecology	Outpatients and Patients not admitted to the medical, surgical, psychiatric, pediatrics, obstetrics, and gynecology	Questionnaire

						wards of the hospital during the study	wards of the hospital during the study	
Ajuluchukwu *et al*, 2014.	Physician-adherence to pharmacotherapy guidelines for chronic heart failure in a tertiary health facility in Lagos, Nigeria	South-west	Cross-sectional Retrospective study.	2014	160	Adult patients age > 18 years, ≥ 2 follow-up clinic visits	Age < 18 years	Case note
Erah and Chuks-Eboka, 2008.	Patients' Perception of the Benefits of Pharmaceutical Care Services in the Management of Hypertension in a Tertiary Health Care Facility in Benin City	South-south	Cross-sectional study	2008	285	Adult hypertensive patients enrolled in outpatient consultant clinic	Adult hypertensive patients enrolled in outpatient not enrolled in consultant clinic	Interview
Abubakar, 2020.	Practices and perception of Nigerian community pharmacists towards antimicrobial stewardship program	North-west	Cross-sectional study	2020	130 community pharmacies	All the community pharmacists in the two cities that accepted to participate	Those who declined to participate, and patent medicine vendors	Questionnaire

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

s/n	Geopolitical zones	No of Studies n (%)	Study Focus
1	North-east	1 (5.26)	Perception, attitude, and participation in collaboration
2	North-west	1 (5.26)	Perception and outcome to collaboration
3	North central	4 (21.05)	Perception, impact on collaborative care outcome
4	South-east	4 (21.05)	Perception, barriers, attitude, to collaborative care
5	South-south	4 (21.05)	Perception, roles, readiness, and effect to collaborative care
6	South-west	4 (21.05)	Perception, barriers, teamwork on collaborative care outcome
7	Nationwide	1 (5.26)	Collaborative care importance, outcome
	Total	**19 (100)**	

Table 2*: Focus on studies on physician-pharmacist collaboration in Nigeria according to geopolitical zone distribution.*

S/n	Level of evidence	Definition	n (%)
1	1A	Systematic Review of RCTs	0(0.00)
2	1B	Individual RCTs	0 (0.00)
3	2A	Systematic review of cohort studies	0(0.00)
4	2B	Individual cohort studies, Low quality RCT	0(0.00)
5	2C	Ecological studies	5(26.32)
6	3A	Systematic review of case-control studies	0(0.00)
7	3B	Individual case control studies	0(0.00)
8	4	Case series, poor quality cohort, and case-control studies	14(73.68)
	Total		**19 (100)**

Table 3: *Assessment of Studies on physician-pharmacist collaboration in Nigeria based on Oxford Center for Evidence-Based Medicine's Levels of Evidence from Highest to Lowest* (Nikolaos *et al*, 2005)

s/n	Study types according to hierarchy	n (%)
1	Systematic review and Meta-analysis	0 (0.00)
2	Randomized Controlled Trials	0 (0.00)
3	Nonrandomized intervention studies	3(15.79)

4	Observational studies	16 (84.21)
5	Non-experimental studies	0 (0.00)
6	Expert opinion	0 (0.00)
	Total	**19 (100)**

Table 4: *Assessment of physician-pharmacist collaboration studies in Nigeria based on the Scottish Intercollegiate Guidelines Network for hierarchy of Study Type* (Mann *et al*, 2005).

S/n	Period of publication of study	No of Studies n (%)
1	≤2000	0 (0.00)
2	2001-2010	3 (15.79)
3	2011-2020	16 (84.21)
Total		**19 (100)**

Table 5: *Periodic Distribution of physician-pharmacist collaboration studies in Nigeria*

Discussion

An Overview of Physician-Pharmacist collaboration in healthcare services in Nigeria

Inter-professional collaboration between physicians and pharmacists in the healthcare system is dated back from antiquity (B.C), where the medical and pharmacy profession was seen as a single entity but was not evidence-based. But the present-day collaborative care model (pharmaceutical care) evolved from the USA (ASHP, 1993;Hepler and Strand, 1990;Rovers *et al*, 2003;Sarpong, 2004). Also, the practice of different models of pharmacy practice from the traditional model of dispensing to the newly introduced model of pharmaceutical care, ensures that pharmacists take responsibility for the medication care they provide to the patient, and this ensures collaborating with other healthcare personnel and most importantly with the physicians to ensure rational drug use. This model is been adopted to focus on physician-pharmacist collaborative care in the healthcare system.

The focus physician-pharmacist collaborative care is goal-oriented in its philosophical approach to delivering evidence-based interventions (outcome) for patients with different specific healthcare needs, including hypertension, diabetes, elevated cholesterol, and depression (Carter *et al*, 2009;Lalonde *et al*, 2011;Rubio-Valera *et al*, 2014;Van *et al*, 2011). This approach has efficiently improved the patient's quality of life, reduced the number of hospitals stay, adverse drug reactions at a reduced cost for the patients. These positive outcomes emanating from good collaborative practices between physician-pharmacist is not void of their setbacks within the Nigerian healthcare system, this could be due to perceived threat to the different profession. This is contrary to what obtains in developed countries like United States of America (USA) and England (Avery *et al*, 2012;Hanlon *et al*, 1996;Raebel *et al*, 2007;Riordan *et al*, 2016;Walsh *et al*, 2016).

Over the years, there have been disparity and unseen battles over the supremacy of the

healthcare system in Nigeria and as such have been a big setback in the utilization of collaborative care model practice. These setbacks though vary from region to region likewise state to state across the country. There is also sparse variation between the rural and urban communities. There have been consistent records from various studies showing that perception, attitude, barriers have great effects on physician-pharmacist collaboration within the healthcare system as the medical profession perceives it as an encroachment of the pharmacist into their excluded right of direct care to the patient and the pharmacist perceives it as a marginalization of their profession, negative attitude between physician-pharmacist can result in negative collaborative care and also poor communication and over-expectation from both parties can stand as a big barrier to good collaborative practices (Badet *et al*, 2015). However, Observational studies were the best fit in accessing and analyzing the physician-pharmacist collaboration across various variables in Nigeria this corresponds to the distribution of the studies showing a higher incidence of non-experimental studies in the country. This could also be as a result of the relative ease in the conduct of an observational study than experimental studies.

Also, due to the reduced cost, manpower, and time employed for an experimental study. Most of the studies cited in the work were also carried out within the last two decades as shown in table 1 and 5, recording 3 (15.79%) within the decade of 2001 to 2010 and the last following decade (2011-2020) recording 16 (84.21%) while the decade of 1980-2000 recording one cited work 0 (0.00%). This is largely because the concept of collaborative care first evolved from the European countries (Mossialos, *et al*, 2015) and it's been gradually adopted by the Nigerian government when because it is a focused/goal-oriented model which was introduced within the last 2 decades and it has been gradually the healthcare system for Health Care Providers.

Description of the physician-pharmacist collaboration and the extent and nature of work done in Nigeria

Table 2 revealed the regional distribution of the articles and the study focus of each region. It showed that the highest number of studies were done in North-central, South-east, South-west, South-south 4 (21.05%) respectively, followed by the North-west, North-east, and Nationwide 1(5.26%) of the country respectively. The theme of the works conducted in North-central, South-east, South-west, South-south comprised of the impact of collaborative care, attitude, perception, Barriers, and participation between physician-pharmacists while that of the North-west, North-east, and Nationwide focused more on the importance of collaborative care, participation, attitude, and perception of both physician-pharmacist in their collaborative care practices.

Most of the works were done within South-east, South-west, South-south region possibly because the majority of the medical and pharmaceutical schools are domiciled there and besides, it is easier to access your patients directly and deliver collaborative care in these regions due to less restriction to female genders as well as moral and societal impediments. The Nationwide studies also provided for comparative analysis between regions, states, and more within the year. The few studies sited in the northern region mainly focused on perception and attitude towards collaborative care. Among the Northern region, North-Central posed to have higher works 4(21.05%) carried out as opposed North-east 1(5.26%) and North-west 1(5.26%) respectively.

Description of physician-pharmacist collaboration and comparisons of the

studies to the oxford and Scottish benchmarks for the hierarchy of clinical

Oxford and Scottish benchmarks rank studies based on their levels of evidence. Lowly ranked studies are considered as lacking in robustness with low quality or level of evidence. Studies at the lower are more predisposed to bias as they are not randomized. As such, policies and decisions made based on the outcomes of such studies may be defective. As shown by Table 4 on the hierarchy of studies, majority of the studies 16(84.21%) were observational and was followed by nonrandomized intervention studies 3(15.79). None of the studies was ranked in any other category apart from the two categories above.

Most of the studies cited were surveys carried out using questionnaires as the instrument of study. Although the questionnaires were used directly on the respondents. A few of the studies involved pharmaceutical care but most of them were focused on collaborative care. As portrayed by Table 3 on Oxford benchmark, case series, poor quality cohort, and case-control studies have the highest score of 14(73.68%) while ecological studies had 5(26.32) leaving the rest of the study with a 0% score. This shows that the available information on physician-pharmacist collaboration activities in Nigeria, based on available studies is not high quality. This may not be relied on for decision making.

Conclusion

Many of the articles cited were studies carried out on physician-pharmacist collaborative care within the Nigerian healthcare system. Most of all the studies conducted were observational studies. There was no systematic review, meta-analysis, nor randomized studies from all the articles used for this study. The studies fell short of the Oxford and Scottish benchmarks for the hierarchy of studies, which entails that studies that fall under systematic review, meta-analysis, and randomized control trials benchmark for the hierarchy of studies are strong studies because of their peculiarity, and specificity, studies below this benchmark for the hierarchy of studies are seen to be weak. Therefore, policy makers may not comfortably rely on the outcome of such body of knowledge to make decisions.

Future studies on physician-pharmacist collaborative care that can meet up the benchmark for the hierarchy of studies is need to prompt an intervention in the healthcare system on physician-pharmacist collaborative care, that will affect the health of the patient positively.

Limitations

The possibility of omission due to search and search terms limitations. Some of the studies cited may have some level of bias that escaped elimination which could have an impact on the outcome of the study. The method of presenting tables and data in the present study was purposively chosen for simplicity and clarity even though they could be better presentation formats.

Conflict of Interest

The authors have none to declare.

Grant/Sponsorship

None.

Highlights (Learning Points)

1. No narrative review article was found which reviewed the physician-pharmacist collaborative care in Nigeria over the past four decades.

2. The study articles on physician-pharmacist collaborative care cited since 2020 fell below the higher upper half of the Hierarchy of Study Type Standard Benchmark of Oxford and Scottish benchmarks.

3. Majority of the studies on physician-pharmacist collaborative care in Nigeria were carried out in North-central, South-east, South-west, South-south regions.

4. The theme of the works conducted in the North-central, South-east, South-west, South-south comprised of the impact of collaborative care, perception, attitude, Barriers, and teamwork while that of the nationwide focused more on the importance of collaborative care and outcomes. The studies in the North-west and northeast focused on perception, attitude, participation, and outcome of collaborative care.

5. The present work is a narrative overview of physician-pharmacist collaboration in Nigeria healthcare services. It reviewed a general overview of the collaborative activities, revealed the studies conducted on the subject matter, showed the level of the work done, and gave a comparison of the available studies with some standard benchmarks for the hierarchy of study type. It also gave recommendations and provided documented information for intervention.

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