

Community Pharmacies and Immunization Services in Nigeria from 1980-2023: A Narrative Review

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Received date: June 19, 2024; Accepted date: July 12, 2024; Published date: February 05, 2025

Citation: Achi C James, Ogbonna O Brian, Adenola A Ugochi, Anietoh U Maureen, Okpalamma N Okoli, et al, (2025), Community Pharmacies and Immunization Services in Nigeria from 1980-2023: A Narrative Review, *J. Pharmaceutics and Pharmacology Research*, 8(1); DOI:10.31579/2688-7517/205

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Abstract

Background: Pharmacists practice in a broad multidisciplinary area including community, hospital, industrial, academia, regulatory and practice where they offer therapeutic interventions on drug and medication efficacy, safety and appropriate regimen. Pharmacists have a key role to play to advance public health through immunization. Pharmacists are well trained and play a huge role in vaccine production, research and development, safety, pharmacovigilance, storage, logistics and distribution. This study presented an overview of Community Pharmacies and immunization services in Nigeria and generated information for intervention, outcomes, and policymaking. This study is an overview of Community Pharmacies and immunization studies and Services reviewed in Nigeria by adopting a narrative review literature writing style. The study was a retrieved literature search conducted on computerized databases. Search terms were used singly, in combination, and truncation to select and synthesize articles. Only studies carried out in Nigeria and written in the English Language with clear study design from 1980 to 2023 were utilized. The data obtained were subjected to descriptive statistics of frequency, percentage, and comparative assessment using the Oxford and Scottish Benchmarks for Study Standard. A total of 17 articles met the criteria and were used for the study. The highest incidence of the articles selected was studied in south-west 10 (58.82%), followed by south-south 4 (23.53%), respectively. Nationwide has a distribution of 1 (5.88%), and South-east had the same number of articles selected 1 (5.88%) respectively, while north-west and north-east had 0 (0.00%) article selected. However, the north-central had the highest number 1 (5.88%) of articles cited in the north, respectively. No article on Community Pharmacies and immunization services was cited before the year 2000 0 (0.00%) while the highest number of studies 8 (47.06) was conducted between 2021 and 2023, and 7 (41.18%) between 2011 and 2020 respectively. The studies were found to fall within the lower half of the Oxford and Scottish benchmarks for the hierarchy of studies and study standards.

Conclusion: To maintain and improve coverage, uptake and information dissemination in vaccination and national immunization programs, pharmacists/pharmacies should be involved to contribute to this effort and be prepared to respond to public concerns as part of the scope of pharmacy practice in Nigeria. Most of the studies were predominantly carried out in the western, eastern, and central parts of Nigeria. Nonrandomized intervention studies were available and cross-sectional descriptive surveys were the leading study design carried out which fell within the lower half of two standard benchmarks (Oxford and Scottish) for the hierarchy of studies. Although, Randomized Control Trials (RCTs), narrative reviews, systematic reviews, and meta-analysis of RCTs of PC studies were still not available in the country.

Key words: pharmacist; community pharmacy; healthcare services; immunization; 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 [1]. However, pharmacists are challenged to become key players in optimizing and monitoring medication use and to become advocates for patients [2]. Vaccines are known to stimulate the body's immune system for protection against subsequent exposure to the pathogen or disease while immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine [3].

Pharmacists' role in vaccination and immunization currently varies across countries in the world. They are empowered to play active roles in ensuring the safe supply, storage, administration and dispensing of vaccines, legally authorized to organize vaccination activities and campaigns, advocating for immunization as well as the integration of community pharmacies and pharmacists in national policies [4]. In Nigeria, the vaccination schedule is drafted as per the National Program on Immunization (NPI). The vaccines are administered across a wide range of government and private hospitals, yet pharmacies and/or pharmacists are not involved in the administration of vaccines and this has posed a great limitation to the uptake of vaccines. Globally, it is estimated that existing immunization programs prevent over 2–3 million deaths annually that could have resulted from vaccine-preventable diseases (VPDs) and approximately 19.4 million children missed out on basic vaccination [5].

This places a great economic burden on VPDs as millions remain susceptible to potentially deadly VPDs despite effective vaccine availability. Although there is no official restriction limiting community pharmacists from providing immunization services in Nigeria, there have not been any policy directions or law towards the involvement of them into that [6]. This has caused limited acceptance and support by the healthcare system to recognize pharmacists as an integral member of the vaccine workforce. Nevertheless, there have also been pharmacist-led organizations who have been championing the inclusion of pharmacists in the vaccine workforce in Nigeria to resolve vaccine hesitancy. In middle and low-income countries where vaccine services are being offered, there is also diminishing perceived competition threat to other healthcare professionals providing immunization services through greater advocacy and wider coverage [4]. This will help Nigeria also in establishing a greater healthcare delivery workforce for the societal benefits of the country and demonstrate the full potentials of the community pharmacies and the pharmacists' role in immunization programs.

Methods

Study Area: The study covered Community Pharmacies and immunization services studies carried out in Nigeria.

Review question: What is the extent and nature of Community Pharmacies and immunization services in Nigeria?

Study population and type of studies included: The search was carried out on PubMed and Google Scholar, for all Community Pharmacies and immunization services 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:

- Studies published in English language
- Peer-reviewed papers were eligible for inclusion
- Community Pharmacies and immunization services 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 Community Pharmacies and immunization services
- Studies with clearly stated and defined research design.

Ineligibility 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 Community Pharmacies and immunization services in Nigeria.

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

Condition and Domain studied: Community Pharmacies and immunization studies and articles that described Community Pharmacies and immunization services activities in Nigeria.

Data extraction was done in accordance with the standard reporting protocol for narrative reviews [7]

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 Community Pharmacies and immunization services 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 Community Pharmacies and immunization services in Nigeria published between 1980 and 2023. Additional words found appropriate and relevant to the title and objective of the study were utilized. A total of 250 articles were obtained, 47 came from PubMed and 203 articles from Goggle Scholar. These articles were assessed for eligibility based on the inclusion criteria.

Study period and duration: The study lasted from April to May, 2024 and covered peer-reviewed articles published from January 1980 to December, 2023.

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 250 articles were obtained, 47 came from PubMed and 203 articles from Goggle Scholar. These articles were assessed for eligibility based on the inclusion criteria. Overall, 142 studies that fell outside the scope of Community Pharmacies and immunization services were discarded giving rise to 108 articles. On further screening, 88 articles with invalid and incomplete study designs were eliminated, giving rise to 20 articles, and another 3 articles with incomplete follow-up data which gave rise to 17 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) [8]. 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.

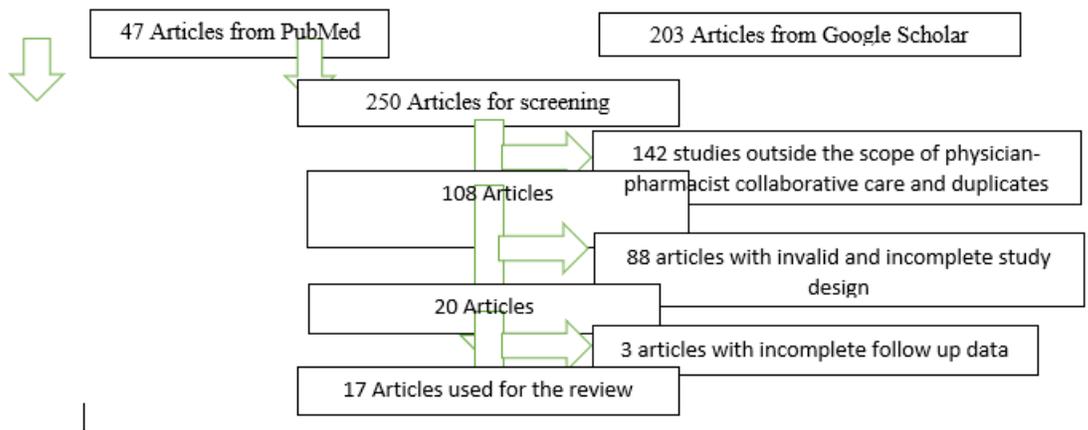


Figure 1: Flow Chart of Study Process

Results

Reference	Title	Location	Design	Year of publication	Sample size	Inclusion	Exclusion	Study instrument
[9]	1 Evaluation of the Participation of Community Pharmacists in Primary Healthcare Services in Nigeria: A Mixed-Method Survey Nigeria	South-west	A Descriptive cross-sectional survey	2022	321	Only retail pharmacies with first date of registration as community pharmacists was 2018 or earlier were included.	Non retail pharmacies with first date of registration as community pharmacists was 2018 or earlier	Question naire, Interview
[10]	Community pharmacists, participation in immunization services in cross river state, Nigeria.	South - South	A Descriptive cross-sectional survey	2019	68	Registered practicing community pharmacists.	Registered practicing non community pharmacists and those not willing to participate.	Question naire
[11]	2 Availability, storage, handling and administration of vaccines in community pharmacies: Southwest Nigeria as a case study	South-west	A Descriptive cross-sectional survey	2023	191	Community Pharmacist	Non community Pharmacist	Question naire
[12]	Knowledge, attitude and participation of community	South - west	A Descriptive cross-	2015	120	Licensed community	Pharmacists on other line of practice within and	Question naire

	pharmacists in Lagos state, Nigeria towards primary health care (PHC)		sectional study			pharmacists within the research area	outside the research area	
[13]	3 Community pharmacies as possible centers for routine immunization	South - west	A Descriptive cross-sectional study	2007	60	Community Pharmacist	Non community Pharmacist	Question naire
[14]	4 Evaluation of community pharmacists' involvement in public health activities in Nigeria.	South - West	A descriptive cross-sectional survey	2018	130	Eligible registered community pharmacies and pharmacists who gave their consent	Eligible registered pharmacies and pharmacist who didn't give their informed consent	Question naire
[15]	Challenges in providing immunization services amongst community pharmacists in south-south Nigeria: A cross sectional study	South - south	A Descriptive cross-sectional study	2019	68	All the licensed community pharmacists that registered the 68 community pharmacies empowered legally to carry out pharmaceutical services	All the licensed community pharmacists that did not register the 68 community pharmacies empowered legally to carry out pharmaceutical services.	Question naire
[16]	Perception, benefits and barriers to community pharmacy vaccination services in Nigeria; a cross-sectional study of two south-western states	South -west	A Descriptive Cross sectional survey	2020	474	Registered community pharmacist for that year	Non-Registered community pharmacist for that year	Question naire
[17]	Engaging Nigerian community pharmacists in public health programs: assessment of their knowledge, attitude and practice in Enugu metropolis	South -east	A Descriptive cross-sectional survey	2015	40	Registration with Pharmacist Council of Nigeria (PCN) and a full or part time pharmacist(s) working in the community pharmacy.	Registration with Pharmacist Council of Nigeria (PCN) and not a full or part time pharmacist(s) working in the community pharmacy.	Question naire
[18]	4.1 Immunization Services: Involvement of Community Pharmacies in Lagos State, Nigeria	4.3 South-west	4.4 A descriptive cross-sectional study	4.5 2016	4.6 403	4.7 Registered pharmacies and 4.8 Pharmacies located within Lagos state	4.9 Non-Registered pharmacies and 4.10 Pharmacies not located within Lagos state	4.11 Questionnaire
[19]	Extensive Analysis of Pharmacists' Roles and Services towards Vaccine-Preventable Diseases in Bayelsa State, Nigeria	South - south	A descriptive cross-sectional study	2021	105	Registered Pharmacist working in Bayelsa State	Registered Pharmacist not working in Bayelsa State	Question naire
[20]	Pharmacists' knowledge and practice regarding immunization in Ogun State, Southwest, Nigeria	South -west	A descriptive cross-sectional study	2021	180	Registered and practicing pharmacist in the research area	Registered and practicing pharmacist not in the research area	Question naire
[21]	Pharmacists' Readiness to Receive, Recommend and Administer COVID-19 Vaccines in an African Country: an online multiple-	Nationwide	A descriptive cross-sectional study	2021	509	Registered and practicing Pharmacist	Not Registered and practicing Pharmacist	Question naire

	practice settings survey in Nigeria							
[22]	Community Pharmacists' Services during the COVID-19 Pandemic A Case Study of Lagos State, Nigeria	South-west	A descriptive cross-sectional study	2022	240	Community pharmacists duly registered with the Pharmacists' Council of Nigeria and practicing in Lagos state.	Pharmacists in other pharmacy practice areas were excluded from the study.	Question naire
[23]	Evaluation of Community Pharmacists' Involvement in Primary Health Care.	South-south	A descriptive cross-sectional study	2002	110	Community pharmacists duly registered with the Pharmacists' Council of Nigeria and practicing in Benin city	Pharmacists in other pharmacy practice areas were excluded from the study	Question naire
[24]	Knowledge and attitude of community pharmacists towards the practice of pharmaceutical public health in north-central Nigeria	North-central	A cross-sectional descriptive study	2021	105	Community pharmacist practicing in the study area	Practicing pharmacist in other settings	Question naire
[25]	Provision of Pharmaceutical Care Services by Community and Hospital Pharmacists in Oyo State, Nigeria	South-west	A cross-sectional descriptive study	2023	96	Community pharmacists registered with the Pharmacists' Council of Nigeria (PCN), Oyo State Chapter and hospital pharmacists drawn from the nominal rolls of Oyo State Ministry of Health and University College Hospital(UCH), Ibadan.	Non Community pharmacists registered with the Pharmacists' Council of Nigeria (PCN), Oyo State Chapter and non-hospital pharmacists drawn from the nominal rolls of Oyo State Ministry of Health and University College Hospital(UCH), Ibadan.	Question naire

Table 1: Evidence-based table of the characteristics of studies used

S/n	Geopolitical zones	No of Studies n (%)	Study Focus
1	North-east	0 (0.00)	
2	North-west	0 (0.00)	
3	North central	1 (5.88)	Knowledge and attitude of community Pharmacists towards immunization services
4	South-east	1 (5.88)	Knowledge and attitude of community Pharmacists towards immunization services
5	South-south	4 (23.53)	Participation, challenges and roles of community Pharmacists towards immunization services
6	South-west	10 (58.82)	Participation, knowledge, attitude, barriers, perception, benefits towards immunization services, availability, storage and handling of vaccines by community Pharmacists
7	Nationwide	1 (5.88)	Readiness to receive and recommend vaccine in community Pharmacies
	Total	17 (100)	

Table 2: Focus on studies on Community Pharmacies and immunization services 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	0(0.00)
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	17(100)
	Total		17(100)

Table 3: Assessment of Studies on Community Pharmacies and immunization service in Nigeria based on Oxford Center for Evidence-Based Medicine's Levels of Evidence from Highest to Lowest [26].

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	0(0.00)
4	Observational studies	17(100)
5	Non-experimental studies	0(0.00)
6	Expert opinion	0(0.00)
	Total	17(100)

Table 4: Assessment of Community Pharmacies and immunization service studies in Nigeria based on the Scottish Intercollegiate Guidelines Network for hierarchy of Study Type [27].

S/n	Period of publication of study	No of Studies n (%)
1	≤2000	0 (0.00)
2	2001-2010	2 (11.76)
3	2011-2020	7 (41.18)
4	2021-2023	8 (47.06)
	Total	17 (100)

Table 5: Periodic Distribution of Community Pharmacies and immunization service studies in Nigeria

Discussion

An Overview of Community Pharmacies and immunization services in Nigeria

Pharmacists' role in vaccination and immunization currently varies across countries in the world. They are empowered to play active roles in ensuring the safe supply, storage, administration and dispensing of vaccines, legally authorized to organize vaccination activities and campaigns, advocating for immunization as well as the integration of community pharmacies and pharmacists in national policies [4]. In Nigeria, the vaccination schedule is drafted as per the National Program on Immunization (NPI). The vaccines are administered across a wide range of government and private hospitals, yet pharmacies and/or pharmacists are not involved in the administration of vaccines and this has posed a great limitation to the uptake of vaccines.

Globally, it is estimated that existing immunization programs prevent over 2–3 million deaths annually that could have resulted from vaccine-preventable diseases (VPDs) and approximately 19.4 million children missed out on basic vaccination [5]. Therefore, in order to maintain and improve coverage, uptake and information dissemination in vaccination and national immunization programs, pharmacists/pharmacies should be involved to contribute to this effort and be prepared to respond to public concerns as part of the scope of pharmacy practice in Nigeria. Above all

this new extended model of practice by community Pharmacists in community Pharmacies is at its infancy in Nigeria healthcare system.

Notwithstanding, Over the years, there is no official restriction limiting community pharmacists from providing immunization services in Nigeria, there have not been any policy directions or law towards the involvement of them into that [6]. This has caused limited acceptance and support by the healthcare system to recognize pharmacists as an integral member of the vaccine workforce.

Nevertheless, there have also been pharmacist-led organizations who have been championing the inclusion of pharmacists in the vaccine workforce in Nigeria to resolve vaccine hesitancy. There have been consistent records from various studies showing that availability, attitude, knowledge, barriers, participation, have great effects on Community Pharmacies/Pharmacists providing an extended role on immunization within the healthcare system as the medical profession, other team players in the health care team and populace perceives it as an encroachment of the community Pharmacies/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 the healthcare team and pharmacist can result in negative collaborative care and also poor communication and over-expectation from both parties can stand as a big barrier in delivering a good immunization services to the populace and as such the idea of vaccination would be defeated if left unattended [28].

However, Observational studies were the best fit in accessing and analyzing the Community Pharmacies/Pharmacists and immunization services 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 2(11.76%) within the decade of 2001 to 2010 and the next following decade (2011-2020) recording 7(41.18%) and the present decade (2021-2023) recording 8(47.06%), while the decade of 1980-2000 recording no cited work 0(0.00%). This is largely because the concept of Community Pharmacies and immunization services first evolved from the European countries and it's been gradually adopted by the Nigerian government when because it gives a better outcome in reaching out to more of the populace through the vaccination process which was introduced within the last 2 decades and it has been gradually adopted by Pharmacist's domicile in the community practice setting.

Description of the Community Pharmacies and immunization services 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 South-west 10(58.82), closely followed by South-south 4(23.53%) respectively, followed by the South-east, North central and Nationwide 1(5.88%) of the country respectively. There was no article cited in the North-west and north-east 0(0.00%). The theme of the works conducted in North-central, South-east, South-west, South-south comprised of the impact of the knowledge, attitude, participation and perception between community Pharmacists and immunization services, while that of the North-west, North-east, and Nationwide focused more on the importance of community Pharmacists and immunization services, knowledge, attitude, readiness and perception of community Pharmacies on immunization services.

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 immunization services 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 cited in the northern region mainly focused on the readiness of community pharmacist to deliver and recommend good immunization services. Among the Northern region, North-Central posed to have higher works 1(5.88%) carried out as opposed North-east 0(0.00%) and North-west 0(0.00%) respectively.

Description of Community Pharmacies and immunization services and comparisons of the studies to the oxford and Scottish benchmarks for the hierarchy of clinical

As shown by Table 4 on the hierarchy of studies, observational studies had the only recorded number studies 17(100%). Studies in the hierarchy other than nonrandomized intervention studies, had no record as observational studies presumably were the best fit in accessing and analyzing the collaborative differentials across various variables. 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 immunization and vaccination but most of them were focused on community Pharmacies/Pharmacists. As portrayed by Table 3 on the Evidence-based

Medicine Evidence level, Case series, poor quality cohort, and case-control studies was the only score of 17(100%) while the rest of the study with a 0(0.00%) score. This shows that community Pharmacies and immunization services in Nigeria are still in their infancy.

There is a need for a revised national policy and strategy in Nigeria on vaccination and immunization programs with the involvement of community pharmacies and/or pharmacists. Community pharmacy is one of the most accessible and most frequently consulted points of care to the public. Indeed, community pharmacies represent healthcare settings in the community where vaccines can be given to the public as pharmacists play a great role and are very well informed about vaccine product characteristics, manufacturing specificities and complexity, vaccine research and development. This will help accelerate getting a wider vaccination access coverage, establishing a greater healthcare delivery workforce for societal benefits and demonstrate the full potential of the community pharmacies and the pharmacists' role in immunization programs.

Conclusion

Many of the articles cited were studies carried out on Community Pharmacies and immunization services within the Nigerian healthcare system. Most of all the studies conducted were observational. The distribution of the studies recorded a higher incidence of the study conducted South-east, South-west, South-south as compared to the various other regions. The studies fell short of the Oxford and Scottish benchmarks for the hierarchy of studies showing that the community pharmacies and immunization services activities in Nigeria are at their primary level.

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 Community Pharmacies and immunization services in Nigeria over the past four decades.
2. The study articles on community pharmacies and immunization services 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 community Pharmacies and immunization services in Nigeria were carried out in South-east, South-west, South-south regions.
4. The theme of the works conducted in the South-east, South-west, South-south comprised of the impact community pharmacies knowledge, perception, attitude, Barriers, and participation while that of the nationwide focused more on the importance readiness of community pharmacies/pharmacists towards immunization services. There were no studies in the North-west and north-east, while the North-central focused on knowledge and attitude on immunization services.

5. The present work is a narrative overview of Community Pharmacies and immunization services in Nigeria healthcare services. It reviewed a general overview of the Community pharmacies/pharmacists and Immunization services, 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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DOI:10.31579/2688-7517/205

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