ORIGINALE ARTICLE

Assessment of Community Pharmacies' Preparedness for Hypertension Services: A Cross-Sectional Survey in Jos Metropolis, Nigeria

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ABSTRACT

Background: Hypertension is a significant public health concern, therefore, integrating community pharmacies into primary healthcare services could greatly benefit community health outcomes. **Objectives:** This study identifies key strengths and gaps in the resource readiness of community pharmacies in Jos-North Local Government Area, Nigeria, to effectively provide hypertension risk assessment and care. **Methods:** A cross-sectional survey was conducted involving 87 community pharmacies and 89 pharmacists by adapting the World Health Organization's Service Availability and Readiness Assessment tool focusing on staffing, basic equipment and tools, knowledge competency, collaboration and medicines for hypertension. Data were analysed descriptively. Resource readiness was defined by 80% availability based on the World Health Organization's global action plan on non-communicable diseases. **Results:** The average workforce per pharmacy was 3.06, with some pharmacists having received hypertension training. However, overall training and knowledge were below the 80% benchmark necessary for effective service delivery. While hypertension medications, such as diuretics and calcium channel blockers, were available, hypertension screening services were less accessible, indicating a need for greater focus on preventive care. Critical tools, including sphygmomanometers, treatment guidelines, and consultation spaces, generally met the 80% benchmark. This suggests that pharmacies have the foundational resources needed for hypertension management. However, there was a lack of established collaboration and referral systems, as well as inadequate client record maintenance. These aspects are vital for ensuring comprehensive care and continuity in hypertension management. **Conclusion:** Addressing the identified gaps, particularly in training, focusing on hypertension risk assessment, and collaborative practices, will be essential for maximizing the impact of these pharmacies in public health efforts against hypertension.

Keywords: Community pharmacy, Hypertension risk assessment, Services readiness, Nigeria

1. INTRODUCTION

Hypertension is a leading global risk factor for diseases and deaths [1]. In low- and middle-income countries such as Nigeria, where healthcare resources are constrained, the prevalence of hypertension is rising [2, 3]. Expanding access to hypertension health services through the judicious use of available resources could significantly improve management outcomes. Hypertension is a critical public and clinical health issue in Nigeria, affecting over 30% of the adult population [4, 5]. This high prevalence is attributed to increasing dietary and lifestyle factors. Untreated or poorly managed hypertension can lead to severe complications, including heart failure, stroke, kidney disease, and increased mortality [6]. Therefore, effective hypertension management is crucial for achieving substantial health gains in Nigeria. The management of hypertension in Nigeria faces several challenges, including limited access to healthcare facilities, a shortage of healthcare professionals, and inadequate access to medications [7]. Primary healthcare centres (PHCs), which are intended to identify and manage hypertension at the community level, are often overwhelmed with infectious disease services and lack the capacity to provide comprehensive hypertension care [8]. These limitations impede effective diagnosis, treatment, and management of hypertension.

Integrating community pharmacies into the primary healthcare system in Nigeria could enhance access to hypertension care services. In Nigeria, community pharmacies are private-sector-owned facilities usually located within proximity to the communities they serve [9], presenting a convenient and accessible resource for hypertension service enhancement. Though not yet fully integrated into the primary healthcare system in Nigeria, community pharmacies provide a range of primary healthcare services including blood pressure, blood glucose and body mass index which are all important for hypertension risk assessment [9]. Community pharmacy-led interventions are noted to improve hypertension management outcomes [10-12]. Thus, involving community pharmacies as an integral part of the nation's primary health system for hypertension care service would be an efficient use of scares health resources in Nigeria. The World Health Organization's Package for Essential Non-communicable Disease [13] (PEN) intervention encourages the mobilization of non-physician healthcare professionals to expand healthcare services in resource-constrained settings like Nigeria. To effectively involve community pharmacies in hypertension management, it is essential to assess their preparedness. This includes evaluating their infrastructure, staff training, health technologies, and tools for hypertension care [14]. A previous study by Maurine et al., (2022) [15] reviewed community pharmacies' preparedness for primary healthcare services in Nigeria, noting the expansion of services such as disease prevention and medication therapy management. However, there is a lack of specific literature on the resource preparedness of community pharmacies for hypertension management. Collecting data on this preparedness will identify critical issues and areas needing

improvement, thereby facilitating the integration of community pharmacies into hypertension risk assessment and care services.

2. MATERIAL AND METHODS

2.1 Study Setting and Design

This research focused on community pharmacies in Jos North, Plateau State, Nigeria, specifically targeting all licensed pharmacies operating in the area as of December 31, 2022. A cross-sectional survey design was utilized to assess the preparedness of these pharmacies in delivering hypertension management services. The selection of Jos North Local Government Area was based on its substantial number of community pharmacies, making it an ideal location for feasible data collection.

2.2 Study Instrument and Procedure for Data Collection

To assess the preparedness of community pharmacies, the study adapted the World Health Organization's Service Availability and Readiness Assessment [14] tool, focusing on available services and service preparedness concerning hypertension management. Key areas assessed included the availability of hypertension service, basic equipment and medications, staffing, health record management, and collaboration with other health services. Additionally, pharmacists' knowledge competency regarding hypertension was assessed using a case-scenario questionnaire developed by Peck and colleagues [16]. The study's questionnaire was refined for face validity by three academic pharmacists to ensure its relevance and accuracy. Informed consent was obtained from all respondents before data collection. Community pharmacists completed the hypertension-related knowledge questionnaire, while trained research assistants administered the site preparedness questionnaire through interviews with the pharmacist or a designated officer. During the study period from May 2023 to July 2023, all consenting pharmacists present at the sites participated in the knowledge assessment, while each site provided one respondent for the preparedness questionnaire.

2.3 Ethical Clearance

Ethical approval for the study was obtained from the Health Research and Ethics Committee of the Plateau State Specialist Hospital in Jos, Plateau State (Ref. No. PSSH/ADM/ETH.CO/2015/004) before the commencement of data collection. Participation in the study was voluntary, and participants' identities were not recorded as part of the data, ensuring confidentiality throughout the research process.

2.4 Data Analysis

Data collected from the study were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 25. Descriptive statistics, including percentages and means, were computed to portray both the study sites and community pharmacists. Service preparedness for hypertension care was assessed based on resource availability, with an 80% threshold set to indicate good preparedness, as recommended by the World Health Organization's global action plan on non-communicable diseases [17]. For the knowledge assessment, each questionnaire item was scored as 1 for a correct answer and 0 for an incorrect one. A gap in basic hypertension-related knowledge was identified when less than 70% of respondents answered correctly for a specific item. Conversely, good knowledge competency was defined as respondents scoring at least 70% across the total knowledge items, following the methodology outlined by Peck and colleagues [16].

3. RESULTS

3.1 Demographic Characteristics of Community Pharmacies and Pharmacists

In the survey conducted in Jos-North LGA, 87 community pharmacies participated, with 75.9% offering patient screening and consultations. Ownership trends showed that a significant majority, 88.5%, were pharmacist-owned, and 25.3% of these pharmacies were situated in semi-urban areas (Table 1).

Table 1 : Demographic characteristics of Community Pharmacies (N=87).

Variable	Attribute	Frequency	Percentage
Pharmacy service type	Retail	21	24.1
	Retail / consulting	53	60.9
	Retail, consulting, wholesale	13	15.0
Pharmacy ownership	Self	19	21.8
	Another Pharmacist	58	66.7
	Non-Pharmacist	10	11.5
Location of the pharmacy	Semiurban	22	25.3
	Urban	65	74.7

Table 2 details the demographic characteristics of the participating pharmacists. Among the 112 pharmacists on staff, 89 were present during the study and participated in the survey. The respondents were predominantly male (56.7%), with two-thirds holding a Bachelor of Pharmacy (BPharm) degree as their highest qualification (67.4%). The mean age of the community pharmacists was 30.75 years (SD = 8.78), and their average professional experience was 5.67 years (SD = 7.00).

Table 2: Demographic characteristics of community pharmacists (n=98).

Variable	Attribute	Frequency	Percentage
Gender	Male	80	56.7
	Female	60	42.6
Pharmacy Qualification	BPharm	95	67.4
	PharmD	33	23.4
	Masters	3	2.1
	Others	10	7.1
Age (in years)	Mean	30.75	
	Standard deviation	8.78	
Experience (in years)	Mean	5.67	
	Standard deviation	7.00	

3.2 Hypertension Services Availability

Table 3 outlines the hypertension-related services provided by community pharmacies. The most commonly offered service was dispensing prescribed medicines for hypertension, with 45% of facilities indicating they always provide this service. Additionally, 49% of pharmacies often monitor the blood pressure of patients on hypertension treatment, while 46% frequently conduct screenings for hypertension diagnosis.

Table 3: Hypertension service availability (n= 87).

Item	Response frequency (%)			
	Never	Rarely	Often	Always
Dispense medicines for hypertension	2 (2.3)	20 (23.0)	25 (28.7)	40 **(46.0)**
Screen clients for hypertension diagnosis	5 (5.7)	19 (21.8)	**40 (46.0)**	23 (26.4)
Monitor hypertensive client's blood pressure	1 (1.1)	6 (6.9)	**43 (49.4)**	37 (42.5)
Recommends medicines for hypertension	5 (5.7)	26 (29.9)	**36 (41.4)**	20 (23.0)

Bold response represents the modal score for the item.

3.3 Community Pharmacies Resource Preparedness for Hypertension Services

Table 4 presents an overview of community pharmacies' preparedness to deliver hypertension services. On average, each pharmacy had a workforce of 3.06 (SD = 5.53), consisting of 1.29 pharmacists (SD = 0.65) and 1.01 Junior Community Extension Workers (JCHEW/CHEW) (SD = 2.63). In terms of essential equipment and resources, community pharmacies scored over 80% for several key items: sphygmomanometers (96.3%), hypertension treatment guidelines (85%), and space for client consultation (89.7%). However, scores were below 80% for referrals (55.2%), collaboration with clinics/hospitals (34.5%), and maintaining clients' records (21.4%). Regarding the availability of hypertension medications, diuretics (90.8%) and calcium channel blockers (81.6%) exceeded the 80% threshold, while angiotensin-II-converting enzyme inhibitors (75.6%) and angiotensin-II receptor blockers (67.8%) fell below this benchmark.

Table 4: Community pharmacy hypertension service preparedness (n=87).

Variable	Attribute	Score
Availability of workforce	Total (mean ± SD)	3.06 ± 5.53
	Pharmacist (mean ± SD)	1.29 ± 0.65
	CHEW/JCHEW (mean ± SD)	1.01 ± 2.63
	Others (mean ± SD)	1.14 ± 3.82
Availability of equipment	Sphygmomanometer n (%)	84 (96.6)
	Manuel n (%)	49 (55.2)
	Digital n (%)	70 (80.5)
	Weighing balance	69 (79.3)
	Stadiometer/ measuring tape/stick n (%)	32 (36.8)
	Statoscope n (%)	57 (65.5)
Availability of tools	Hypertension treatment guideline n (%)	76 (87.4)
	Hard copy n (%)	34 (39.1)
	Soft copy n (%)	49 (56.3)
	WHO, 2021 n (%)	40 (46)
	JNC 7 or 8 n (%)	39 (44.8)
Availability of hypertension medicines	Thiazide-type diuretics	79 (90.8)
	Calcium channel blockers	71 (81.6)
	Angiotensin-II-converting enzyme inhibitors	66 (75.9)
	Angiotensin-II-receptor blockers	59 (67.8)
Availability of infrastructure / process	Consulting space	78 (89.7)
	Keep the client's health record	21 (24.1)
	Collaborate with clinic/hospital	30 (34.5)
	Refer patients	48 (55.2)

3.4 Community Pharmacists' Hypertension Service Competency

Table 5 highlights the knowledge gaps among community pharmacists regarding hypertension care. Out of a 10-item questionnaire, six items indicated insufficient knowledge, as fewer than 70% of respondents answered correctly. Key areas of concern included the recommended intervals for monitoring patients on hypertension medication (46.9%), the protocol for treatment intensification (58.2%), and the blood pressure threshold for diagnosing hypertension (60.2%).

3.5 Knowledge questionnaire case scenario

"*A patient comes to see you at your pharmacy. He is 40 years old. He asks for treatment of frequent headaches. He denies any history of fevers. The patient tells you that he had his blood pressure measured 1 month ago and it was 155/105. His body mass index is 29 kg / m^2. Please state whether the following statements are true or false.*" [16].

The results presented in Table 5 reveal varying levels of hypertension-related knowledge among community pharmacists (n=89). Respondents demonstrated high proficiency in understanding the importance of lifestyle modification education (98.0% correct responses), recognizing complications of untreated hypertension (94.4%), and acknowledging the necessity of comprehensive initial assessments (93.9%). However, significant knowledge gaps were identified in several areas, with correct responses falling below 70%. These deficits were evident in differentiating hypertension symptoms (69.4%), accurately defining hypertension (60.2%), identifying appropriate management settings (66.8%), adjusting antihypertensive therapy (58.2%), understanding treatment duration (67.3%), and determining follow-up frequency (46.9%). Notably, the most substantial knowledge gap pertained to understanding the appropriate follow-up frequency for newly diagnosed hypertensive patients, with only 46.9% of pharmacists answering correctly. Conversely, pharmacists exhibited stronger knowledge regarding first-line therapy for black patients with hypertension (85.7% correct responses). These findings underscore the need for targeted educational interventions to address specific areas of knowledge deficiency among community pharmacists in hypertension management.

Table 5: Hypertension-related knowledge gaps (n=89).

SN	Knowledge item	Correct response	n	%
1	At the first visit, it is important to ask about other symptoms, conduct a brief general examination, and take blood pressure (BP) on both arms.	True	92	93.9
2	The headaches that this patient is experiencing are most likely due to malaria.	False	68	**69.4**
3	This patient probably does not have hypertension since hypertension is defined as a systolic blood pressure of greater than 160 mmHg	False	59	**60.2**
4	High blood pressure can be a dangerous disease and therefore must only be managed in a well-equipped hospital	False	65	**66.8**
5	For patients with high blood pressure, it is important to educate them to not add salt to food, to reduce weight if he/she is overweight, and to perform regular exercise	True	96	98.0
6	If drug therapy is indicated for hypertension, the best, first-line therapy for most black patients should be a thiazide diuretic drug, e.g., such as hydrochlorothiazide or bendrofluazide.	True	84	85.7
7	If the blood pressure remains greater than 160/100 mmHg with first-line therapy, the best course of action is to stop that drug and start the patient on another drug like diazepam or frusemide.	False	57	**58.2**
8	In patients with hypertension, medications can usually be stopped as soon as the blood pressure is normal.	False	66	**67.3**
9	Possible serious complications of chronic, untreated high blood pressure include stroke, kidney failure, heart failure, and infarction of the heart.	True	84	94.4
10	In the first year after being started on antihypertensive treatment, a person with hypertension only needs to return to the clinic every 1 month in order to check blood pressure and receive further counselling and adjustments in medications.	False	46	**46.9**

Bold % indicates knowledge gap (correct score < 70%).

Results from the survey of community pharmacists (n=89) regarding their hypertension knowledge competency are presented in Table 6. The majority of respondents (61.2%, n=60) reported having received hypertension-related training, while 38.8% (n=38) had not. Among those who received training, certification courses were the most common mode (33.7%, n=33), followed by workshops (29.6%, n=29), and other modes (5.1%, n=5). With respect to hypertension-related knowledge, 60.2% (n=59) of the pharmacists were categorized as having good knowledge, whereas 39.8% (n=39) were classified as having poor knowledge. Both the training and knowledge competency levels fell below the 80% benchmark [17]. These findings suggest that while a substantial proportion of community pharmacists have received hypertension-related training and demonstrate good knowledge, there remains a significant portion who may benefit from additional education and training in this area.

Table 6: Hypertension knowledge competency of community pharmacists (n=89).

Variable	Attribute	Frequency (%)
Hypertension related training	Yes	60 (61.2)
	No	38 (38.8)
Mode of training	Workshop	29 (29.6)
	Certification course	33 (33.7)
	Other modes	5 (5.1)
Hypertension-related knowledge category	Good	59 (60.2)
	Poor	39 (39.8)

4. DISCUSSION

This study assessed the availability and preparedness of community pharmacies in Jos-North LGA, Plateau State, Nigeria, for delivering hypertension health services. Given the challenges in diagnosing, treating, and managing hypertension in Nigeria, the involvement of community pharmacies is crucial for improving health outcomes. By evaluating the resource capacity of these pharmacies, the study identified both strengths and deficiencies that need to be addressed for community pharmacies to be involved as Primary Healthcare Centres for hypertension services in Nigeria. This assessment is a significant step towards enhancing the integration of community pharmacies into the healthcare system, ultimately aiming to improve hypertension management in the community.

Hypertension Service Availability

This study found that hypertension health services are available in Jos-North LGA community pharmacies; however, the practice of hypertension detection is less prevalent than the management of clients already on hypertension medications. This study emphasizes the vital role community pharmacies play in opportunistic hypertension-related care. The findings, indicating fewer hypertension detection services compared to management services, align with the report by Albasri and colleagues (2020) [19], which noted that community pharmacies in England focus more on disease management. In contrast, Ihekoronye and Osemene (2022) [9] ranked hypertension screening as the second most important service, just after malaria treatment, among community pharmacies in Southwestern Nigeria. The differences in results between the two studies may stem from variations in their focus. The present study concentrated solely on hypertension services, whereas the latter examined the provision of primary health care services, encompassing a range of health conditions beyond hypertension. This broader scope in Ihekoronye and Osemene's study in 2022 [9] may have influenced the ranking of hypertension screening, suggesting that the context of service delivery can significantly affect findings. The study highlights community pharmacies' essential role in providing medicines and care for patients with hypertension. Nonetheless, there is an opportunity to enhance their role in hypertension detection to improve overall care as research indicates that undiagnosed hypertension is high in Nigeria [5]. Regular screenings can lead to early diagnosis and timely referrals for further medical evaluation.

Resources Preparedness for Hypertension Service

The study reveals that community pharmacies in Jos-North LGA, Nigeria, are well-equipped to provide hypertension services, boasting adequate consultation spaces, available sphygmomanometers, access to treatment guidelines, and availability of first-line medicines like diuretics and calcium channel blockers. However, significant gaps remain, particularly in collaboration with health facilities, referral processes, and client record maintenance. These findings align with the earlier work by Ihekoronye and Osemene (2022) [9], which noted similar issues of poor documentation in community pharmacies across Southwestern Nigeria, highlighting a broader challenge in healthcare delivery that jeopardizes patient safety and care quality. Furthermore, the observed deficiencies in collaboration and referral systems between community pharmacies and hospitals are not unexpected, given that community pharmacies are not integrated into Nigeria's national healthcare referral framework [9, 20]. The lack of formal partnerships between community pharmacists and physicians presents a considerable barrier to effective hypertension management and overall health outcomes [10]. Addressing these gaps is crucial for effectively integrating community pharmacies into the healthcare system to improve hypertension care and outcomes.

The study revealed that diuretics and calcium channel blockers are readily available in community pharmacies while angiotensin-II-converting enzyme inhibitors (ACEIs) and angiotensin-II receptor blockers (ARBs) are less accessible. This pattern aligns with findings by Whelton and colleagues [21], which suggest that diuretics and calcium channel blockers are more effective for black hypertensive patients.

In contrast, the findings of this study highlight a more favorable availability of hypertension medications than reported by Orji and colleagues [7], who noted a shortage of such medicines in primary healthcare centers in Abuja. The discrepancies in medication availability can be attributed to differences in the study settings. This study focused on community pharmacies, which are privately run and primarily oriented towards ensuring the availability of medicines. In contrast, the previous study examined public sector primary healthcare centers, which often face bureaucratic challenges that can impede their operational efficiency. The findings regarding medication availability in this study serve as a facilitating factor for integrating community pharmacies into the primary healthcare system for hypertension management. With a solid stock of essential antihypertensive medications, community pharmacies can effectively complement existing healthcare services, providing timely access to treatment and enhancing patient care.

This study highlights a significant gap in staffing at community pharmacies, particularly in the number of CHEW/JCHEW staff. While the community pharmacies meet the minimum requirement for pharmacists (at least 1), they fall short in the quantity of at least 4 community health extension workers (CHEWs) and/or junior community health extension workers (JCHEWs) [18]. This contrasts with the report by Orji and colleagues, which suggests that primary health centers in Abuja have a sufficient number of CHEWs/JCHEWs, although they may lack more skilled staff. This

discrepancy could point to varying staffing models and needs between community pharmacies and primary health centers. It raises important questions about how workforce distribution impacts service delivery in different healthcare settings. Addressing the shortages of CHEW/JCHEW staff in community pharmacies could enhance their ability to provide comprehensive care, especially in underserved areas.

Community Pharmacists' Competency for Hypertension Services

This study's findings suggest that while some community pharmacists have foundational training, significant gaps remain in their understanding of critical hypertension management practices. Less than 80% of the community pharmacists had good hypertension knowledge competency. This contrasts with the findings by Abah and colleagues (2014) [22], who reported that over 90% of pharmacists in Jos had good hypertension knowledge. The quality of hypertension health service and outcomes depends partly on the knowledge competency of the clinician [23]. This calls for enhanced training programs to improve the identified knowledge deficiencies that may affect service delivery in hypertension care within community pharmacies.

Limitations of the Study:

This study has several limitations that should be considered when interpreting its findings. Conducted in a single Local Government Area (Jos-North LGA), the results may not be generalizable to other regions in Nigeria. The cross-sectional design provides only a snapshot of the current situation, without capturing temporal or seasonal variations. Reliance on self-reported data from community pharmacists introduces potential social desirability and recall biases. The assessment of pharmacists' competency, based solely on knowledge tests, lacks direct observation of practice, which could have provided a more comprehensive evaluation. Additionally, the study did not explore patients' perspectives on service quality, analyze the impact of factors such as pharmacy ownership and location on service provision, or assess the economic aspects of providing hypertension services in community pharmacies. These limitations highlight areas for future research to enhance our understanding of community pharmacy-based hypertension services in Nigeria.

5. CONCLUSION

In conclusion, community pharmacies in Jos-North LGA, Nigeria, play a crucial role in dispensing medications and managing care for individuals with hypertension. However, they currently provide limited disease screening services. The infrastructure is largely in place, with pharmacists, essential medications, consultation spaces, sphygmomanometers, and treatment guidelines available. Nonetheless, challenges such as a shortage of support staff, insufficient collaboration with hospitals, client record maintenance and gaps in pharmacists' knowledge about hypertension management hinder comprehensive care.

To enhance hypertension care, targeted solutions are needed. Specialized training for community pharmacists, financial support for hiring additional staff, and better integration into national referral systems would strengthen the role of community pharmacies in primary healthcare delivery. Addressing these gaps could significantly improve hypertension diagnosis and management in Jos-North LGA and similar regions.

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