

Knowledge of, Perception towards and Willingness to Uptake Artificial Intelligence for Hypertension Management among Retired Primary School Teachers in Ibadan Metropolis, Oyo State, Nigeria

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ABSTRACT

Background: Hypertension remains a cause of morbidity and mortality, yet its management among retired populations is inadequate. Artificial Intelligence (AI) has emerged as a potential tool for the management of hypertension.

Objectives: The study assessed knowledge of, perception towards and willingness to adopt AI tools for hypertension management among retired primary school teachers.

Methods: A survey design was employed. Data were collected using a questionnaire administered to 50 primary school retired teachers in Ibadan Metropolis. An engaged registered nurse measured respondents' blood pressure to confirm hypertensive status. Data were analysed descriptively.

Results: Respondents demonstrated high knowledge of AI. 90.0% knew that AI tools could monitor blood pressure, 88.0% knew that AI tools could provide lifestyle recommendations, 86.0% recognised the need for digital skills, and 80.0% knew that wearable devices could be linked to AI. A positive attitude was observed, with a weighted mean of 2.73. They all agreed that AI could detect complications, support lifestyle changes, and improve medication adherence, although some expressed concerns about accessibility, trust, and reliance on AI. Willingness to uptake AI was also recorded with a mean score of 3.69

Conclusions: Retired Primary School Teachers demonstrated adequate knowledge, positive perception towards and willingness to uptake AI-based for hypertension management. Awareness campaigns, training, and access to user-friendly AI tools are recommended to strengthen willingness to uptake and support effective adoption among older adults in Nigeria.

Keywords: Artificial Intelligence, Hypertension Management, Knowledge, Perception, Retired Primary School Teachers

INTRODUCTION

Hypertension is among the most significant public health challenges of the 21st century, particularly in ageing

populations. Hypertension is known as the "silent killer" because it is asymptomatic until severe complications arise, leaving many unaware of their hypertensive status until they suffer a stroke, heart attack, or kidney disease (Dzudie *et al.*, 2021). Worldwide, hypertension is the major cause of mortality and disability, notably contributing to cardiovascular, renal, and cerebrovascular diseases. According to the World Health Organisation (WHO), recent estimation approximately 1.4 billion adults aged 30–79 years are living with hypertension globally (WHO, 2025). African Region bears one of the highest burdens, with higher number of adults affected, while awareness, treatment and control rates remain among the lowest worldwide. Despite being highly preventable and treatable, delay in detection and poor disease control continue to cause substantial illness and death, placing immense strain on healthcare systems, families, and individuals (WHO, 2025).

In Nigeria, hypertension is one of the most common non-communicable diseases (NCDs) and a leading cause of premature death (WHO, 2025). Prevalence rates are estimated to range from 28% to 38%, with notable disparities between urban and rural areas (Adeloye *et al.*, 2022). Rapid urbanization, driving lifestyle changes such as decreased physical activity, higher intake of processed foods and salt, alcohol consumption, tobacco use, and poor stress management are associated with increasing rate of hypertension in our society (Addo *et al.*, 2007; Oladapo *et al.*, 2018). Although standard treatment protocols exist, control rates remain unsatisfactory. Data from high-income countries showed that 43.5% of patients in the United States achieved controlled blood pressure, and figures even lower in Japan (25%) and China (13.8%) (Yano *et al.*, 2017). The situation in sub-Saharan Africa, including Nigeria, is far more worrying due to limited awareness, insufficient screening, poor adherence to treatment, and weak healthcare infrastructure (Ataklte *et al.*, 2015). Consequently, millions of Nigerians live with uncontrolled hypertension, significantly increasing their risk of premature death (Iyalomhe and Iyalomhe, 2010).

Certain occupational groups are disproportionately affected by hypertension. Teachers, for example, face work-related risk factors such as long working hours, high stress, limited physical activity, and irregular diets (Wali *et al.*, 2019). Over the course of their career, they accumulate significant occupational stress, which often persists into retirement and predisposes them to cardiovascular diseases. Hypertension thus carries an even greater burden among older adults, including retirees (Adeloye *et al.*, 2021; WHO, 2023). Ageing further exacerbates these risks due to natural physiological changes that increase susceptibility to cardiovascular complications, ultimately affecting overall quality of life. For these retirees, hypertension is not only a medical condition but also a socioeconomic and psychological burden. Retirement compounds their vulnerability, as declining income, reduced access to healthcare, and limited social support make disease management more challenging. Many individuals with hypertension remain unaware of their condition, reducing opportunities for early diagnosis, timely treatment, and effective blood pressure control (Ataklte *et al.*, 2015). Evidence from a Nigerian quasi-experimental study demonstrated that a structured health education intervention significantly improved hypertension-related knowledge, preventive behaviours, and self-care practices among retirees (Ozoemena *et al.*, 2019), underscoring the critical need for accessible and innovative management strategies tailored to this population.

The prevalence technological innovations, particularly Artificial Intelligence (AI), are gaining attention as promising solutions to chronic disease problem. AI is system programmed for carrying out tasks that can be originally done by human intelligence. In hypertension management, AI applications are vast; predictive algorithms, analyse patient data to identify high-risk individuals for early intervention, machine learning models enhance diagnostic accuracy by recognising complex patterns in large datasets (Esteva *et al.*, 2019); wearable devices and mobile health applications monitor blood pressure in real time, send medication reminders, and support lifestyle modifications. Furthermore, telemedicine platforms improve access to care, especially for those in remote or underserved areas (Alami *et al.*, 2020).

Globally, research evidence showed the positive impact of AI in managing chronic diseases. For instance, AI-powered predictive diagnostics have lowered hospital readmissions among elderly hypertensive patients, while

mobile health applications have significantly enhanced adherence to treatment regimens (Topol, 2019). However, the benefits of AI are not shared equally, in low- and middle-income countries (LMICs), including Nigeria. AI's adoption remains limited as a result of infrastructural, economic, and social obstacles. Addressing barriers such as digital literacy is crucial to motivating healthcare providers and patients to engage with AI tools.

Despite the growing application of artificial intelligence in healthcare, little is known about the knowledge and attitudes of retired primary school teachers in Nigeria regarding the utilisation of AI for hypertension management. This gap in the literature underscores the need for empirical investigation among this population. Although teachers often possess relatively higher educational attainment than many of their peers, this advantage does not automatically translate into an understanding of emerging digital health innovations as most retirees are more familiar with conventional methods, such as physical blood pressure monitors and periodic hospital visits, than with AI-driven systems (Okafor *et al.*, 2021; Olagoke, 2021). While some may recognise basic mobile health applications, a deeper comprehension of AI's role in predictive diagnostics and personalised, data-driven self-management remains underdeveloped (Eze *et al.*, 2020). This lack of direct experience results in a low baseline of practical knowledge, which acts as a primary barrier to adoption.

The willingness of primary School Teachers to adopt AI for managing hypertension are complex and heavily influenced by their knowledge base, perceived usefulness, and trust. On one hand, many retired teachers hold an optimistic view of AI's potential to simplify their lives, seeing clear benefits in features like automatic blood pressure logging and personalised health insights that reduce the need for frequent clinic visits (Venkatesh *et al.*, 2003). In contrast, scepticism remains a substantial negative predictor. Having lived through an era with less data transparency, many older adults conceal their medical information (Hong *et al.*, 2020). They worry about who has access to their health data, leading to a natural wariness of systems operating beyond their direct control. Furthermore, their attitudes are heavily mediated by trust in human experts; they are significantly more likely to adopt an AI tool if it is formally endorsed by their doctor, as a machine's recommendation often lacks the authority of a human physician (Alshari *et al.*, 2021). Support from digitally savvy family members can also act as a crucial mediating factor, helping to shift perception from scepticism to acceptance.

Despite the global evidence supporting AI's potential in healthcare, empirical studies focusing on its utilisation among elderly Nigerians with chronic conditions remain sparse. Most existing studies in Nigeria have broadly explored digital health adoption, with little attention paid to the unique vulnerabilities of retirees with hypertension (Adewuyi *et al.*, 2022). Retired primary school teachers in Ibadan Metropolis, while relatively well-educated, face compounding challenges, including declining incomes, inadequate health insurance, and age-related barriers to digital adoption (Ogunmola *et al.*, 2020). These realities make them a critical group for investigation, yet they remain underrepresented in both national and global scholarship.

The neglect of this population has practical consequences. Without empirical evidence on the knowledge, perception towards and willingness to adopt AI, healthcare stakeholders risk designing interventions that exclude those most in need. Exploring these predictors is therefore essential for advancing digital health equity and ensuring that AI-driven solutions are age-sensitive, culturally relevant, and accessible. Therefore, this study examined the knowledge of, perception towards and willingness to adopt Artificial Intelligence in hypertension management among retired primary school teachers in Ibadan Metropolis.

Three research questions guided the study. They are:

1. What is the level of knowledge of AI applications for hypertension management among retired primary school teachers in Ibadan Metropolis?
2. What is the perception of retired primary school teachers in Ibadan Metropolis towards the use of AI-based for hypertension management?

3. What is the willingness of retired primary school teachers in Ibadan Metropolis to use AI-based for hypertension management?

METHODOLOGY

Descriptive survey design was used to determine knowledge of, perception towards and willingness to uptake Artificial Intelligence (AI) tools among retired primary school teachers in Ibadan Metropolis, Nigeria. The target population comprised retired primary school teachers clinically diagnosed with hypertension and residing within the Ibadan Metropolis. A sample of 50 respondents were drawn using a multi-stage sampling procedure. At the first stage, a simple random sampling technique was used to select five retirees' meeting centres in the Local Government Headquarters in Ibadan Metropolis. In the second stage, the purposive sampling technique was used to select participants with a confirmed diagnosis of hypertension. A simple random sampling technique was used to select 10 respondents from each meeting centre, whose BP, as checked by the engaged registered nurse, was between systolic >140 and diastolic >90 at the time of administering the questionnaire to reconfirm clinical eligibility. Data were collected using a structured, self-administered questionnaire designed by the researchers. The instrument consisted of four sections, capturing socio-demographic information, Knowledge of AI, Perception towards utilisation of AI and Willingness to uptake AI for Hypertension Management. The questionnaire was validated by experts in health education and behavioural sciences, and its reliability was established through a pilot test, yielding an overall Cronbach's alpha coefficient of $r = 0.88$, indicating high internal consistency. The data gathered from the administered instrument were analysed using descriptive statistics.

Table 1: Knowledge of AI applications for hypertension management among retired primary school teachers in Ibadan Metropolis, Oyo State, Nigeria

S/N	Item	Yes Freq (%)	No Freq (%)
1	Artificial Intelligence (AI) can be used to monitor blood pressure.	45(90.0)	5(10.0)
2	AI-based mobile apps can remind patients to take their medication.	39(78.0)	11(22.0)
3	AI can provide lifestyle recommendations for controlling hypertension.	44(88.0)	6(12.0)
4	AI can be used to detect early signs of complications in hypertension.	40(80.0)	10(20.0)
5	Wearable devices (e.g., smart watches, BP monitors) can be linked to AI for health management.	40(80.0)	10(20.0)
6	AI applications that connect patients with healthcare providers remotely.	38(76.0)	12(24.0)
7	AI can help reduce errors in hypertension management.	37(74.0)	13(26.0)
8	AI tools are currently available in Nigeria for managing hypertension.	35(70.0)	15(30.0)
9	AI for health requires basic digital skills (e.g., smartphone use).	43(86.0)	7(14.0)

Table 1 shows that 90.0% of the respondents have moderate knowledge of the utilisation of Artificial intelligence for monitoring blood pressure, and 88.0% knew that artificial intelligence can recommend a

lifestyle that can be used in controlling hypertension. It was also seen that 86% of the respondents possess the knowledge that Artificial intelligence for health requires basic digital skills like a smartphone, 80.0% knew that AI can be used to detect early signs of complications in hypertension and that wearable devices (e.g., smart watches, BP monitors) can be linked to AI for health management.

Table 2: Perception of Retired Primary School Teachers in Ibadan Metropolis towards the use of AI tools for hypertension management

S/N	Items	SD	D	A	SA	X	S.D
1	I regularly use my mobile phone or digital devices to monitor my blood pressure.	7(14.0)	20(40.0)	16(32.0)	7(14.0)	2.46	0.908
2	I use AI-based reminders (e.g., alarms, apps) to take my hypertension medication on time.	1(2.0)	23(46.0)	15(30.0)	11(22.0)	2.72	0.834
3	I utilize AI applications and online platforms to learn about healthy diets for blood pressure management.	5(10.0)	15(30.0)	23(46.0)	7(14.0)	2.64	0.851
4	I use wearable devices (e.g., smartwatch, digital BP monitor) linked to AI for tracking my health.	0(0)	22(44.0)	16(32.0)	12(24.0)	2.80	0.808
5	I have shared my health information from AI tools with my healthcare provider.	5(10.0)	15(30.0)	17(34.0)	13(26.0)	2.76	0.960
6	I rely on AI-based tools to track whether my blood pressure is improving or worsening.	2(4.0)	22(44.0)	14(28.0)	12(24.0)	2.72	0.882
7	I use AI-based platforms to communicate with doctors or health workers about my hypertension.	8(16.0)	5(10.0)	27(54.0)	10(20.0)	2.78	0.954
8	I have used AI tools to detect or be alerted about possible hypertension complications.	8(16.0)	5(10.0)	27(54.0)	10(20.0)	2.88	0.773
9	I use AI regularly to support lifestyle changes (e.g., exercise reminders, stress	9(18.0)	4(8.0)	27(54.0)	10(20.0)	2.76	0.981

	management apps).						
10	Overall, I depend on AI-based health technologies to help manage my hypertension.	7(14.0)	8(16.0)	24(48.0)	11(22.0)	2.78	0.954
Weighted Mean = 2.73							

Table 2 revealed that 40.0% of the respondents, with a mean of ($x=2.46$), disagreed with regular use of mobile phones or digital devices to monitor blood pressure. Also, the use of AI-based reminders (e.g., alarms, apps) to take hypertension medication on time had a disagreement rate of 46.0%, with a mean of ($x=2.72$). 46.0% of the respondents agreed to utilize AI applications and online platforms to learn about healthy diets for blood pressure management, 54.0% of the respondents, with a mean of ($x= 2.88$) use AI tools to detect possible hypertension complications; however, 44.0% of the respondents disagreed with rely on AI-based tools to track whether blood pressure it is improving or worsening, and this item has a mean of ($x=2.72$). 54.0% of the respondents use AI regularly to support lifestyle changes (e.g., exercise reminders, stress management apps), and 48.0% agreed ($x=2.78$) with depending on AI-based health technologies to help manage hypertension.

S/N	Item	SD	D	A	SA	X
1	I am willing to use artificial intelligence tools to help manage my blood pressure.	0(0)	0(0)	5(10)	45(90.0)	3.90
2	I would be willing to use an AI-powered application to monitor my blood pressure regularly.	0(0)	0(0)	10(20.0)	40(80.0)	3.80
3	I am willing to use AI-generated recommendations to improve my lifestyle for better hypertension management.	0(0)	0(0)	10(20.0)	40(80.0)	3.80
4	I would be willing to use an AI system that reminds me to take my prescribed hypertension medication.	0(0)	0(0)	13(26)	37(74.0)	3.74
5	I would be willing to consult an AI-enabled health platform for information about hypertension management.	0(0)	0(0)	10(20.0)	40(80.0)	3.8
6	I would be willing to use AI technology to identify changes in my blood pressure that may require medical attention.	0(0)	1(2.0)	20(40.0)	29(58.0)	3.56
7	I would be willing to learn how to use an AI-based tool designed for hypertension management.	2(4.0)	0(0)	18(36.0)	30(60.0)	3.52
8	If an AI-based hypertension management service were available to me, I would be willing to use it.	0(0)	0(0)	5(10.0)	45(90.0)	3.90
9	I would recommend the use of AI-based hypertension management tools to other retired teachers if I found them useful.	0	0	30(60.0)	20(40.0)	3.40
10	I intend to use artificial intelligence for managing my blood	0(0)	0(0)	25(50.0)	25(50.0)	3.50

	pressure in the future.					
	Weighted Mean 3.69					

Table 3 Willingness to uptake AI for Hypertension Management by the Retired Primary School Teachers

Table 3 revealed that 90.0% of the respondents, with a mean of ($x=3.9$), agreed on their willingness to use AI tools to monitor blood pressure. Also, 60% of the respondents are willing to learn AI tools for the management of hypertension, while 4% disagree with learning AI tools. An overall grand mean of 3.69 indicates that, on average, respondents lean strongly toward "Agree" or "Strongly Agree" regarding the adoption of AI health tools. Items 1 and 8 recorded the highest mean scores ($X = 3.90$). This suggests that the respondents have a high level of general openness to AI-based hypertension management, provided the service is available and framed as a helpful tool. Items 2, 3, 4, and 5 (Means ranging from 3.74 to 3.80) indicate strong willingness to use AI for specific, supportive tasks: regular monitoring, lifestyle recommendations, medication reminders, and accessing health information. While still positive, the lowest mean scores were observed in Items 9, 10, 6, and 7 (Means ranging from 3.40 to 3.56).

The Learning Barrier, Willingness to learn how to use an AI-based tool, scored 3.52. This indicates greater variability in responses. For some older adults, the perceived complexity or effort required to learn new technology acts as a barrier. Trust and Advocacy, Willingness to recommend the tool to other retired teachers ($X = 3.40$) was the lowest. This suggests a cautious, evidence-based approach, respondents are willing to try the technology themselves but prefer to personally verify its safety and efficacy before advocating for it within their peer network. Similarly, trusting AI to identify medical changes requiring attention ($X = 3.56$) shows a slight reservation about delegating critical medical judgment to an algorithm.

DISCUSSION OF FINDINGS

The result of this study indicates that retired primary school teachers in Ibadan Metropolis generally possess a high level of knowledge and a positive perception toward the utilisation of Artificial Intelligence (AI) for hypertension management. This suggests that most retired teachers are knowledgeable about the potential of AI to support hypertension care through continuous monitoring, personalised feedback, and early detection of complications. This result aligns with findings from Ajayi *et al.* (2021) and Okafor *et al.* (2021), that awareness of AI in health management is increasing among educated urban populations in Nigeria, especially those with prior exposure to digital technologies. The high level of knowledge observed in this study could be attributed to the respondents' educational background and lifelong engagement with information dissemination as teachers, which enhances their cognitive adaptability and openness to innovation (Ogunyemi *et al.*, 2022). Furthermore, Topol (2019) emphasised that AI-based health tools can empower patients by providing personalised insights and facilitating proactive disease management concepts that appear to be well understood by the respondents.

However, it is noteworthy that only 70.0% of respondents were aware that AI tools for managing hypertension are currently available in Nigeria. This limited awareness of local availability may hinder actual utilisation, as Adewuyi *et al.* (2022) observed that many Nigerians perceive AI as futuristic or inaccessible. Therefore, despite the good knowledge base, practical implementation might still be constrained by infrastructural gaps, lack of access, or inadequate sensitisation on locally relevant AI solutions.

The study also reveals a generally positive perception towards uptake of AI for hypertension management; complementing this, Lee and Coughlin (2015) found that positive perception among older adults are often linked to perceived usefulness and self-efficacy in technology use. Similarly, Venkatesh *et al.* (2003) posited in the Technology Acceptance Model (TAM) that perceived ease of use and perceived usefulness are strong predictors of positive attitude and behavioural intention toward technology adoption. The teachers' openness to

using AI applications may therefore be explained by their belief in AI's practical benefits for managing hypertension. Despite the overall positive disposition, some respondents still showed reluctance to depend solely on AI tools, preferring conventional health monitoring methods. This was corroborated by Hong *et al.* (2020), that older adults often experience mistrust of AI systems due to perceived complexity, data privacy concerns, and a lack of direct human interaction. Nonetheless, the significant proportion of respondents who use or express willingness to use AI technologies demonstrates a progressive acceptance trend that can be strengthened through training, awareness, and policy support.

The finding aligns with the World Health Organization's position that artificial intelligence can support health management and enable individuals to take a more active role in their care, provided that safety, transparency, privacy, and human oversight are safeguarded (WHO, 2021). WHO specifically emphasizes that AI should protect human autonomy, ensure that people understand the role of AI in their care, and maintain privacy and confidentiality through appropriate consent and data-protection frameworks (WHO, 2021). The high level of willingness observed among retired primary school teachers suggests a favourable foundation for introducing AI-supported hypertension management in this population. However, willingness should be translated into practical readiness through hands-on demonstrations, digital-skills training, and dependable access to suitable devices and internet connectivity. These measures may reduce barriers related to digital literacy and technology confidence, thereby improving the likelihood of sustained use. However, willingness to uptake AI does not necessarily translate into actual utilisation, adherence, or improved clinical outcomes. Future studies should therefore examine real-world adoption, usability, data privacy concerns, and the effect of AI-supported interventions on blood-pressure control and other hypertension-related outcomes (WHO, 2021).

In summary, the findings show that retired primary school teachers possess adequate knowledge and a positive perception toward uptake of AI for hypertension management. However, to translate these perceptions into consistent behaviour, targeted digital literacy programmes, user-friendly AI tools, and health education campaigns are necessary. These interventions would help bridge the gap between knowledge and practical adoption, ultimately improving hypertension management outcomes among older adults in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study investigated the knowledge of, perception towards and willingness to uptake AI for hypertension management among retired primary school teachers in Ibadan Metropolis. The findings revealed that the respondents demonstrated a generally high level of knowledge, a positive and willingness to uptake AI for monitoring blood pressure, provide lifestyle recommendations, and detect early signs of complications. However, despite this awareness, many respondents expressed moderate reliance on AI, indicating that practical adoption may still be limited by factors such as digital literacy, accessibility, and trust in technology. The study concludes that educational attainment and exposure to digital tools among retired teachers significantly enhance their understanding and openness toward AI-based healthcare solutions. This suggests that expanding digital health education and providing user-friendly AI platforms can improve chronic disease management among older adults in Nigeria.

Based on these findings, the following recommendations are made:

1. **Digital Literacy Training:** Government agencies, healthcare providers, and pension associations should collaborate to organise periodic digital health training sessions for retirees, focusing on using AI-enabled applications for hypertension monitoring and management.
2. **Awareness Campaigns:** Public health educators should design awareness programmes to promote the benefits, safety, and accessibility of AI technologies for disease management among older adults.

3. User-Centred AI Tools: Technology developers should ensure that AI health applications are designed with simple interfaces, local languages, and visual aids suitable for older users.
4. Integration with Health Services: The Ministry of Health should encourage integration of AI-based monitoring systems into routine healthcare services for retirees to promote continuity of care and early detection of hypertension complications.

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