

Access to and utilization of the National Health Insurance Scheme among older adults attending geriatric clinics in tertiary hospitals in Abuja, Nigeria: a descriptive cross-sectional study

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Abstract

Background

The National Health Insurance Scheme (NHIS) is Nigeria's principal mechanism for pooling healthcare risk and reducing out-of-pocket expenditure, and is central to national progress toward Universal Health Coverage (UHC). Older adults, who carry a disproportionate burden of chronic disease and frequent hospital attendance, are a priority beneficiary group, yet evidence on their access to and utilization of NHIS in Nigeria remains sparse. This study examined awareness, access, enrolment and utilization of NHIS, and the factors associated with utilization, among older adults attending geriatric clinics in tertiary hospitals in Abuja.

Methods

A descriptive cross-sectional survey was conducted among 111 adults aged 65 years and above attending the geriatric clinics of the University of Abuja Teaching Hospital, Gwagwalada, and the Federal Medical Centre, Jabi, Abuja. Sample size was determined using the Cochran formula and participants were selected through a multi-stage sampling technique combining purposive selection of hospitals with simple random sampling of eligible clinic attendees over one month. Data were collected with an interviewer-assisted, structured, validated questionnaire (Cronbach's alpha = 0.66) and analyzed in IBM SPSS version 26/27 using descriptive statistics, the chi-square test of association, and binary logistic regression. Statistical significance was set at $p < 0.05$.

Results

Most participants (mean age 70.4 ± 6.3 years; 66.7% female) were aware of NHIS (82.9%), had access to some form of health insurance (67.6%), were currently enrolled in NHIS (66.7%), and were actively utilizing NHIS-covered services (65.8%). The commonest services accessed were consultation (98.6%), medicines (93.2%) and investigations (90.4%), while inpatient care (15.1%), major surgery (13.7%) and imaging (2.7%) were rarely utilized. Barriers to enrolment and use included distance to registration centres (81.1%), non-coverage of required services (83.8%), long waiting times (86.5%), drug unavailability (62.2%) and unfavourable staff attitudes (57.7%). Utilization of NHIS was significantly associated with age ($\chi^2 = 8.565$, $p = 0.014$), educational attainment ($\chi^2 = 17.818$, $p = 0.001$), employment status ($\chi^2 = 26.426$, $p < 0.001$), monthly income ($\chi^2 = 19.775$, $p = 0.001$), access to insurance ($\chi^2 = 85.791$, $p < 0.001$), awareness ($\chi^2 = 44.038$, $p < 0.001$) and enrolment status ($\chi^2 = 16.618$, $p < 0.001$). On logistic regression, having no formal education, being a retiree without pension, earning below ₦100,000 monthly, lacking access to insurance, lacking awareness of NHIS, and not being enrolled independently predicted non-utilization. Most participants (84.9%) rated NHIS services as good.

Conclusions

Awareness, access, enrolment and utilization of NHIS among older adults attending geriatric clinics in Abuja were higher than national averages reported for the general population, but structural barriers, distance to registration centres, restricted service coverage, long waits and workforce attitudes, continue to constrain the scheme's protective potential. Socioeconomic disadvantage remains the strongest driver of non-utilization. Expanding premium-free, tax-funded coverage for older adults, decentralizing registration, and strengthening service quality at accredited facilities are needed to translate high awareness into equitable, sustained utilization.

Trial registration:

Not applicable.

Background

The world's population is ageing at an unprecedented rate. The World Health Organization (WHO) projects that the number of people aged 60 years and above will rise from roughly 900 million in 2015 to about 2 billion by 2050, with the steepest relative increase occurring in low- and middle-income countries [1]. Nigeria mirrors this trajectory: the population aged 60 and above was projected to grow from 4.5 million in 2015 to 11.5 million by 2030 [2], placing sustained pressure on a health system that is already strained. Ageing is accompanied by a rising burden of multimorbidity and functional decline, both of which increase the frequency and cost of healthcare contact and make financial risk protection an urgent priority for this group [3].

Out-of-pocket payment remains the dominant mode of healthcare financing in Nigeria and is a well-documented driver of catastrophic expenditure and impoverishment [4]. The National Health Insurance Scheme (NHIS), established under Act 35 of 1999 and operational since 2005, was designed to pool this risk through a pre-payment model in which contributions from enrollees and employers fund care purchased on their behalf by Health Maintenance Organizations. Despite this intent, national coverage has historically been low: fewer than 5% of Nigerians were enrolled in the scheme's first decade, with the burden falling disproportionately on formal-sector workers while the roughly 90% of the workforce in informal employment, among whom older adults are over-represented, remained largely excluded [5, 13]. More recent official figures suggest coverage has since expanded substantially, with the National Health Insurance Authority reporting population coverage approaching 54% and active membership above 16 million by mid-2022 [10], although independent verification of these figures at the level of vulnerable subgroups such as older adults is limited.

Financing mechanisms alone do not guarantee protection unless they are matched by adequate awareness, accessible enrolment pathways, and service delivery that meets the specific needs of older users. Regional evidence, largely from Ghana's National Health Insurance Scheme, indicates that

enrolment and retention among older people are shaped by a combination of predisposing factors (age, sex, marital status, education), enabling factors (income, employment, distance to registration points) and need factors (chronic illness, self-rated health) [8, 17, 18, 21, 22, 23, 24]. Whether these same patterns hold for older Nigerians navigating NHIS, particularly those with the complex, continuous care needs typical of geriatric clinic attendance, has not been well characterized. Existing Nigerian studies have tended to examine general adult or civil-servant populations rather than older adults specifically, and few have been conducted in tertiary hospital geriatric clinics, where the intensity of healthcare need is highest [14, 15, 16, 19].

This gap limits the ability of hospital administrators and policymakers to design interventions that are calibrated to the realities of older NHIS users. The present study therefore examined the level of awareness, the proportion with access, the enrolment rate, and the level of utilization of NHIS among older adults attending geriatric clinics in two tertiary hospitals in Abuja, and identified the sociodemographic and scheme-related factors independently associated with utilization. The findings are intended to inform targeted reforms that improve financial protection and health outcomes for this priority population as Nigeria works toward Universal Health Coverage [6].

Methods

Study design, setting and population

This was a descriptive cross-sectional survey conducted among older adults attending geriatric clinics at two purposively selected tertiary hospitals in Abuja, Federal Capital Territory, Nigeria: the University of Abuja Teaching Hospital (UATH), Gwagwalada (520-bed capacity, expandable to 800 beds), and the Federal Medical Centre (FMC), Jabi (238-bed capacity). Both hospitals run dedicated geriatric clinics, managed by family medicine physicians, that serve as referral points for patients aged 65 years and above from across the Federal Capital Territory and surrounding states. The geriatric clinics at UATH and FMC Jabi see approximately 200 and 80 older patients per month, respectively, of whom about 116 and 40 attend during the study clinic days each month.

Sample size and sampling technique

The minimum sample size was determined using the Cochran formula for an unknown population proportion ($Z = 1.96$ for a 95% confidence level, $p = 0.5$, $d = 0.05$ margin of error), yielding a base estimate of 384, which was then adjusted for the finite monthly clinic population of 156 older adults across both sites using the finite population correction, giving a minimum required sample of 111. Participants were allocated proportionally between sites (82 at UATH, 74.9%; 29 at FMC Jabi, 26.1%). A multi-stage sampling technique was used: hospitals were selected purposively, and eligible clinic attendees were then selected by simple random sampling from the daily clinic list on each clinic day over a one-month data collection period (UATH clinic days: Mondays and Wednesdays; FMC Jabi clinic day: Thursdays).

Inclusion criteria were age 65 years or older, attendance at the geriatric clinic of either study hospital, and willingness to participate. Patients younger than 65 years, those not attending the selected clinics, and those unwilling to participate were excluded.

Data collection instrument

Data were collected using an interviewer-assisted, structured, closed-ended questionnaire developed by the research team, comprising five sections: (A) sociodemographic characteristics; (B) awareness of NHIS; (C) access to health insurance; (D) enrolment status; and (E) utilization of and barriers to NHIS. Content and face validity were established through expert review by the study supervisors and three additional reviewers from the Faculty of Nursing and Allied Health Sciences, University of Abuja, who assessed the instrument for clarity, relevance to the study objectives, and coverage of the constructs of interest. Reliability was assessed through a pilot administration to older adults attending the geriatric clinic of the National Hospital, Abuja (a non-study site), yielding a Cronbach's alpha of 0.66; the Spearman–Brown prophecy formula was additionally applied to estimate split-half reliability. Data collectors were trained to ensure consistency of administration.

Data collection procedure

Following ethical approval and administrative clearance from the participating hospitals, the principal investigator and two trained research assistants approached eligible patients on clinic days over one calendar month. After establishing rapport and explaining the purpose, procedures and confidentiality safeguards of the study, written informed consent was obtained from each willing participant before the questionnaire was administered.

Statistical analysis

Data were cleaned, coded and analyzed in IBM SPSS Statistics (versions 26 and 27). Continuous variables (e.g., age) were summarized as means and standard deviations; categorical variables were summarized as frequencies and percentages. Awareness was additionally classified using a pre-specified scoring scale (low, 0–49%; moderate, 50–69%; high, 70–100%). Bivariate associations between utilization of NHIS and sociodemographic and scheme-related variables were tested using the chi-square test of independence. Variables significant at the bivariate level were entered into a binary logistic regression model to identify independent predictors of utilization, with results expressed as odds ratios (OR) and 95% confidence intervals (CI). Statistical significance was set at $p < 0.05$ throughout.

Ethical considerations

Ethical approval

was obtained from the Health Research Ethics Committee of the University of Abuja Teaching Hospital, Gwagwalada. All participants provided informed consent prior to enrolment, participation was entirely voluntary with no penalty for withdrawal at any stage, and confidentiality and anonymity were maintained throughout, including omission of participant names from questionnaires.

Results

A total of 111 older adults who met the eligibility criteria and consented to participate were recruited across the two study sites (82 from UATH, 73.9%; 29 from FMC Jabi, 26.1%).

Sociodemographic characteristics

Participants ranged in age from 65 to 77 years (mean 70.4 ± 6.3 years); the modal age band was 70–74 years (48.6%), followed by 65–69 years (39.6%). Two-thirds of participants were female (66.7%). Nearly half were widowed (49.6%) and 38.7% were married. Most had attained tertiary-level education (78.4%), while 5.4% had no formal education. The majority identified as Christian (71.2%) and the remainder as Muslim (28.8%). Approximately half were retired pensioners (49.6%), 38.7% were self-employed, and 11.7% were retirees without a pension. The most common monthly income band was ~~₦~~50,000–~~₦~~99,000 (34.2%). Full sociodemographic details are shown in Table 1.

Table 1
Sociodemographic characteristics of study participants (N = 111)

Variable	Category	n	%
Age group (years)	65–69	44	39.6
	70–74	54	48.6
	75–79	13	11.7
	Mean $\pm$ SD (range)	70.4 $\pm$ 6.3 (65–77)	
Sex	Male	37	33.3
	Female	74	66.7
Marital status	Married	43	38.7
	Separated/divorced	13	11.7
	Widowed	55	49.6
Highest education	No formal education	6	5.4
	Primary	10	9.0
	Secondary	5	4.5
	Tertiary	87	78.4
	Postgraduate	3	2.7
Religion	Christianity	79	71.2
	Islam	32	28.8
Employment status	Retired (pensioner)	55	49.6
	Retired (no pension)	13	11.7
	Self-employed	43	38.7
Average monthly income (₦)	None	2	1.8
	< 20,000	3	2.7
	20,000–49,000	31	27.9
	50,000–99,000	38	34.2
	100,000–199,000	30	27.0
	$\geq$ 200,000	7	6.3

SD, standard deviation; n, number of participants.

Awareness, access, enrolment and utilization

Most participants (82.9%) reported awareness of NHIS, corresponding to a high level of awareness on the pre-specified scale; the remainder (17.1%) were unaware. Health workers were the leading source of information (63.1%), followed by family or friends (18.5%), television or radio (5.4%), NHIS offices or Health Maintenance Organization (5.4%), and print media (4.3%). Among those aware, 80.4% were principal enrollees, 10.9% were enrolled as spouses, and 8.7% as additional dependants.

Two-thirds of participants (67.6%) reported access to some form of health insurance, distributed across organizational insurance (32.0%), Federal Capital Territory health insurance (30.7%), National Health Insurance (29.3%) and private insurance (8.0%). Enrolment in NHIS specifically stood at 66.7%, with the remaining 33.3% not enrolled. Among enrollees, 64.8% had been enrolled for more than six years, and enrolment was most commonly obtained through an employer (64.8%). The enrolment process was rated very easy or easy by 43.2% of enrollees, neutral by 33.8%, and difficult or very difficult by 23.0%. The leading self-reported barriers to non-enrolment among those not enrolled were financial constraints (75.7%), a difficult registration process (67.6%), distrust of the scheme (45.9%), and lack of awareness (37.8%).

Nearly two-thirds of participants (65.8%) were actively utilizing NHIS-covered services. Among these, consultation (98.6%), medicines (93.2%) and investigations (90.4%) were the most frequently utilized services, while dental care (56.2%) and eye examinations or glasses (53.4%) were moderately utilized, and inpatient care (15.1%), major surgery (13.7%), wound dressing (6.8%) and imaging such as MRI (2.7%) were rarely accessed. Most utilizing participants (86.3%) used their NHIS card as the need arose rather than on a fixed schedule, and 84.9% rated the quality of NHIS-rendered services as good, with a further 6.9% rating services as very good or excellent. A summary of these findings is presented in Table 2.

Table 2
Awareness, access, enrolment and utilization of NHIS among study participants (N = 111)

Variable	n	%
Aware of NHIS	92	82.9
Has access to any form of health insurance	75	67.6
Currently enrolled in NHIS	74	66.7
Currently utilizing NHIS-covered services	73	65.8
Rated NHIS services as good or better	67	91.8 (of utilizers)

NHIS, National Health Insurance Scheme; n, number of participants.

Barriers to enrolment and utilization

Structural barriers to enrolment were reported by a substantial minority to majority of participants: distance to the NHIS-accredited registration centre or office (81.1%), a cumbersome registration process (40.5%), unaffordable premiums (10.8%), dissatisfaction with the quality of care under NHIS (9.9%), and a stated preference for out-of-pocket payment (8.1%). Barriers to utilization among those enrolled or accessing services were more pronounced still: long waiting times (86.5%), required services not being covered by the scheme (83.8%), unavailability of drugs (62.2%), unfavourable staff attitudes (57.7%), and prolonged waits for authorization codes (49.5%). Demands for informal extra payment (4.5%) and institutional-level restrictions (10.8%) were less frequently reported. These findings are summarized in Table 3.

Table 3
Barriers to enrolment in and utilization of NHIS among study participants (N = 111)

Barrier	n	%
Distance to NHIS-accredited registration centre	90	81.1
Required services not covered by the scheme	93	83.8
Long waiting time	96	86.5
Cumbersome registration process	45	40.5
Drugs not available	69	62.2
Unfavourable attitude of health workers	64	57.7
Prolonged wait for authorization code	55	49.5
Unaffordable premium	12	10.8
Institutional-level limitation	12	10.8
Dissatisfaction with quality of care under NHIS	11	9.9
Preference for out-of-pocket payment	9	8.1
Demand for informal extra payment	5	4.5

NHIS, National Health Insurance Scheme; n, number of participants; percentages reflect proportion of the full sample (N = 111) responding "yes" to each item.

Factors associated with utilization of NHIS

On bivariate analysis, utilization of NHIS was significantly associated with age group ($\chi^2 = 8.565$, $p = 0.014$), highest level of education ($\chi^2 = 17.818$, $p = 0.001$), employment status ($\chi^2 = 26.426$, $p < 0.001$) and average monthly income ($\chi^2 = 19.775$, $p = 0.001$), but not with sex ($\chi^2 = 2.421$, $p = 0.120$), marital status ($\chi^2 = 3.934$, $p = 0.140$) or religion ($\chi^2 = 0.213$, $p = 0.644$). Utilization was also strongly associated

with access to any form of health insurance ($\chi^2 = 85.791$, $p < 0.001$), awareness of NHIS ($\chi^2 = 44.038$, $p < 0.001$), and current enrolment status ($\chi^2 = 16.618$, $p < 0.001$). These findings are summarized in Table 4.

Table 4
Association between sociodemographic and scheme-related variables and utilization of NHIS among older adults (N = 111)

Variable	χ^2	p-value
Age group	8.565	0.014*
Sex	2.421	0.120
Marital status	3.934	0.140
Highest level of education	17.818	0.001*
Religion	0.213	0.644
Employment status	26.426	< 0.001*
Average monthly income	19.775	0.001*
Access to any form of health insurance	85.791	< 0.001*
Awareness of NHIS	44.038	< 0.001*
Currently enrolled in NHIS	16.618	< 0.001*

*Statistically significant at $p < 0.05$. NHIS, National Health Insurance Scheme.

Variables significant at the bivariate level were entered into a binary logistic regression model. No formal education ($p = 0.018$; OR 2.400, 95% CI 1.741–30.804, versus formal education), being a retiree without pension ($p = 0.005$; OR 3.600, 95% CI 2.154–35.856, versus a pensioner), average monthly income below ₦100,000 ($p = 0.002$; OR 2.333, 95% CI 0.867–4.807, versus $\geq$ ₦100,000), absence of access to any form of health insurance ($p = 0.021$; OR 1.665, 95% CI 1.079–2.569, versus having access), lack of awareness of NHIS ($p = 0.044$; OR 3.000, 95% CI 1.049–34.317, versus being aware), and non-enrolment in NHIS ($p = 0.012$; OR 0.506, 95% CI 0.298–0.861, versus being enrolled) each remained independently associated with utilization status. Age group was not retained as an independent predictor once education, employment and income were accounted for. Predictors of utilization are summarized in Table 5.

Table 5
Independent predictors of utilization of NHIS among older adults on binary logistic regression (N = 111)

Factor	p-value	OR	95% CI
No formal education (ref: formal education)	0.018*	2.400	1.741–30.804
Retired, no pension (ref: retired pensioner)	0.005*	3.600	2.154–35.856
Self-employed (ref: retired pensioner)	0.094	4.250	0.782–23.107
Income < ₦100,000 (ref: ≥ ₦100,000)	0.002*	2.333	0.867–4.807
No access to health insurance (ref: has access)	0.021*	1.665	1.079–2.569
Not aware of NHIS (ref: aware)	0.044*	3.000	1.049–34.317
Not enrolled in NHIS (ref: enrolled)	0.012*	0.506	0.298–0.861

*Statistically significant at $p < 0.05$. OR, odds ratio; CI, confidence interval; ref, reference category; NHIS, National Health Insurance Scheme.

Discussion

This study found that awareness (82.9%), access (67.6%), enrolment (66.7%) and utilization (65.8%) of NHIS among older adults attending geriatric clinics in two Abuja tertiary hospitals were considerably higher than the national coverage figures of below 5% reported for the general population in earlier assessments of the scheme [5]. This gap most plausibly reflects the setting rather than a true shift in population coverage: participants were recruited from tertiary institutions in the Federal Capital Territory, where socioeconomic status, formal-sector employment and educational attainment are higher than the national average, and where health workers, identified here as the leading source of NHIS information (63.1%), are more concentrated. Similar clinic- and urban-based Nigerian samples have reported comparably high awareness; for example, a study among adult patients attending a tertiary facility in Lagos found that awareness, while high, translated into much lower actual registration (12.3%), underscoring that awareness alone does not guarantee enrolment [14]. Our finding that awareness, access and enrolment were all more closely aligned in this sample suggests that once older adults in tertiary, urban settings become aware of the scheme, a comparatively high proportion go on to enrol and use it, in contrast to less-resourced populations.

The predominance of formal-sector, employer-mediated enrolment observed here (64.8% enrolled through an employer) is consistent with the scheme's historical design, which has served public- and formal private-sector workers far more effectively than the roughly 90% of Nigeria's workforce in informal employment [13]. Because most participants in this study were retired civil servants or pensioners, they were more likely to have been enrolled while still in service and to retain that coverage into old age, a pathway not available to older adults who spent their working lives in informal or self-employed occupations. This structural pattern was reflected in our logistic regression findings: retirees without a

pension were substantially more likely than pensioners to be non-utilizers (OR 3.600), and self-employment showed a similar, though not statistically significant, trend (OR 4.250).

Age, education, employment status and income were all significantly associated with utilization at the bivariate level, echoing the predisposing–enabling–need framework that has repeatedly explained NHIS-type enrolment and use in West African settings [8, 17, 18, 21, 22, 23, 24]. The association between older age bands and higher utilization is consistent with regional evidence that adults aged 60 years and above are more likely to enrol and use national schemes than younger age groups, plausibly reflecting both greater accumulated healthcare need and, in this sample, longer employment tenure prior to retirement [17]. Educational attainment showed a similarly strong association, in keeping with evidence that higher education improves health literacy and knowledge of insurance benefits [17], although the literature is not unanimous: some studies report an inverse or null relationship between education and enrolment [8], suggesting that the direction of this association may be context-dependent and mediated by employment type rather than education per se.

Income emerged as one of the strongest independent predictors of non-utilization, with participants earning below ₦100,000 monthly at significantly higher odds of non-utilization than higher earners. This finding is unsurprising given that only 90% of the NHIS premium is government-subsidized, leaving a residual contribution that can be prohibitive for older adults without a steady income; the finding is consistent with regional evidence that premium cost is a persistent barrier to both enrolment and renewal among poorer older adults [18, 22]. Financial constraint was also the single most frequently cited reason for non-enrolment among uncontrolled participants in this study (75.7%), reinforcing calls from the wider literature for premium-free or tax-financed coverage models for older adults, an approach already piloted in some West African schemes that exempt older people from contributions [24].

Beyond enrolment, this study identified marked gaps between formal coverage and the services older adults actually receive. While consultation, medicines and investigations were used by the overwhelming majority of enrollees, inpatient care, major surgery and advanced imaging were rarely accessed, most plausibly because these services are frequently excluded from the standard benefits package or subject to co-payment, forcing enrollees to pay out of pocket for exactly the higher-cost care that insurance is intended to protect against. This pattern mirrors findings from other resource-constrained settings, where exclusion lists for costly procedures leave insured patients only partially protected from catastrophic expenditure. Long waiting times (86.5%), non-coverage of required services (83.8%) and unfavourable staff attitudes (57.7%) were the most frequently reported barriers to utilization once enrolled, consistent with prior Nigerian evidence that health-system quality factors, rather than enrolment status alone, determine whether insurance translates into effective use of care, and that improving service quality, workforce training and patient flow is essential to sustaining enrolment [19, 20].

Distance to NHIS-accredited registration centres was reported as a barrier by over four in five participants, despite the study being conducted in the Federal Capital Territory, where administrative

infrastructure is comparatively concentrated. This finding is consistent with broader evidence that geographic and health-system access barriers, alongside affordability and quality of care, continue to constrain both enrolment and utilization of health coverage in low- and middle-income countries, disproportionately affecting older adults with reduced mobility [19]. Decentralizing registration to primary care and community levels, as recommended in prior work, could meaningfully reduce this barrier for the older population specifically.

Most participants who did use NHIS-covered services rated the quality of care received favourably (84.9% rated services as good or better), suggesting that, once older adults successfully navigate enrolment and access, their overall experience of NHIS-mediated care is broadly positive, even against a backdrop of specific, identifiable service gaps. This is an encouraging signal for policy: the barriers identified here are structural and administrative rather than reflecting fundamental dissatisfaction with the concept or delivery of insured care.

Limitations

This study has several limitations. The sample was drawn from only two tertiary hospitals in Abuja and was constrained in size by an industrial action among non-consultant health workers during the data collection period, which may limit the generalizability of findings to other regions, facility levels, or rural settings where socioeconomic and health-system conditions differ substantially. The cross-sectional design precludes causal inference and did not allow assessment of change over time. System-level data, such as the total number of NHIS-enrolled patients assigned to the study facilities, institutional policies governing NHIS-covered care, or clinical outcomes among NHIS users, could not be obtained because of the concurrent strike action. Self-administered and interviewer-assisted responses may also be subject to social desirability or recall bias.

Conclusions

Among older adults attending geriatric clinics in two Abuja tertiary hospitals, awareness, access, enrolment and utilization of NHIS were considerably higher than figures previously reported for the Nigerian population as a whole, largely reflecting the urban, tertiary-care and formerly formal-sector profile of this sample. Nonetheless, structural and service-related barriers, distance to registration centres, restricted service coverage, long waiting times, drug unavailability and unfavourable staff attitudes, continue to limit the scheme's protective value, and socioeconomic disadvantage, particularly low income, absence of a pension, and limited education, remained the strongest independent predictors of non-utilization. Realizing NHIS's potential to advance Universal Health Coverage for Nigeria's ageing population will require premium-free or tax-financed coverage options for older adults, decentralized and simplified registration processes, expanded benefit packages that include higher-cost geriatric services, and sustained investment in age-friendly service quality at accredited facilities.

Recommendations

Based on these findings, we recommend that:

1. Hospital administrators integrate health education, public awareness campaigns and point-of-care enrolment support into geriatric clinic visits.
2. The National Health Insurance Authority and government adopt a tax-financed, non-contributory or premium-free insurance model for older adults to remove cost as a barrier to enrolment and renewal.
3. Registration centres be decentralized and made more accessible at the primary care and community level to reduce distance-related barriers.
4. The benefits package be reviewed to expand coverage of high-cost services, including inpatient care, surgery and imaging, that older adults currently access least.
5. Health facility management invest in workforce training, motivation and technology-supported patient flow to reduce waiting times and improve staff attitudes toward NHIS-enrolled patients.
6. Government strengthen national coordinating structures linking older persons' representatives, line ministries and NHIS stakeholders to inform policy review and budget allocation for older-adult care.

Future longitudinal and multi-site studies with larger samples are recommended to assess the long-term impact of NHIS utilization on health outcomes among older adults and to evaluate the effectiveness of community-based enrolment campaigns.

Abbreviations

CI

Confidence interval

FMC

Federal Medical Centre

HMO

Health Maintenance Organization

NHIA

National Health Insurance Authority

NHIS

National Health Insurance Scheme

OR

Odds ratio

SD

Standard deviation

SPSS

Statistical Package for the Social Sciences

UATH

University of Abuja Teaching Hospital

UHC

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Health Research Ethics Committee of the University of Abuja Teaching Hospital, Gwagwalada, and administrative approval was obtained from the management of both participating hospitals. Written informed consent was obtained from all participants prior to enrolment.

Consent for publication

Not applicable. This manuscript does not contain any individual person's data in any form.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MUE conceived and designed the study, collected and analyzed the data, and drafted the manuscript. FAB and KTM supervised the study design, data analysis and manuscript preparation. SAA, EIO, MUB and SodiqAA contributed to instrument development, data interpretation and critical revision of the manuscript for important intellectual content. SAA wrote and reviewed the final draft. All authors read and approved the final manuscript.

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