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Abstract

Background Women living with HIV (WLWH) in low- middle-income countries (LMICs) face increased mortality risks from comorbidities despite progress in antiretroviral therapy. Palliative care (PC) is vital for these patients, yet its integration in LMICs, such as Nigeria, is suboptimal due to unique challenges.

Objective This study investigated the knowledge, perceived barriers, and facilitators influencing PC integration into routine HIV care within healthcare (HC) settings.

Methodology A cross-sectional survey was conducted among WLWH in twelve HC facilities throughout Nigeria. Data collection involved surveys focused on PC knowledge, attitudes, facilitators, and barriers. Logistic regression analyses were employed to examine the data.

Results This study revealed significant gaps in knowledge and attitudes towards PC among HIV + women at NISA-MIRCs. Over 90% were unaware of PC services, but many saw its potential to offer hope (55%) and improve quality of life (56.5%). The key predictors of PC knowledge included education, occupation, religion, having fewer children, urban residence, type of residence, and having a high income ($p < .05$). Despite the willingness to access PC, barriers such as negative HC worker attitudes, perceived high cost, and limited decision autonomy could hinder integration. Facilitators included low-cost services, positive HCW attitudes, physician recommendations, and perceived necessity

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Introduction

e combination of HIV and comorbidities, such as cancer and organ failure, presents a serious health risk [1, 2], particularly for women living with HIV (WLWH), who experience higher mortality rates from life-threatening conditions [3]. Although combination antiretroviral therapy (cART) has extended the life expectancy of people living with HIV (PLWH), especially in low- and middle-income countries (LMICs), it has also led to increased risks of long-term health issues. For WLWH, these include comorbidities related to HIV and prolonged antiretroviral use, alongside mental health challenges exacerbated by stigma and social inequities [3–8].

Palliative care has become crucial in managing life-threatening illnesses [9–14]. Palliative care is an approach that improves the quality of life for patients and their families facing life-threatening illnesses by addressing not only physical symptoms like pain but also psychosocial and spiritual needs [15, 16]. Early integration of palliative care is crucial for PLWH, who face progressive and incurable comorbidities such as organ failure, cancer and other chronic diseases [17]. Palliative care supports early identification, assessment, and treatment of these conditions, heling to reduce su ering and improve patient outcomes, particularly in regions heavily a ected by HIV [18, 19].

Women living with HIV also face poor mental health outcomes, such as depression, due to stigma, discrimination, and social inequities, making palliative care essential [5–8]. However, many WLWH with comorbidities seek healthcare late, leading to more severe symptoms and worsened quality of life [20–24]. Early detection and palliative care can improve patient outcomes and patient satisfaction, yet access remains a public health challenge [25–27]. e World Health Organization (WHO) recommends integrating palliative care into healthcare systems cost-e ectively to address this gap, but implementation in LMICs is inadequate [16, 28, 29].

Research shows varying levels of awareness and access to palliative care among women with chronic illnesses, including HIV [30, 31]. Socioeconomic factors influence palliative care knowledge, but gaps remain among patients and healthcare workers [28, 32–39]. Negative attitudes and a lack of trust in healthcare professionals also hinder palliative care delivery [36, 40–43]. Higher education, income, and being married have also been found to positively influence palliative care knowledge and access [35, 37, 44].

Systemic and cultural barriers to palliative care, such as misconceptions, inadequate education for health workers, and limited access, especially in rural areas, have also been highlighted [45–48]. Facilitators of palliative care access include training for healthcare practitioners, patient education, stakeholder engagement, financial support, and community networks [47, 48].

Our study aims to address the limited integration of palliative care into chronic disease treatment in LMICs, with a focus on Nigeria [29, 49–52]. Despite some e orts, challenges such as funding, capacity constraints, and service availability persist [53]. is research investigated knowledge gaps and perceptions of palliative care among WLWH and explored barriers to and facilitators of the integration of palliative care into routine HIV care in Nigeria.

Methods

Study area and population

is study was conducted across Nigeria's six geopolitical zones, using 12 of the 21 Nigeria Implementation Science Alliance-Model Innovation and Research Centers (NISA-MIRCs) [54], also known as implementation laboratories. Supported by PEPFAR through local partners, these facilities are part of the ICON-3 Practice-Based Research Network (ICON-3 PBRN). Linked to six Regional Centers of Excellence and the IVAN Research Institute at the University of Nigeria, the NISA-MIRCs maintain a large cohort of women and children. Our study surveyed WLWH within these 12 facilities.

Study design

We conducted a nested cross-sectional study to explore knowledge gaps, perceived barriers, and facilitators for integrating palliative care into HIV programs in Nigeria.

e study followed the Exploration, Preparation, Implementation, and Sustainment (EPIS) Framework [55, 56]. During exploration, 12 NISA-MIRC facilities across six regions were mapped. Preparation involved engagement at NISA-MIRCs and PHCs, participant selection, and stakeholder identification. e implementation included administering pretested survey instruments, whereas the sustainment focused on stakeholder engagement for continued connections.

Sample size calculation

A total of 17,075 WLWH receive care at the study facilities in the 6 geo-political zones; South South (1648), South West (2912), South East (2984), North Central (4545), North West (3934), and North East (1272). We used a priori power analysis with G*power to determine the sample size [57], setting the power at 0.80, the e ect size at 0.10, and $\alpha = 0.05$. is indicated that a total sample size of 787 participants (approximately 800) was needed.

e population proportionate to size (PPS) method was used to assign sample sizes to the NISA-MIRCs sites.

Sampling approach

A multistage sampling method was adopted. Twelve NISA-MIRCs sites involved in an NIH-funded research grant were purposively selected, covering Nigeria's six

regions (2 sites per region). Systematic sampling with a random start was used to select 800 respondents from a list of women who consented to participate. e research sta informed potential respondents and sought their consent to participate.

Data collection and management

A structured, pilot-tested questionnaire was employed to assess knowledge, perceived barriers, and facilitators of integrating palliative care into HIV programs. e researcher-administered survey was conducted with all sampled participants who provided informed consent. For those not proficient in English, local research sta who were natives of the study area and fluent in the local languages explained the concept of palliative care and verbally interpreted the survey questions. Data collection was investigator-assisted, utilizing REDCap for secure data capture and quality assurance [58].

Data analysis

Descriptive statistics summarizing demographic variables, knowledge, perceived barriers, and facilitators. e chi-square test of independence (χ^2) identified predictors of palliative care knowledge, with significance at $p<.05$. Analysis was conducted via IBM SPSS Statistics version 29.

Results

e survey results revealed a predominant concentration of individuals aged 35–44 years (37.3%), with significant proportions of women aged 25–34 years (25.1%) and 45–54 years (24.0%). e youngest [18–24] and oldest (65+) categories are few at 5.3% and 1.1%, respectively.

e North Central region has the highest representation (26.5%), and a significant proportion holds a secondary school certificate (29.3%). Traders constitute the largest occupation category (32.8%), Christianity is the dominant religion (66.9%), and urban residences are more common (65.9%). e majority (23.1%) earn ≤25,000 naira (≤19.16 USD), and most (87.5%) have 0–5 children. Close to half (46.4%) make health decisions independently, and most are at Stage 1 of their disease (82.9%). Table 1 provides a comprehensive overview of the sociodemographic characteristics of the respondents.

Table 1 Demographic characteristics of the respondents

Age	Frequency (%)
18–24	42(5.3)
25–34	201 (25.1)
35–44	298 (37.3)
45–54	192 (24.0)
55–64	58(7.3)
65 and above	9 (1.1)
Geo-political zone	
South East	139 (17.4)
South West	136 (17.0)
South South	77 (9.6)
North Central	212 (26.5)
North East	52 (6.5)
North West	184 (23.0)
Facility	
Annunciation Specialist Hospital, Emene, Enugu	101 (12.6)
Mother of Christ Specialist Hospital, Ogui, Enugu	38 (4.8)
Ijebu-ode General Hospital	98 (12.3)
General Hospital, Alimosho, Lagos State	38 (4.8)
Oron General Hospital, Oron, Akwa Ibom State	39 (4.9)
Calabar General Hospital, Calabar, Cross River State	38 (4.8)
Dalhatu Araf Specialist Hospital, La□a, Nasarawa	105 (13.1)
Faith Alive Foundation, Jos, Plateau State	107 (13.4)
Gombe State Specialist Hospital, Gombe	32 (4.0)
General Hospital, Billiri, Gombe State	20 (2.5)
Dr. Gwamna Awan General Hospital, Kaduna	114 (14.3)
General Hospital, Funtua, Katsina State	70 (8.8)
Education	
NFE (No Formal Education)	121 (15.1)
Elementary school certi□cate	111 (13.9)
Secondary school certi□cate	234 (29.3)
Technical diploma certi□cate	163 (20.4)
Undergraduate degree	147 (18.4)
Graduate degree	23 (2.9)
Occupation	
Housewife	130 (16.3)
Farmer	97 (12.1)
Trader	262 (32.8)
Teacher	67 (8.4)
Civil servant	142 (17.8)
Other	98 (12.3)
Religion	
Christian	535 (66.9)
Muslim	262 (32.8)
African traditional religion	2 (0.3)
Other	1 (0.1)
Place of Residence	
Rural	273(34.1)
Urban	527(65.9)
Type of residence	
Duplex	15 (1.9)
Bungalow	97 (12.1)
3- or 2-Bedroom Flat	274 (34.3)

Gaps in Palliative Care among WLWH assessing care at NISA-MIRCs sites

Knowledge of Palliative Care

Overall, the study results revealed that there was a greater proportion of respondents in South West Nigeria (31.2%) indicating knowledge about palliative care than in other zones. In Southern Nigeria, the proportion of respondents with knowledge of palliative care was notably greater (59.9%) than that in Northern Nigeria (9.1%).

Age	Frequency (%)
Self-contained Apartment/Residence with outdoor amenities	122 (15.3)
Other kinds of living space with external facilities	291 (36.4)
Monthly Personal Income in Nigerian Naira (USD)	
Less than or equal to 25,000 (≤ 19.16)	185 (23.1)
25,001–50,000 (19.16–38.32)	129 (16.1)
50,001–75,000 (38.32–57.48)	158 (19.8)
75,001-100,000 (57.48–76.64)	168 (21.0)
Above 100,000 (> 76.65)	158 (19.8)
Number of Children	
0–5	700 (87.5)
6 and above	100 (12.5)
Health decision autonomy	
Myself	371 (46.4)
Husband	188 (23.5)
Both of us	165 (20.6)
Friends/Relative	70 (8.8)
Stage of disease	
Stage 1	663 (82.9)
Stage 2	133 (16.6)

Specifically, 4.5% and 4.6% of the respondents in North West and North Central Nigeria, respectively, indicated knowledge of palliative care. Furthermore, 31.2%, 15.4%, and 13.3% of respondents in South West Nigeria, South Nigeria, and South East Nigeria, respectively, had knowledge of palliative care. However, there was no record of knowledge of palliative care among those in North East Nigeria. Figure 1 below illustrates the distribution of respondents' knowledge regarding palliative care across di erent geopolitical zones.

Awareness of Palliative Care services in their facilities.

Figure 2 illustrates respondents' awareness of palliative care services in their healthcare facilities across different geopolitical zones. Most respondents in all zones reported not being aware of such services, with percentages ranging from 90.4% in North East Nigeria to 98.7% in South Nigeria. Conversely, the proportion of respondents who were aware of palliative care services in their facility was low, ranging from 1.3% in North West China to 9.6% in North Central Nigeria. Overall, the majority of respondents across all zones reported a lack of awareness of palliative care services in their facility, with only a few indicating awareness.

Attitude towards Palliative Care

e examination of attitudes toward palliative care across di erent geopolitical zones revealed diverse attitudes, as shown in Fig. 3. Notably, the respondents expressed fear of referral to palliative care, with proportions varying from 9.6% in South Nigeria to 35.5% in South West Nigeria. Similarly, respondents indicated feelings of anxiety triggered by the term "palliative care," varying from 1.9% in South Nigeria to 16.7% in South West Nigeria. With respect to beliefs about palliative care, the majority of respondents across all zones perceived it as o ering hope (ranging from 42.0% in South West Nigeria to 84.6% in South Nigeria) and as potentially improving quality of life (ranging from 41.3% in South West Nigeria to 90.0% in North East Nigeria). Additionally, some believed that palliative care could alleviate pain when sick, with proportions varying from 32.6% in South West Nigeria to 71.2% in South Nigeria. Similarly, divergent attitudes were observed regarding the perception that palliative care signifies imminent death (ranging from 18.8% in North West Nigeria to 55.0% in North East Nigeria) or implies that medical professionals can no longer provide needed care (ranging from 26.6% in South East Nigeria to 84.6% in South Nigeria). ese perceptions were more nuanced and varied across di erent regions. More information on attitudes toward palliative care across the six regions in Nigeria is presented in Fig. 3.

Sociodemographic predictors of knowledge of Palliative Care

Table 2 provides a comprehensive overview of the predictors of palliative care knowledge. A chi-square (χ^2) test of independence was used to ascertain the predictors of knowledge of palliative care among women who were sampled across various sociodemographic and other health-associated variables. Specifically, respondents' educational level, occupation, religion, number of children, place of residence, type of residence and income all reached statistical significance in terms of their knowledge of palliative care ($p<.05$). Knowledge of palliative care varied by education, with higher rates among those with HND/Degree (26%) and postgraduate (30%) than among those with OND/Diploma (14%), JSC/SSCE (9%), and FSLC (5%). ose without formal education had the lowest level of knowledge. Chi-square analysis revealed significant variation ($p=.000$). Occupation also showed significant variation ($p=.000$), with civil servants (23%), teachers (19%), and traders (12%) having more knowledge than do housewives (3%) and farmers (4%). Religion was significant ($p=.023$), with Christians (13%) having more knowledge than Muslims (10%). Women with fewer children (0–5) had more knowledge (13%) than those with 6 or more children (4%), with significant variation ($p=.010$). Urban residents (15%) had more knowledge than did rural residents (5%) ($p=.000$). e type of residence was also significant ($p=.000$), with those in duplexes (53%) and bungalows (26%) showing more knowledge than those sharing spaces (4%).

Income levels significantly predicted knowledge ($p=.000$); higher earners had more knowledge, with

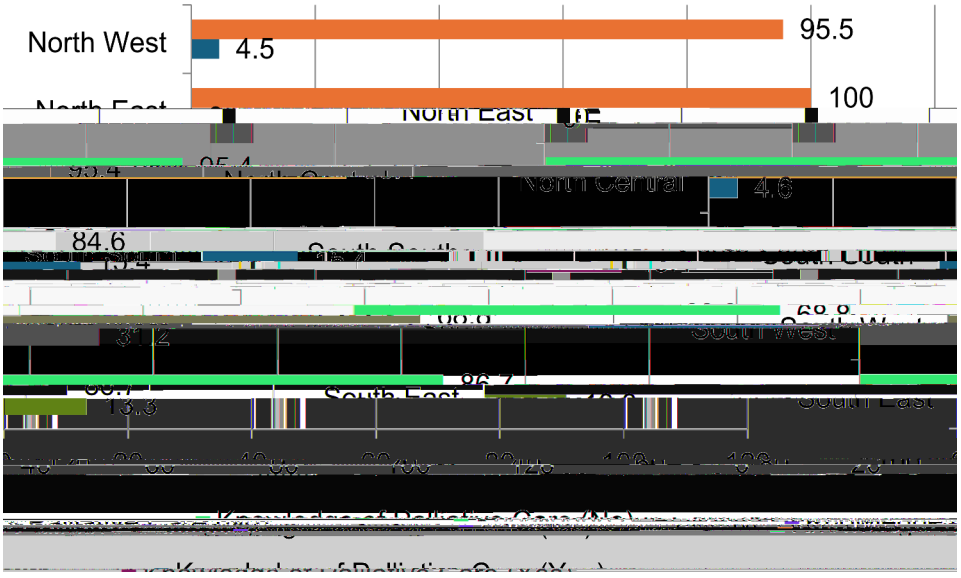

Fig. 1 Knowledge of palliative care across the six regions in Nigeria

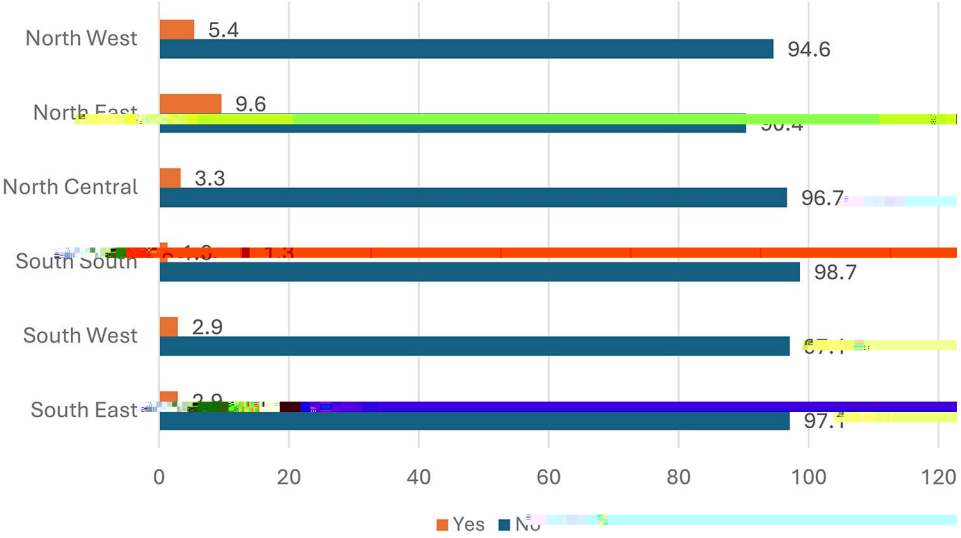

Fig. 2 Awareness of Palliative Care services in NISA-MIRCs facilities across the six regions in Nigeria

22% of those earning above $76.65 (N100,000) having knowledge compared with 1% of those earning ≤$19.16 (N25,000). On the other hand, the geopolitical zone, age, and health decision autonomy variables did not show statistically significant associations with knowledge of palliative care, as indicated by the nonsignificant p values ($p > .05$). Specifically, the p-value for geopolitical zones is 0.052, suggesting that there are no significant regional di erences in palliative care knowledge. With p values of 0.113 and 0.086, respectively, the respondents' age and autonomy over health decisions do not exhibit any significant relationships. In summary, the findings revealed that socioeconomic variables play a crucial role in the knowledge of palliative care among the women included in the study.

Barriers and facilitators in uencing the integration of Palliative Care into routine HIV care in PHC

Willingness of participants to access PCs in PHCs

Figure 4 depicts the 'willingness' of respondents to access or use palliative care services provided by primary healthcare centers (PHCs) near them. e South South region has the highest inclination, with 88.5% of respondents expressing willingness, followed by the North Central region (68.8%). On the other hand, the South West region has a lower proportion (39.9%) reporting willingness. ese data indicate considerable regional di erences in palliative care acceptance and utilization.

Fig. 3 Attitudes toward Palliative Care across the six regions in Nigeria

Perceived high cost

Across all likely barriers within regions, some crucial distributions were observed. As shown in Fig. 5, a high cost of palliative care topped the list of possible barriers, with respondents in the North Central (82.7%), North West (71.8%) and South South (73.1%) zones indicating it as a concern. e South East and South West zones report similar proportions (approximately 57.8% and 59.4%, respectively), whereas the North East Zone indicates a lower, but still notable, concern at 55.0%.

Stigma

e respondents highlighted that stigma could influence access to palliative care, as those (69.8%) in the North West Zone mentioned it as a barrier. e North Central and North East Zones also reported stigma as a possible concern, at 64.2% and 60.0%, respectively. Moreover, the South West zone has the lowest value of 39.1%.

Negative attitudes of health workers

e issue of negative attitudes from healthcare workers is most pronounced in the South South Zone, with 76.9% of respondents identifying it as a barrier. e North Central and North West zones also have high proportions, at 64.2% each. e South East zone shows a slightly lower proportion at 51.6%, whereas the South West and North East zones report the lowest levels of negative attitudes, at 30.4% and 50.0%, respectively. is indicates regional variation in healthcare workers' attitudes toward palliative care patients, reflecting potential di erences in training, awareness, and cultural attitudes toward palliative care across zones.

Unavailability of trained health workers

Similarly, the majority of respondents in the South South (69.2%), North West (64.4%) and North Central (63.1%) zones highlighted the unavailability of trained healthcare sta as a likely barrier. However, few of those in South East Nigeria (43.8%) and South West Nigeria (29.0%) perceived the unavailability of trained healthcare sta as a problem. e large distance between health facilities and homes emerged as a likely barrier for a moderate proportion of respondents in the North Central (51.9%) and North West (43.6%) zones. However, fewer respondents identified the same barrier in South West Nigeria (23.3%) and South East Nigeria (32.0%).

Table 2 Predictors of knowledge of Palliative Care

Variable	Categories	Knowledge (%)	No Knowledge (%)	Chi-Square *p*-value
Geo-political zone	South East	11 (9)	117 (91)	0.052 ^{NS}
	South West	22 (16)	116 (84)	
	South South	5 (10)	47 (90)	
	North Central	26 (10)	234 (90)	
	North East	6 (30)	14 (70)	
	North West	24 (12)	178 (88)	
Age of Respondents	18–24	2 (5)	40 (95)	0.113 ^{NS}
	25–34	26 (13)	175 (87)	
	35–44	42 (14)	256 (86)	
	45–54	22 (11)	170 (89)	
	55–64	2 (3)	56 (97)	
	65 and above	0 (0)	9 (100)	
Education	NFE (No Formal Education)	2 (2)	119 (98)	0.000*
	FSLC	5 (5)	106 (95)	
	JSCE/SSCE	20 (9)	214 (91)	
	OND/Diploma	22 (14)	141 (86)	
	HND/DEGREE	38 (26)	109 (74)	
	Post graduate	7 (30)	16 (70)	
Occupation	Housewife	4 (3)	126 (97)	0.000*
	Farmer	4 (4)	93 (96)	
	Trader	31 (12)	231 (88)	
	Teacher	13 (19)	54 (81)	
	Civil servant	32 (23)	110 (77)	
	Other	10 (10)	88 (90)	
Religion	Christian	68 (13)	467 (87)	0.023*
	Muslim	25 (10)	237 (90)	
	African traditional religion	0 (0)	2 (100)	
	Other	1 (100)	0 (0)	
Number of children	0–5 children	90 (13)	610 (87)	0.010*
	6 + children	4 (4)	96 (96)	
Place of Residence	Rural	14 (5)	258 (95)	0.000*
	Urban	80 (15)	446 (85)	
Type of Residence	Duplex	8 (53)	7 (47)	0.000*
	Bungalow	25 (26)	72 (74)	
	3/2 Bedroom Flat	39 (14)	235 (86)	
	Self Con	10 (8)	112 (92)	
	Living space with external facility	12 (4)	279 (96)	
Monthly Personal Income in Nigerian Naira (USD)	Less than or equal to 25,000 (≤ 19.16)	2 (1)	183 (99)	0.000*
	25,001–50,000 (19.16–38.32)	9 (7)	120 (93)	
	50,001–75,000 (38.32–57.48)	25 (16)	133 (84)	
	75,001-100,000 (57.48–76.64)	22 (13)	146 (87)	
	Above 100,000 (> 76.65)	35 (22)	123 (78)	
Health decision autonomy	Myself	49 (13)	321 (87)	0.086 ^{NS}
	Husband	18 (10)	170 (90)	
	Friends/Relative	3 (4)	67 (96)	
	Both of us	24 (15)	141 (85)	
Stage of disease	Stage 1	73 (11)	590 (89)	0.134^{NS}
	Stage 2	19 (14)	114 (86)	
	Stage 3	1 (50)	1(50)	

Note NS: Not significant; *Significant at the 0.05 level

Fig. 4 Willingness to access or utilize palliative care in nearby PHC

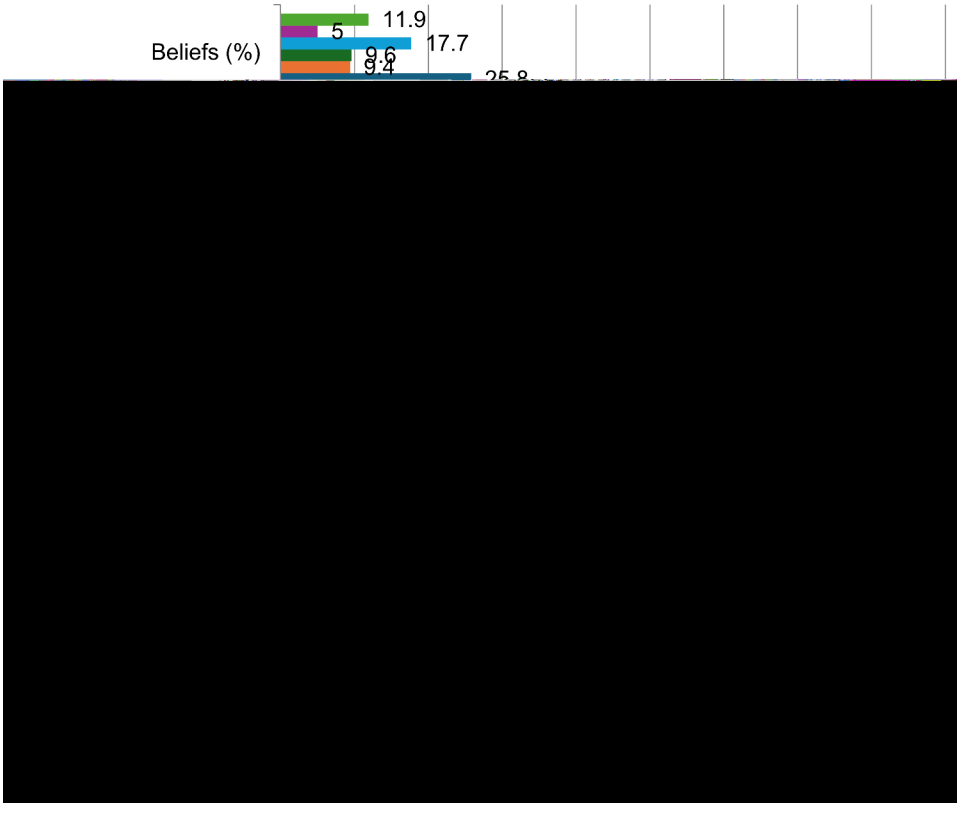

Fig. 5 Distribution of selected barriers to Palliative Care across geopolitical zones

Decision autonomy

Decision autonomy has lower proportions across all zones, indicating that it is less of a barrier than other factors. e South South and South West zones have the lowest percentages, at 7.7% and 13.8%, respectively. In contrast, non-recommendation from doctors is a substantial barrier in the North East (70.0%) and North West (50.5%) zones, indicating possible gaps in physician advocacy for palliative care. Finally, personal opinions concerning palliative care are a less prevalent obstacle overall, with South East Nigeria reporting the largest share (25.8%), followed by North Central Nigeria (17.7%).

is implies that while beliefs influence palliative care uptake, other systemic constraints, such as cost, stigma, and personnel availability, are more important across geographical zones.

Facilitators of integrating Palliative Care

Low cost of Palliative Care services

Figure 6 presents the distribution of facilitators of palliative care across six geopolitical zones in Nigeria. As shown in the figure below, a great majority of respondents in North East China (90.0%), South South Nigeria (88.5%), North Central Nigeria (85.8%), and North West Nigeria (80.7%) highlighted low-cost or no-cost palliative care as a likely facilitator of integration.

Positive attitudes of healthcare workers

Another facilitator mentioned by most of the respondents in North East Nigeria (80.0%), South South Nigeria (76.9%), North Central Nigeria (74.2%) and North West Nigeria (67.8%) was positive attitudes of health workers. However, fewer than half of the respondents in South West Nigeria identified the positive attitudes of health workers as facilitators.

Recommendation by physicians and the subjective other

Physician recommendations were regarded as critical facilitators, with South South Nigeria (88.5%), North East Nigeria (85.0%), North Central Nigeria (74.6%), South East Nigeria (73.4%), and other zones having the highest proportions. Palliative care is perceived as necessary for well-being in the North East (80.0%), North Central (80.0%), North West (68.8%), and South South (55.8%) zones, indicating strong recognition of its importance, whereas the South West (38.4%) and South East (46.9%) zones report lower proportions. Recommendations by subjective others are highest in the North East (45.0%) and North Central (34.2%) zones, indicating strong community support, whereas the South West (10.1%) and South East (14.8%) zones indicate lower approval rates.

e perception that palliative care lessens the burden on family caregivers was identified as a facilitator in the North East (65.0%) and North Central (63.1%) zones. Comparatively, South West Nigeria (15.2%) and South East Nigeria (27.3%) presented smaller proportions, suggesting a need for increased awareness of this benefit. Finally, belonging to a support group, which can enhance the support system for palliative care patients, was the most common facilitator in the South East (21.1%) and North Central (16.9%) zones. South West Nigeria (4.3%) and South South Nigeria (1.9%) reported the lowest proportions.

Discussion

is study explored the integration of palliative care into routine HIV care among women living with HIV (WLWH) in Nigeria, highlighting significant regional

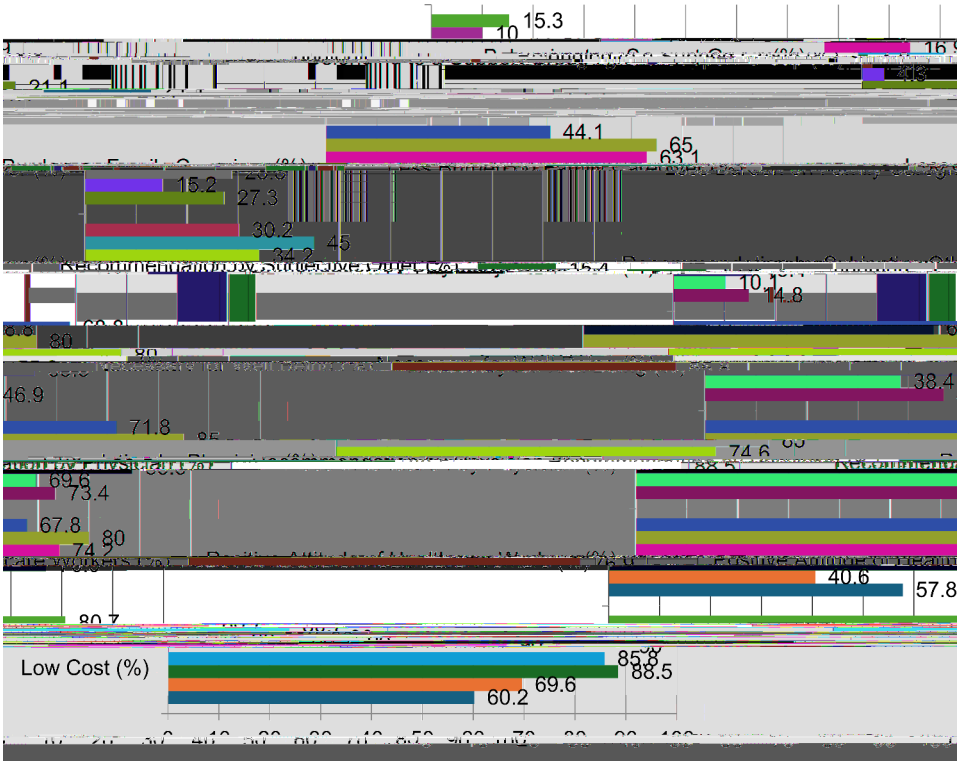

Fig. 6 Facilitators of integration of Palliative Care

disparities in knowledge, barriers, and facilitators. Over 90% of respondents lacked awareness of palliative care, though most recognized its potential to improve quality of life. e predictors of palliative care knowledge included higher education, occupation, urban residence, religion, fewer children, and higher income. Knowledge was highest in the South West (31.2%) and virtually nonexistent in the NorthEast (0%). Barriers to integration included high costs, stigma, negative healthcare worker attitudes, and the unavailability of trained sta . Facilitators involved low-cost services, positive healthcare worker attitudes, and physician recommendations.

e findings of this study align with those of previous research [36–39], which also highlighted substantial knowledge gaps regarding palliative care among patients, healthcare workers, and the public. Similar barriers, such as stigma, perceived high costs, and negative attitudes from healthcare workers, have been documented in other studies [45–48]. Additionally, facilitators such as positive attitudes of healthcare workers and physician recommendations are consistent with the literature on palliative care integration [47, 48]. However, the regional disparities identified in this study, particularly the stark di erences between the Northeast and Southwest regions, underscore the uneven distribution of healthcare resources and awareness across Nigeria [59].

is study yielded more detailed information than similar studies due to its comprehensive and region-specific focus [59–61]. By examining six geopolitical zones in Nigeria, it provided a nuanced understanding of regional disparities in knowledge, barriers, and facilitators. e use of a large and diverse sample size of HIV-positive women allowed for more robust conclusions and generalizability [62–64]. Additionally, the study's use of the EPIS framework [55, 56] enabled an in-depth exploration of factors influencing palliative care integration at various stages, o ering insights that were both detailed and context-specific, particularly in resource-limited settings.

One of the key strengths of this study is its comprehensive approach, involving a large, diverse sample size from Nigeria's six geopolitical regions [60]. e focus on WLWH in a resource-constrained setting like Nigeria provides valuable insights into specific challenges and facilitators for integrating palliative care into HIV care. e use of the EPIS framework allowed for a more detailed exploration of integration phases compared to other studies. Additionally, the patient-centered approach enriched the understanding of factors influencing palliative care uptake in resource-limited settings.

Despite its strengths, the study's reliance on self-reported data introduces the potential for bias [65–68], as participants may not have accurately recalled or reported their experiences. e cross-sectional design limits the establishment of causal relationships between variables [69]. Furthermore, the focus on WLWH may restrict the generalizability of the findings to other populations or healthcare settings. ese limitations suggest the need for more longitudinal studies to track changes in palliative care awareness and integration over time.

e findings have significant implications for policy, clinical practice, and research. To reduce regional disparities in palliative care for WLWH in Nigeria, targeted awareness campaigns should be prioritized, particularly in northern regions where knowledge gaps are most severe. Financial support through subsidies or low-cost services is crucial to overcoming economic barriers in high-cost regions. Nationwide healthcare worker training is essential to improve attitudes and care delivery, particularly in areas with negative perceptions of palliative care. Strengthening rural healthcare infrastructure and utilizing telemedicine can extend services to remote areas. Integrating palliative care into primary healthcare policies will ensure consistent access across all regions, while engaging religious and community leaders can help reduce stigma and encourage service uptake. Finally, a monitoring framework should be established to evaluate and adapt strategies for e ective regional implementation, ultimately improving the accessibility and quality of palliative care nationwide.

Conclusion

Our study identified significant gaps in knowledge about palliative care among a diverse population of WLWH and highlighted the value of brief educational exposure. Tailored context-specific interventions focused on improving knowledge and attitudes would be a critical step in e orts to develop coordinated multistakeholder palliative care services, especially in settings without palliative care specialists.

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Author contributions
NIA, TCO, and EEE conceptualized the study. NIA and JOJ contributed to the study design. NIA, IAO, and UJO led data collection. JOJ, JOO, and IAO analyzed the data. NIA, JOJ and IAO wrote the rst draft of the manuscript. EEE, JOO, TCO and UJO contributed to the manuscript revision. All authors read and approved the nal manuscript.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent participate
Ethical approval for this research was obtained from the Nigerian National Health Research Committee (NHREC/01/01/2007-18/03/2024). Informed consent was obtained from the participants before the commencement of quantitative data collection.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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