Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): September 2026 Issue
https://doi.org/10.51168/v3rad865
Original Article

Quality Of Integrated Care For Older People In Health Facilities In Kindu City, Maniema Province, Democratic Republic Of The Congo : A Cross-Sectional Study.

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Abstract

Introduction: Integrated care for older people is a major public health issue because it requires coordinated, continuous, and person-centred interventions. Its quality depends, in particular, on healthcare providers' competencies, service organization, and the availability of resources.

Objective: To describe the quality of integrated care for older people in health facilities in Kindu.

Methods: A cross-sectional, descriptive, and analytical observational study was conducted among 423 healthcare providers working in the selected health facilities in the Kindu and Alunguli health zones. Data were collected using a structured questionnaire. Descriptive analysis was used to present respondents' characteristics, while bivariate analysis examined associations between selected professional characteristics and the quality level of integrated care. The statistical significance threshold was set at 5%.

Results: Of the 423 respondents, 61.0% demonstrated a high level of integrated care quality, whereas 39.0% demonstrated an inadequate level. Statistically significant associations were observed with age ($p < 0.001$), sex ($p < 0.001$), educational level ($p < 0.001$), training in gerontology ($p = 0.002$), and professional category ($p = 0.024$). Length of professional experience was not significantly associated with care quality ($p = 0.663$).

Conclusion: The findings highlight the need to strengthen gerontology training, follow-up procedures, interprofessional coordination, and the resources required to provide care. The RACINE de TUKALUP model offers a proposed organizational framework for gradual implementation and evaluation.

Keywords: Older people; integrated care; quality of care; gerontology; health facility; Kindu; Democratic Republic of the Congo.

Submitted: July 01, 2026 **Accepted:** August 11, 2026 **Published:** September 30, 2026

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Introduction

Population ageing is transforming healthcare needs and requires health systems to adapt their services to address multimorbidity, loss of autonomy, and psychosocial vulnerability. Ageing is not, in itself, a disease; however, it may be accompanied by an accumulation of needs that require a comprehensive, individualized, and continuous response. The World Health Organization (WHO, 2015) emphasizes that the health of older people should be assessed in terms of their functional abilities, their environment, and their ability to maintain their autonomy. From this perspective, integrated care seeks to move beyond a system organized exclusively around diseases and instead consider the individual in all their dimensions. It involves assessing clinical and functional needs, preventing complications, monitoring chronic diseases, providing rehabilitation and psychosocial support, and, when necessary, delivering palliative care. WHO (2017) specifically recommends appropriate community-level

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interventions to prevent or manage declines in the intrinsic capacity of older people.

The *Integrated Care for Older People* (ICOPE) approach reinforces this orientation by proposing person-centred assessment, individualized care pathways, and coordination among care providers (WHO, 2019a). Its implementation framework also emphasizes service organization, the allocation of responsibilities, and the integration of interventions into primary healthcare systems (WHO, 2019b). The second edition of the ICOPE guidance reiterates the importance of adapting care pathways to the needs, preferences, and capacities of older people (WHO, 2025). Scientific literature shows that integrated approaches rely on several complementary components. The review by Briggs et al. (2018) highlights the importance of multidimensional assessment, service coordination, follow-up, and person-centred decision-making. Threapleton et al. (2017) emphasize that the implementation of these approaches also depends on organizational factors, particularly collaboration among healthcare professionals, information systems, and coordination mechanisms.

In sub-Saharan African countries, the organization of care for older people must take into account available human resources, service coverage, financial protection, and national policies. The review by Saka et al. (2019) highlights issues relating to health policies and older people's access to services in this region. Integrating palliative care into primary healthcare is also important, as it helps address pain, distressing symptoms, and the supportive care needs of patients and their families (WHO, 2018).

In the Democratic Republic of the Congo, care for older people must be considered in the context of the capacity of health facilities, resource availability, and the need for coordination between services. In Kindu, Maniema Province, improving the quality of care provided to older people requires a better understanding of healthcare providers' profiles and the characteristics associated with their practices. The presence of professionals from different categories is not, in itself, sufficient to guarantee integrated care; their competencies, working tools, follow-up procedures, and working conditions must also be considered.

This study therefore examines the quality of integrated care for older people in health facilities in Kindu. It is based on two specific objectives: to describe the sociodemographic and cultural characteristics of respondents and to assess the quality of integrated care for older people by examining the associations between care quality and selected characteristics of healthcare providers.

Methodology

Study Setting and Design

This study was conducted from **May to August 2024** in public and private health facilities located in the Kindu and Alunguli Health Zones, in Kindu City, Maniema Province, Democratic Republic of the Congo. The study covered **14 health facilities** selected from the health facilities included in the sampling frame. The study employed an observational, descriptive and analytical cross-sectional design. It aimed to describe integrated care practices for older people and examine their associations with healthcare providers' sociodemographic and professional characteristics, as well as institutional and organizational factors. The cross-sectional design allowed these dimensions to be assessed during a defined period without experimental intervention. However, it does not establish causal relationships. The study reporting was guided by the STROBE recommendations for observational studies (von Elm et al., 2007).

Study Population, Sampling, and Participants

Sample Size

:For our study, the sample size was determined using the following Fisher's formula:$n = \frac{Z^2.P.Q}{d^2}$: Where: **N** = Sample size; **Z** = Confidence coefficient at the 95% confidence level (α = 0.05), corresponding to 1.96; **p** = Expected proportion in the target population; **d** = Acceptable margin of error (precision), set at 0.05 (5%).

Study Population, Sampling and Sample Size Determination

The target population consisted of healthcare professionals working in public and private health facilities in Kindu. Since the total number of healthcare professionals working in the city was not known, the sample size was determined using Fisher's formula for estimating a proportion in a population of unknown size ; The final sample size was consequently set at **423 healthcare professionals**. This increase was intended to provide an adequate margin for potential losses during data collection and to preserve the required sample size for statistical analysis. The 14 health

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facilities were selected by simple random drawing. The name of each facility in the sampling frame was written on a separate slip of paper, placed in an urn, mixed, and drawn at random until 14 facilities had been selected. Eligible participants were healthcare professionals actively working in the selected facilities, involved in the delivery, organization or continuity of healthcare services, and who provided free and informed consent. Only questionnaires meeting the predefined completeness and data-quality criteria were retained for analysis.

Variables and Data Collection

The dependent variable was integrated care for older people. Its assessment was based on the dimensions covered by the data collection instrument : comprehensive assessment of needs; consideration of chronic diseases and comorbidities; management of pain and other symptoms; attention to functional autonomy and psychosocial needs; prevention; health education; patient referral; and continuity and coordination of care. The explanatory variables included the sociodemographic and professional characteristics of healthcare providers, particularly age, sex, professional category, educational level, and length of service, as well as their experience in caring for older people, participation in continuing professional development, and institutional and organizational factors. These factors included the availability of staff, medicines, and equipment; the existence of care procedures; workload; and referral and counter-referral mechanisms.

Data were collected using a structured questionnaire administered to the healthcare professionals concerned. A pre-survey conducted in a neighbouring health zone was used to assess the comprehensibility and feasibility of the instrument, after which adjustments were made to some questions. During the main survey, the research objectives were explained to participants, and responses were collected using a standardized procedure. Questionnaires were checked for completeness and consistency. The information collected covered respondents' characteristics, their professional knowledge and practices, and the material and organizational conditions under which care was provided.

Data Processing and Analysis

The analysis comprised descriptive and analytical components. The descriptive component aimed to present participants' characteristics and describe care practices and the operating conditions of the health facilities. The analytical component sought to examine associations between healthcare providers' characteristics, organizational factors, and indicators of integrated care.

For categorical variables, Pearson's chi-square test was planned when its assumptions were satisfied. Fisher's exact test could be used when expected cell counts were insufficient. Depending on the nature and distribution of the variables, multivariable analyses could be considered to examine adjusted associations. The statistical significance threshold was set at 5%, with interpretation taking into account measures of association and, where available, their 95% confidence intervals. The findings were to be interpreted in light of the cross-sectional nature of the study and the limitations associated with information reported by participants.

Ethical Considerations

The protocol received approval from the Ethics Committee of the School of Public Health at the University of Kinshasa under reference **ESP/CE/37/2024**. Access to the health facilities was facilitated by a research authorization letter issued by the University of the Martyrs of the Congo. Participants were informed about the objectives and procedures of the study. Participation was voluntary, and consent was sought before data collection. The confidentiality of responses and the protection of respondents' identities were maintained throughout data collection, processing, and presentation. Participants retained the right to refuse to answer any question or to decline participation in the study without adverse consequences.

Methodological Perspective

The data collected were intended to characterize care practices and the factors associated with integrated care for older people in the health facilities studied. They also provide an empirical basis for informing the proposed **RACINE de TUKALUP model**, particularly with regard to strengthening professional competencies, formalizing care procedures, improving interprofessional coordination, and monitoring the quality of care. The relevance of the model should be assessed in light of the study findings, while its effectiveness will require a subsequent, appropriately designed evaluation.

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RESULTS

Sociodemographic and Professional Characteristics of Respondents

The study included 423 healthcare providers. The 31–40-year age group was the most represented (41.6%), followed by the 41–50-year age group (33.8%). Men accounted for 61.5% of respondents, while women represented 38.5%. More than half of the participants were married (52.2%). Regarding educational attainment, 56.0% had a graduate or bachelor's degree, and 20.8% held a master's degree. Nursing was the most represented field of initial training (44.9%), followed by medicine (21.3%). Most respondents reported having received no training in gerontology (68.8%) or palliative care (73.0%).

Table 1. Sociodemographic and Professional Characteristics of Respondents (N = 423)

Variables	Categories	Frequency	%
Age	20–30 years	63	14.9
	31–40 years	176	41.6
	41–50 years	143	33.8
	51–60 years	39	9.2
	61 years and older	2	0.5
Sex	Female	163	38.5
	Male	260	61.5
Marital status	Single	168	39.7
	Married	221	52.2
	Divorced	20	4.7
	Widowed	7	1.7
	Other/not specified	7	1.7
Educational level	State diploma/equivalent	66	15.6
	Graduate/bachelor's degree	237	56.0
	Master's degree	88	20.8
	Doctorate	15	3.5
	Other	17	4.0
Initial training	Nursing sciences	190	44.9
	Medicine	90	21.3
	Pharmacy	42	9.9
	Public health	21	5.0
	Physiotherapy/rehabilitation	20	4.7
	Nutrition	18	4.3
	Psychology	16	3.8
	Other	26	6.1
Training in gerontology	Yes	132	31.2
	No	291	68.8
Training in palliative care	Yes	114	27.0
	No	309	73.0

Source: Survey conducted among healthcare providers in the selected health facilities in Kindu.

The results also indicate that 56.0% of respondents were nurses, 19.6% were physicians, and 8.5% were pharmacists. Furthermore, 51.3% worked in public health facilities. Most respondents had between 6 and 10 years of professional experience (34.5%), while 80.1% reported having provided

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care to older people during the previous three months. However, 46.3% indicated that they only sometimes had sufficient time for each patient

3.2. Level of Care Quality and Associated Factors

Among the 423 respondents, 258 (61.0%) demonstrated a high level of integrated care quality, while 165 (39.0%) demonstrated an inadequate level. Bivariate analysis revealed statistically significant associations between care quality and five factors: age, sex, educational level, training in gerontology, and professional category. Length of professional experience was not significantly associated with care quality.

Table 2. Summary of Bivariate Associations Between Healthcare Providers' Characteristics and the Quality of Integrated Care

Factor studied	Pearson's χ^2	df	p-value	Statistical conclusion
Age group	21.972	3	< 0.001	Significant association
Sex	16.004	1	< 0.001	Significant association
Educational level	39.752	4	< 0.001	Significant association
Training in gerontology	9.437	1	0.002	Significant association
Length of professional experience	1.585	3	0.663	No significant association
Professional category	14.597	6	0.024	Significant association

Note: χ^2 = Pearson's chi-square statistic; df = degrees of freedom. The statistical significance threshold was set at 5%.

The proportion of respondents demonstrating high-quality care increased across the age groups presented in the bivariate analysis, rising from 47.2% among those aged 22–29 years to 76.6% among those aged 50–60 years. The proportion was 72.1% among women and 52.5% among men. By educational level, high-quality care was reported for 36.3% of holders of a state diploma, 60.7% of those with a graduate or bachelor's degree, 77.0% of master's degree holders, and 81.2% of doctorate holders. High-quality care was observed among 73.3% of healthcare providers who had received gerontology training, compared with 56.4% of those who had not received such training. In contrast, the proportions of high-quality care varied relatively little across categories of professional experience, consistent with the absence of a statistically significant association for this factor.

DISCUSSION

Respondents' Profile and Training Needs

The study shows that the healthcare providers were predominantly male, that the 31–40-year age group was the most represented, and that nursing sciences constituted the main field of initial training. These characteristics describe the professional profile of those involved in providing care for older people in Kindu.

A particularly important finding concerns the low proportion of healthcare providers who had received training in gerontology or palliative care. This situation may limit their proficiency in certain dimensions of integrated care, particularly functional assessment, prevention of loss of autonomy, pain management, and communication with older people and their families. The ICOPE recommendations specifically emphasize the need to strengthen healthcare professionals' capacity to identify needs related to intrinsic capacity and organize individualized interventions (WHO, 2019a).

This approach is consistent with the findings of Briggs et al. (2018), who argue that integrated care approaches rely on coordinated interventions and multidimensional assessment.

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Overall Quality of Integrated Care

The finding that 61.0% of respondents were classified as providing high-quality integrated care indicates that beneficial practices exist in the health facilities studied. However, the proportion of 39.0% classified as providing inadequate-quality care demonstrates that further improvement is needed.

The quality of integrated care cannot be reduced to the delivery of medical procedures alone. It also involves prevention, continuity of care, referral, consideration of patients' preferences, and coordination among healthcare professionals. The review by Briggs et al. (2018) identifies several common components of integrated care approaches, including coordination, follow-up, and comprehensive consideration of patients' needs. Similarly, Threapleton et al. (2017) emphasize that implementing integrated care depends on the ability of services to share responsibilities and organize coherent care pathways.

The findings from Kindu therefore call for an examination not only of individual competencies but also of service organization and the conditions under which healthcare professionals work. WHO (2019b) emphasizes that care integration requires organizational mechanisms capable of linking assessment, planning, intervention, and follow-

Association Between Age and Care Quality

Healthcare providers' age was significantly associated with the quality level of integrated care ($p < 0.001$). The proportions of high-quality care were higher in the older age groups. This finding may be consistent with accumulated professional experience, greater familiarity with clinical situations, and a better understanding of patients' needs. However, this association does not mean that age necessarily leads to improved care. Experience, educational attainment, professional responsibilities, and working conditions may jointly contribute to the observed differences.

Furthermore, chronological age alone is not a measure of professional competence. WHO (2015) emphasizes the need to adapt services to people's needs and the importance of healthcare systems capable of supporting high-quality practices.

Respondents' Sex and Quality of Care

A statistically significant association was observed between sex and the quality of integrated care ($p < 0.001$). According to the results, the proportion of high-quality care was 72.1% among women and 52.5% among men. This finding describes a difference between the groups studied but does not establish the mechanisms underlying it. However, this difference should not be attributed to an inherent characteristic associated with sex without evidence supporting such an explanation. The person-centred approach recommended by WHO (2019a) requires care practices to be assessed in terms of patients' needs, the quality of interactions, and continuity of interventions..

Educational Level and Quality of Care

Educational level was significantly associated with the quality of integrated care ($p < 0.001$). The proportion of high-quality care was higher among respondents holding master's and doctoral degrees than among those holding a state diploma. This variation suggests that theoretical knowledge, analytical abilities, and competencies developed during formal education may influence professional practices. Nevertheless, it would be excessive to conclude that academic qualifications alone guarantee better care. Quality also depends on practical experience, available protocols, resources, and service organization. Threapleton et al. (2017) emphasize that barriers to care integration may be organizational as well as professional.

Gerontology Training and Integrated Care

Training in gerontology was significantly associated with the quality of integrated care ($p = 0.002$). High-quality care was observed among 73.3% of trained healthcare providers, compared with 56.4% of those who had not received such training. This finding supports the importance of expanding access to specialized training. Gerontology training can help improve needs identification, complication prevention, recognition of frailty, and patient referral. It may also promote better communication with older people and their relatives. The ICOPE approach recommends that healthcare professionals be able to identify declines in intrinsic capacity and propose interventions tailored to individual needs (WHO, 2017, 2019a). Palliative care is a complementary component of this approach. It is not limited to the final days of life; rather, it aims to prevent and relieve

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suffering associated with serious illnesses while addressing patients' physical, psychological, social, and spiritual needs. WHO (2018) recommends integrating palliative care into primary healthcare to facilitate access to symptom relief and support for patients and their families.

Length of Professional Experience and Professional Category

Length of professional experience was not significantly associated with the quality level of integrated care ($p = 0.663$). This finding indicates that, when categorized, years of professional practice did not significantly distinguish care quality levels in the analysis presented. Experience remains important, but it does not automatically translate into integrated practices when it is not supported by up-to-date training, appropriate procedures, and adequate resources. By contrast, professional category was significantly associated with care quality ($p = 0.024$). The proportions of high-quality care varied across professional categories, which may reflect differences in responsibilities, training, and exposure to the needs of older people.

Integrated care requires complementary contributions from physicians, nurses, pharmacists, physiotherapists, nutritionists, psychologists, and other relevant professionals. WHO (2019b) emphasizes the importance of coordination among stakeholders and the structuring of care pathways. Coordination helps reduce fragmented interventions and ensure greater continuity of care.

Implications for Health Facilities in Kindu

The substantial proportion of respondents reporting that they only sometimes had sufficient time for each patient also highlights the importance of working conditions and service organization. WHO (2021) emphasizes the need for indicators to monitor the development of palliative care and guide public health decisions. More broadly, regular quality measurement makes it possible to identify shortcomings, monitor progress, and target resources. The RACINE de TUKALUP model offers a proposed framework for organizing improvement efforts around six pillars: public responsibility and governance; accessibility and financial protection; coordination and continuity of care; integration of care centred on older people; development of competencies and research; and a supportive environment and family support. This model can serve as a framework for structuring interventions, but its effectiveness must be assessed through phased implementation, predefined indicators, and a comparison of outcomes before and after the interventions.

Study Limitations

The cross-sectional nature of the study does not make it possible to establish the temporal sequence of the associations or draw conclusions about causal relationships. Questionnaire-based data may also be influenced by the way respondents report their practices. Differences between health facilities, available resources, and working conditions should be considered when interpreting the findings. Finally, the generalization of the results to facilities that were not included in the study should be undertaken cautiously. Despite these limitations, the study provides useful evidence for describing healthcare providers and identifying factors associated with the quality of integrated care in the selected health facilities in Kindu. It contributes to identifying priorities for action that are adapted to the local context.

CONCLUSION

This study described healthcare providers' characteristics and assessed the quality of integrated care for older people in health facilities in Kindu. Among the 423 respondents, 61.0% demonstrated a high level of care quality, whereas 39.0% demonstrated an inadequate level. These findings indicate that beneficial practices are present while highlighting the need to strengthen several dimensions of healthcare organization. Bivariate analysis revealed statistically significant associations between care quality and age, sex, educational level, training in gerontology, and professional category. Length of professional experience was not significantly associated with care quality. The RACINE de TUKALUP model offers a proposed framework for structuring interventions around governance, financial protection, continuity of care, clinical integration, competency development, and family and social support.

RECOMMENDATIONS

To health authorities:

- Strengthen the human, material, and pharmaceutical resources required to provide care for older people.

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- Support the development and dissemination of protocols tailored to comprehensive assessment, prevention, and palliative care.
- Establish regular monitoring of quality indicators.

To managers of health facilities:

- Organize continuing professional development and supportive supervision in gerontology and palliative care.
- Formalize referral, follow-up, and information-transfer procedures.
- Strengthen interdisciplinary meetings and clarify the roles of the different healthcare professionals.

To healthcare providers:

- Strengthen their competencies in comprehensive assessment, prevention, pain management, and psychosocial support.
- Encourage older people to participate in decisions concerning their care.
- Ensure more systematic documentation of follow-up and referrals.

To universities and training institutions:

1. Develop training modules tailored to the integrated care of older people.
2. Support research evaluating the effects of training and organizational interventions on the quality of care.

To families and communities:

1. Promote family and social support, health information, and appropriate use of healthcare services.
2. Participate in supporting older people while respecting their dignity, preferences, and autonomy.

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Authors' Contributions

Tunda Kasongo Lukali Prosper: Contributed to the literature review, development of the theoretical framework, structuring of the article, and drafting of its general presentation.

Senker Ndimba Bob: Contributed to the methodological design, organization of field data collection, processing and analysis of the results, and their scientific interpretation.

Kafinga Luzolo Emery, Ndjonka Dieudonné, Masandi Milondo Alphonse, and Hamuli Mastaki Benjamin: Provided scientific supervision and methodological guidance, critically reviewed the manuscript, and contributed to improving its final version.

Conflicts Of Interest

The authors declare that they have no conflicts of interest related to the conduct of this study, data analysis, or publication of the findings.

Funding

This research received no external funding. It was conducted without a specific grant from any public, private, or nonprofit organization.

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List Of Acronyms, Initialisms, And Abbreviations

Acronym, initialism, or abbreviation	Meaning
DRC	Democratic Republic of the Congo
WHO	World Health Organization
ICOPE	Integrated Care for Older People
STROBE	Strengthening the Reporting of Observational Studies in Epidemiology
CIOMS	Council for International Organizations of Medical Sciences
OECD	Organisation for Economic Co-operation and Development
RACINE de TUKALUP	Proposed conceptual model for improving integrated care for older people; TUKALUP corresponds to the name of its creator, Tunda Kasongo Lukali Prosper
R	Responsibility, regulation, and governance
A	Accessibility and financial protection
C	Coordination and continuity of care
I	Integration of care centred on older people
N	Competency development, training, and research
E	Supportive environment and family and social support
OR	Odds ratio
aOR	Adjusted odds ratio
CI	Confidence interval
p	Probability value used in statistical tests
χ^2	Chi-square statistic used to test associations between variables
ESP/CE/37/2026	Reference number of the ethics approval or authorization cited in the manuscript; to be verified before publication

Acknowledgements

Sincere appreciation is extended to all individuals and institutions that contributed, directly or indirectly, to the successful completion of this study. Special thanks are extended to the health authorities, heads of health facilities, and healthcare professionals in Kindu City for their availability, cooperation, and participation in the data collection process. Gratitude is also expressed to the academic institutions and ethics committees for their guidance and support throughout the research process, as well as to all those who provided scientific, technical, or moral support during the conduct of this study.

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Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): September 2026 Issue
https://doi.org/10.51168/v3rad865
Original Article

Publisher Details:

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa