



Graduate-level nursing education, practice, and research in Uganda: current challenges and opportunities for advanced practice nurses (APN). A review of literature, policy document and professional guidelines

Godfrey Katende^{a,*}, John Baptist Asimwe^a, Grace Among^a, Grace Nambozi^b, Mercy Muwema^{a,c}, Christine Nimwesigwa^c

^a Aga Khan University, School of Nursing and Midwifery, Kenya

^b Mbarara University of Science and Technology, Department of Nursing, Uganda

^c Uganda Nurses and Midwives Council, Uganda

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ABSTRACT

Objective: This paper examined the status of graduate-level nursing education, practice, and research in Uganda and identified associated challenges and opportunities.

Materials and methods: An analysis of existing literature, policy documents, and professional guidelines was conducted. This approach was selected to highlight contextual and systemic opportunities and challenges for graduate-level nursing in Uganda.

Results: Among the graduate-level programs offered in Uganda, identifying as whether it is an NP or CNS pose a challenge. Key challenges include uneven program distribution, faculty shortages, limited research infrastructure. High attrition and low completion rates (~38% in Africa) were due to financial and personal challenges. Opportunities include a growing pool of baccalaureate-prepared nurses, increasing numbers of doctorly prepared faculty, blended learning technologies, donor support, and policy frameworks supporting advanced practice nursing (APN) development.

Conclusion: There is a lack of CNS or NP classification that will be needed for regulatory clarity or faculty development. Strengthening APN education and standardizing curricula could improve healthcare delivery and research output among nurses in Uganda. Strategic investment in education, faculty development, and research capacity is critical for advancing nursing nationally and regionally. Higher Education Institutions (HEIs) should undertake graduates tracer studies of existing programs to determine employment outcomes in relation to the scope of practice.

1. Introduction

Globally, graduate nursing education, research, and practice are critical to advancing the nursing profession. Evidence indicates that advanced practice nurses (APNs) enhance healthcare effectiveness and quality (Wheeler et al., 2022). The World Health Organization (WHO) promotes integrating graduate-level nursing roles to strengthen health systems and societal health outcomes (Ahmat et al., 2022). Uganda has introduced graduate-level nursing education; however, the quality of APN graduates and their contributions to healthcare remain unclear.

The International Council of Nurses (2020) defines an APN as a registered nurse with expert knowledge, complex decision-making

skills, and the clinical competencies required for expanded practice. Entry into APN roles requires a master's degree (Schober et al., 2020). APN roles are shaped by context and may include education, leadership, evidence-based practice, and research (Christmals & Armstrong, 2019).

Two major APN roles exist: nurse practitioner (NP) and clinical nurse specialist (CNS). NPs provide an expanded clinical scope including diagnosis, prescribing, and ordering tests. CNSs offer specialist care, education, quality improvement, and other non-clinical functions (International Council of Nurses, 2020). Countries determine APN legislation, regulation, and education based on healthcare system needs (Wheeler et al., 2022). APNs often work in educational institutions, hospitals, research organizations, and communities (Ahmat et al., 2022;

* Corresponding author.

E-mail address: godfrey.katende@aku.edu (G. Katende).

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International Council of Nurses, 2020).

Critical shortages of graduate health professionals are evident in Africa, including Uganda (Itambo et al., 2024; National Department of Health, 2020). In Uganda, the nurse-to-population ratio is approximately 1:11,000 (National Department of Health, 2020). Limited APN availability affects progress toward universal health coverage (UHC) and Sustainable Development Goals (SDGs). APN role development responds to population growth, disease burden, technological changes, and workforce shortages (Christmals & Armstrong, 2019). However, global efforts to secure sufficient graduate-level nurses remain insufficient (International Council of Nurses, 2020). While many East and Southern African countries train generalist nurses, APN-level training capacity is limited, leading to low APN numbers (Asamani et al., 2022; Itambo et al., 2024). Inconsistent program nomenclature also complicates CNS/NP role recognition (Christmals & Armstrong, 2019). In Uganda, there is a lack of a Doctor of Nursing Practice (DNP) that is practice focused. Mbarara University of Science and Technology (MUST) offers a PhD in nursing which is housed in faculties of medicine (Nakanjako et al., 2014). To examine the status of graduate nursing education, practice, and research in Uganda and to highlight the associated challenges and opportunities. This paper critically examines and synthesizes existing literature, policy documents, and professional guidelines related to graduate-level nursing education, APN roles, and research in Uganda and Sub-Saharan Africa.

2. Methods

This paper employed a narrative (integrative) literature review approach to critically examine and synthesize existing empirical research, policy documents, professional guidelines, and grey literature on graduate-level nursing education, advanced practice nursing (APN) roles, and research in Uganda and the broader Sub-Saharan African (SSA) context. A narrative review was selected because it allows for a flexible, interpretive synthesis that integrates diverse sources, including quantitative and policy-oriented materials. Also, this process helped to explore not only factual data but also the contextual, socio-political, economic, and systemic factors influencing the development and implementation of graduate nursing programs in resource-constrained settings (Sukhera, 2022).

2.1. Search strategy

Literature was identified through systematic searches of electronic databases including PubMed/MEDLINE, CINAHL, Google Scholar, Scopus, and African Journals Online (AJOL). Grey literature and policy documents were sourced from websites of key organizations such as the World Health Organization (WHO), International Council of Nurses (ICN), Uganda Nurses and Midwives Council (UNMC), Uganda Ministry of Health, and relevant university repositories. Additional sources were identified through hand-searching reference lists of key articles and consultation with Ugandan nursing academics and stakeholders. The searches were conducted using combinations of the following keywords and Medical Subject Headings (MeSH): “advanced practice nursing,” “APN,” “nurse practitioner,” “clinical nurse specialist,” “graduate nursing education,” “master’s nursing,” “doctoral nursing,” “nursing research,” “Uganda,” “Sub-Saharan Africa,” combined with terms such as “challenges,” “opportunities,” “barriers,” “policy,” “regulation,” and “practice.” No strict date limits were applied, but priority was given to literature from 2010 onward to capture contemporary developments following the expansion of graduate nursing programs in Uganda.

2.2. Inclusion and exclusion criteria

Documents were included if they: (a) addressed graduate-level nursing education, APN roles (e.g., CNS or NP), practice, or research in Uganda or SSA; (b) were published in English; (c) were peer-reviewed

articles, policy/guideline documents, reports, or theses/dissertations; and (d) provided insights into challenges, opportunities, status, or contextual factors. Exclusion criteria included studies focused solely on undergraduate nursing, non-nursing health professions (unless they offered comparative insights), or those lacking relevance to education, practice, or research outcomes.

2.3. Screening and selection

Titles and abstracts were screened for relevance, followed by full-text review of potentially eligible sources. Discrepancies in selection were resolved through discussion between authors. Approximately 47 sources were initially identified, with 21 meeting inclusion criteria after screening.

2.4. Data extraction and synthesis

Data were extracted using an agreed upon standardized matrix that captured sources, status, sub-theme and the key findings related to education, practice, research, challenges, opportunities, and contextual factors. Thematic analysis approach guided the synthesis, and interpretation of the findings by the team while identifying patterns, gaps, inconsistencies (e.g., nomenclature issues), and actionable opportunities.

2.5. Quality and rigor

We employed the Scale for Assessment of Narrative Review Articles (SANRA) to appraise the sources used. We made sure that the resources met all the six (6) rating criteria as per SANRA (Baethge et al., 2019) and understood the phenomenon. Potential selection bias and narrative subjectivity was limited through transparent reporting double checked among the authors.

3. Results

The results are summarized using the sources, category, sub-themes and findings about Graduate-Level Nursing Education, Practice, and Research in Uganda and Sub-Saharan Africa (Table 1).

3.1. Status of graduate-level nursing education, practice, and research in Uganda

As of 2022, Uganda had five accredited CNS programs (Asamani et al., 2022). Currently, there are eight programs: pediatrics, critical care, women's health, mental health nursing, community midwifery and reproductive health, community nursing, nursing leadership and administration, and nursing education (National Council for Higher Education [NCHE], 2026; Uganda Nurses and Midwives Council, 2022). These programs are offered by four universities: Mbarara University of Science and Technology, Makerere University, Lira University, and Uganda Christian University. While the programs are being implemented, they are unevenly distributed relative to Uganda's population (~45 million) and rural-urban distribution. The available programs do not specify whether they are CNS or NP focused. The few nurses in Uganda with APN qualifications obtained them abroad. Inconsistent nomenclature and faculty shortages limit APN availability (Christmals & Armstrong, 2019; Mbalinda et al., 2017).

Uganda lacks doctoral programs such as a Doctor of Nursing Practice (DNP) that is practice focused. Mbarara University of Science and Technology (MUST) offers a PhD in nursing which is housed in faculties of medicine, health sciences, or public health rather than in nursing department. Some nurses have pursued PhDs through sandwich programs in collaboration with international institutions (Mbalinda et al., 2017; Nakanjako et al., 2014). Sandwich programs have also been instrumental in the development of the nursing profession in Uganda.

Table 1

Summary of Graduate-Level Nursing Education, Practice, and Research in Uganda and Sub-Saharan Africa.

Sources	Category	Sub-themes	Key findings
Asamani et al. (2022)	Status	Graduate Programs	8 accredited CNS-focused master's programs (Pediatrics, Critical Care, Women's Health, Mental Health, Community Midwifery & Reproductive Health, Community Nursing, Nursing Leadership & Administration, Nursing Education) offered by 4 universities (Mbarara University of Science and Technology (MUST), Makerere, Lira, Uganda Christian University)
Asamani et al. (2022)	Status	Distribution & Scope	Uneven distribution relative to population (~45 million) and rural-urban divide.
Christmals and Armstrong (2019)	Status	Distribution & Scope	Programs lack clear CNS vs NP distinction. Few locally trained APNs; most qualified abroad.
Nakanjako et al. (2014)	Status	Doctoral Education	No DNP programs. Limited PhD in Nursing (e.g., at MUST); most embedded in medicine/public health faculties.
Mbalinda et al. (2017)	Status	Doctoral Education	Sandwich programs with international partners common.
Uganda Nurses and Midwives Council (2022)	Status	Regulation & Practice	Uganda Nurses and Midwives Council (2022) outlines APN roles, but significant implementation gaps.
MoPS (2017)	Status	Regulation & Practice	Most graduate nurses in managerial roles.
Ministry of Health (2020)	Status	Regulation & Practice	Limited clinical mentors.
Obuku et al., (2018)	Status	Research Capacity	Limited grant-writing skills, absence of national nursing research agenda, few publication outlets.
Christmals and Armstrong (2019)	Challenges	Program Entry	High tuition fees, older student age, low enrollment, inadequate orientation, limited policy support.
Itambo et al. (2024)	Challenges	Program Entry	limited policy support, few bridging courses, lack of context-specific curricula.
Molassiotis et al. (2020)	Challenges	During Study	Faculty shortages, work-life-study conflicts, limited clinical practice time in work-study models.
Christmals and Armstrong (2019)	Challenges	During Study	Faculty shortages, work-life-study conflicts, limited clinical practice time in work-study models.
Hayward & Ncayiyana (2015)	Challenges	Program Exit	High attrition (~38% in Africa), financial/personal barriers, low completion rates.
Desmennu and Owoaje (2018)	Challenges	Research	Limited faculty, poor infrastructure, inadequate supervision
Molassiotis et al. (2020)	Challenge	Research	Funding shortages, weak quality assurance.
Christmals and Armstrong (2019)	Challenges	Practice	Limited APN numbers, resistance from other cadres
Uganda Nurses and Midwives	Challenges	Practice	Poor dissemination of scope-of-practice guidelines

Table 1 (continued)

Sources	Category	Sub-themes	Key findings
Council (2022); Wheeler et al. (2022)	Challenges	Practice	Inadequate curricula contextualization, shortage of clinical preceptors.
Mbalinda et al. (2017)	Opportunities	Education	Growing undergraduate pool for postgraduate study; blended learning; interprofessional collaboration
Kabarungi et al. (2023)	Opportunities	Education	Blended learning; interprofessional collaboration; need for more doctorally prepared educators
Christmals and Armstrong (2019)	Opportunities	Education	prepared educators; incorporate contemporary content (genomics, informatics, climate change, health economics).
Uganda Nurses and Midwives Council (2022); Wheeler et al. (2022)	Opportunities	Practice	Develop and disseminate clear scope-of-practice policies
Itambo et al. (2024)	Opportunities	Practice	Full stakeholder engagement; harmonized regional frameworks.
Wakida et al. (2021)	Opportunities	Research	Full stakeholder engagement; harmonized regional frameworks.
Japheth et al., (2023)	Opportunities	Research	Improving university research infrastructure; collaborative grants & seed funding
Obuku et al., (2018)	Opportunities	Research	Flipped supervision models & technology-enhanced mentoring.
Christmals and Armstrong (2019)	Opportunities	Broader Systemic	Development of locally relevant nursing research agenda; flipped supervision models
Ahmat et al. (2022)	Opportunities	Broader systemic	Donor support, policy advocacy,
Tusiimire et al. (2024)	Opportunities	Broader Systemic	Policy advocacy, career pathways, contribution to UHC and SDGs

There is a disconnect between university graduates and licensure/practice. The Uganda Nurses and Midwives Council (Uganda Nurses and Midwives Council, 2022) outlines APN roles, but implementation gaps remain significant. Government support favors diploma- and certificate-level nurses, and few qualified clinical mentors exist for master's-level students, affecting APN program success (Uganda Nurses and Midwives Council, 2022).

Research capacity is limited due to inadequate grant-writing skills, lack of a local nursing research agenda, and limited publication outlets (Obuku et al., 2018). Postgraduate nurses have few professional development opportunities for specialized practice. Most graduate nurses occupy managerial roles, reducing clinical workforce capacity (Ministry of Health, 2020; MoPS, 2017).

3.2. Challenges for graduate-level nursing education, research, and practice

Graduate nursing programs face challenges at program entry, during study, and at exit (Christmals & Armstrong, 2019; Itambo et al., 2024). These challenges contribute to low uptake of graduate programs, affecting research and clinical practice outcomes.

3.2.1. Program entry challenges

High tuition, older student age, low enrollment, inadequate orientation, limited policy support, few bridging courses, and lack of context-specific curricula for APNs in Sub-Saharan Africa further complicate program development (Christmals & Armstrong, 2019; Itambo et al., 2024). These factors make it difficult to increase the number of nurses who upgrade to higher levels.

3.2.2. Study duration challenges

Limited time for knowledge transfer, faculty shortages, and work-life-study conflicts impede learning (Christmals & Armstrong, 2019; Molassiotis et al., 2020). Most programs are work-study models with time constraints that limit coverage of content and clinical specialization practice.

3.2.3. Program exit challenges

High attrition and low completion rates (~38% in Africa) are due to financial and personal challenges (Hayward & Ncayiyana, 2015), exacerbating the situation. This attrition is also felt in Uganda graduate nursing education environment especially because financing studies remains a major hindrance to completion (Mbalinda et al., 2017).

3.3. Research challenges

Institutional challenges such as limited faculty, infrastructure development, and inadequate supervision guidelines have significantly affected the implementation of the research agenda. Supervisor-related challenges (research capacity and quality assurance) and student-related challenges (funding, time, and support) reduce research output and graduation success (Desmennu & Owoaje, 2018; Molassiotis et al., 2020).

3.4. Practice challenges

Limited graduate nurse numbers and faculty absorption in teaching roles challenge Uganda's health care system. Would-be clinical preceptors are not employed in mainstream health settings, decreasing availability of clinical mentors. Resistance from lower-cadre clinicians and inadequate dissemination of scope-of-practice guidelines persist. Inadequate curricula contextualization also affects practice (Christmals & Armstrong, 2019; Uganda Nurses and Midwives Council, 2022; Wheeler et al., 2022).

4. Opportunities for graduate nursing education, practice, and research

The transition to university-level training for graduate programs promotes interprofessional collaboration, which can improve health professional relationships and translate into better health services and quality outcomes. Increasing the number of doctorally prepared (DNP and PhD-qualified) nurse educators is an enabler for APN preparation and implementation (Christmals & Armstrong, 2019; Mbalinda et al., 2017). The growing number of undergraduate graduates creates a pool for postgraduate study and builds career pathways for specialty programs that produce nurses for faculty, leadership, clinical, and research roles (Mbalinda et al., 2017).

Technological advances such as blended learning support postgraduate education in nursing (Kaburungi et al., 2023). Donor support for higher education should be increased to facilitate advanced nursing program development (Mbalinda et al., 2017; Tusiimire et al., 2023). Advanced graduate programs should incorporate contemporary content (health economics, genomics, informatics, climate change) and maintain standards through continuous monitoring and evaluation (Christmals & Armstrong, 2019).

4.1. Opportunities for practice

Nursing practice must be guided by well-documented and disseminated policy documents and scope-of-practice frameworks (MoPS, 2017; Uganda Nurses and Midwives Council, 2022; Wheeler et al., 2022). Successful advanced nursing programs require full stakeholder engagement in initiation and development because nurses work collaboratively (Christmals & Armstrong, 2019; Itambo et al., 2024; Tibaijuka et al., 2024). Stakeholder feedback is important for improving nursing practice.

4.2. Opportunities for research

Ugandan universities are improving research structures (laboratories, offices, grants) (Wakida et al., 2021), but collaborative grants and seed funding are still needed to build a strong research culture and increase outputs. Locally relevant nursing research agendas must be developed as the essential component for advancing the profession. Effective research supervision and financial support improve graduate research skills and program completion (Japheth et al., 2023; Desmennu & Owoaje, 2018). Flipped supervision models leveraging technology enhance student-faculty interaction and mentoring.

5. Conclusion

Graduate-level nursing programs in Uganda continue to face significant challenges in education, research, and practice. High attrition and low completion rates (~38% in Africa) are due to financial and personal challenges. There is a lack of CNS or NP classification that will be needed for regulatory clarity or faculty development. This clarity of the APN roles is critical for achieving the SDGs and UHC, improve patient outcomes, and advancing healthcare delivery in Uganda and the region (Christmals & Armstrong, 2019; Itambo et al., 2024; Wheeler et al., 2022). Opportunities such as enhanced scope-of-practice policies, donor support, and the growing number of graduate-qualified nurses exist and need to be explored. Nurse leaders must adopt innovative strategies, engage stakeholders, and capitalize on existing opportunities to strengthen graduate nursing programs regionally. The development of graduate-level nursing education in Uganda has broader implications for Ugandan nurses in transforming health systems. Future research is needed to explore institutions' intrinsic factors that inhibit APN program development. Additionally, Higher Education Institutions (HEIs) should undertake graduates tracer studies of existing programs to determine employment outcomes in relation to the scope of practice.

6. Relevance to clinical practice

The advancement of graduate-level nursing education and APN roles in Uganda has broader implications for nurses across Sub-Saharan Africa (SSA). First, APN program development enhances the professionalization of nursing, enabling nurses to take on expanded clinical, leadership, and research roles (Christmals & Armstrong, 2019; Itambo et al., 2024).

Second, strengthening APN education can mitigate workforce shortages by equipping nurses with advanced skills to provide primary and specialized care, supporting achievement of UHC and the SDGs (Ahmat et al., 2022; Wheeler et al., 2022). Graduate-level nurses are positioned to lead quality improvement initiatives, implement evidence-based practice, and serve as educators and mentors, fostering capacity building across the region (Christmals & Armstrong, 2019). This can also encourage governments to increase health care budget allocations.

Third, standardized curricula and regulatory frameworks across SSA countries are essential to ensure recognition of APN roles, improve mobility of highly trained nurses, and reduce brain drain while enhancing quality of care (Itambo et al., 2024; Wheeler et al., 2022). Harmonization can facilitate cross-country collaboration in research and clinical practice. Finally, expanding graduate-level nursing

opportunities empowers nurses to influence health policy, advocate for patient-centered care, and participate in national and regional health planning. These advances underscore the strategic role of nurses in transforming health systems and addressing complex health challenges in SSA countries.

6.1. Limitations

First, the absence of a systematic search protocol increases the risk of selection and interpretation bias. Second, the review may not have captured all relevant literature, as exhaustive database searches. Consequently, the findings should be interpreted with caution and viewed as a foundation for further systematic investigation rather than definitive evidence.

What this paper adds • Provides evidence on the available graduate-level nursing programs in Uganda • Offers direction for future nursing programs • Presents the support needed for graduate nurses to conduct research.

Statements for studies in Humans/animals

This study did not involve humans nor animals.

CRediT authorship contribution statement

Godfrey Katende: Writing – review & editing, Writing – original draft, Conceptualization. **John Baptist Asimwe:** Writing – review & editing, Writing – original draft, Conceptualization. **Grace Among:** Writing – review & editing, Writing – original draft. **Mercy Muwema:** Writing – review & editing, Writing – original draft. **Christine Nimwesigwa:** Writing – review & editing.

Declaration of competing interest

All authors declare no competing interest related to this manuscript.

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