EAHRC
EAST AFRICAN HEALTH RESEARCH COMMISSION
Research for Health and Prosperity

ORIGINAL ARTICLE

Nurse Prescribing Practices: An International Systematic Review with Implications for Tanzania

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ABSTRACT

Background: The role of nurse prescribing is increasingly expanding worldwide as the nursing profession evolves. Several factors have driven its introduction into healthcare systems, including improving community health, increasing patients' access to medicines, optimizing nurses' knowledge and skills, enhancing healthcare accessibility, increasing nurses' autonomy, and reducing physicians' workload.

Objectives: This review aims to discuss nurses' roles in prescribing medicines from an international perspective and within the Tanzanian context, including current practices, opportunities, strategies, and challenges.

Methods: Four electronic databases, including CINAHL, PubMed/Medline, Cochrane Library, and PsycINFO, were searched to identify peer-reviewed articles published in English between January 2015 and July 2025. Studies were selected using predefined inclusion criteria and appraised using the Mixed Methods Appraisal Tool (MMAT) version 2018.

Results: Fourteen publications out of 4,217 retrieved articles were included in this study. Findings indicate that nurses can prescribe medications depending on country legislation and educational qualifications. In some countries, nurse/midwife specialists prescribe medicines without additional training because prescribing education is incorporated into their curricula. In Tanzania, nurses' prescribing roles remain unclear, as legislation does not authorize nurses to prescribe independently without physician involvement. Furthermore, physician resistance and limited systems supporting continuity of non-physician prescribing and patient experience monitoring were identified as major challenges to implementing nurse prescribing.

Conclusion: Nurses' authority to prescribe medicines varies across countries, depending on legislation and healthcare systems. Many countries implementing nurse prescribing provides additional educational programs to support the role. Legal implementation of nurse prescribing in Tanzania may provide important healthcare benefits.

BACKGROUND

Nurse prescribing of medicines is increasing worldwide among both generalist and advanced practice nurses.[1] Traditionally, prescribing has been recognized as a physician's responsibility.[2] However, increasing social, economic, and political demands on healthcare systems have expanded this role to other healthcare professionals, including nurses. Nurse prescribing has therefore emerged in response to changing healthcare needs and increasing specialization among nurses and midwives as their scope of practice continues to expand.[3]

Nurse prescribing is now recognized in areas such as community care and mental health, where it has demonstrated effectiveness in improving care processes, communication, awareness, and patient satisfaction.[4] Expanding prescribing rights is also considered a positive step toward enhancing accountability and patient safety.[3] The nursing profession continues to evolve through advances in science, technology, and evidence-based practice to improve both individual and community health outcomes.[5] This evolution has progressed more rapidly in developed than in developing countries.[1]

Nurse prescribing refers to the official authority allowing nurses to prescribe specific medications.[6] However, legal, educational, and organizational conditions governing prescribing vary across countries. In countries where nurse prescribing is permitted, minimum qualification requirements are established to support safe practice.[7]

In Tanzania, nurses are categorized according to educational level. Certificate-level nursing programs last two years and award a nursing certificate. Ordinary and advanced diploma programs require three years of study under the National Council for Technical and Vocational Education and Training (NACTVET). Bachelor's nursing programs last four years and are regulated by the Tanzania Commission for Universities (TCU). Graduates from accredited institutions at certificate, diploma, and degree levels must pass the Tanzania Nurses and Midwifery Council (TNMC)

licensing examination before practicing independently.[8,9]

Following successful completion of the TNMC board examination, nurses at all levels are awarded registration certificates and practicing licenses that indicate their qualifications and areas of specialization. Master's and doctoral programmes are also available, typically requiring two or three years and four years of study, respectively, with possible extensions of one year for research purposes. Nurses with diploma level education and above are classified as Registered Nurses (RN), while those holding certificate qualifications are classified as Enrolled Nurses (EN). Nurses with master's degrees and higher qualifications are commonly referred to as Advanced Nurse Practitioners (ANP).[10]

According to the TNMC scope of practice, ANPs may prescribe medications.[6] However, the extent of this authority remains unclear because governing regulations do not explicitly define prescribing responsibilities or prescribing code numbers.

Nurse prescribers are categorized differently across countries, and prescribing authority varies considerably worldwide. In Europe, three of thirteen countries grant full prescribing rights to selected categories of nurses.[1,11] These include nurse prescribers, nurse specialists, and independent nurse prescribers who are legally authorized to prescribe medicines within their specialties.[1]

In the United States of America, ANPs include certified nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists, and certified nurse midwives.[12] Collectively, these are referred to as Advanced Practice Registered Nurses (APRNs), who possess autonomous prescribing authority within their specialty areas.[12,13] APRNs are responsible for patient management and accountable for health promotion, assessment, diagnosis, treatment, and prescription of both pharmacological and non-pharmacological interventions.[13]

Nurse prescribing currently exists across all six continents and is implemented through varying nursing roles based on national and regional practices. Prescribing may occur under Advanced Practice Nurse (APN), Advanced Level Nursing (ALN), or task-sharing roles depending on country-specific contexts.[14] These roles differ in levels of clinical decision-making, patient assessment, and disease management. Regulatory authorities establish qualification requirements according to national or regional jurisdictions.[14]

The introduction of highly trained nurse prescribers in Tanzania may improve healthcare quality and patient satisfaction. Evidence indicates that APNs provide care that is equivalent or, in some aspects, superior to that provided by other healthcare cadres.[15] However, nurse prescribing implementation often requires additional pathways beyond APN qualifications and may involve lower qualification requirements in some settings.[10]

In countries where registered nurse prescribing is permitted, prescribing generally occurs under conditions of high diagnostic certainty and within clearly defined areas of competence.[13] Prescriptive authority has become an effective example of healthcare role transformation.[16]

This review aims to examine current nurse prescribing practices, opportunities, strategies, and challenges associated with implementation. It also explores global driving forces, implementation strategies, and barriers to determine whether nurse prescribing may be applicable within the Tanzanian context. Therefore, this review addresses four key research questions: 1) What are the current nurses' legal rights to prescribe medicines worldwide compared to the Tanzanian context? 2) What factors necessitated the introduction of nurse prescribing practices in countries with legal prescribing rights? 3) What strategies are employed in countries where nurses have legal rights in medicine prescribing? 4) What challenges affect nurse prescribing within healthcare systems where nurses prescribe medicines?

METHODS

Design

The systematic review was conducted and reported following a modified version of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines proposed by Boers, Mayo-Wilson et al., and Stovold et al.[17]The protocol was pre-registered in the PROSPERO database under registration number CRD42023425618 and was last updated on 4th July 2025.

Search Methods

The databases used to identify relevant articles included CINAHL, PubMed/MEDLINE, the Cochrane Library, and PsycINFO. Additional search strategies, including expert consultation and reference checking, were also employed. Reference checking and hand-searching were conducted to minimize the possibility of missing relevant studies from the initial search strategy.

The search included articles published between January 2015 and July 2025 and was limited to studies published in English. Search terms were developed using keywords derived from the review topic. The search terms included: "nurse practice*," "nurse prescribing medication," "nurse prescribing medication strategies," "nurse prescribing medication challenges," "nurse prescribing practices internationally," and "nurse prescribing in Tanzania." These terms were applied consistently across all databases. The same search phrases were used electronically in each database to retrieve relevant published literature. Filters were applied to improve search efficiency and reduce irrelevant results. Time restrictions were used to limit studies to the most recent publications. In addition, only full-text and peer-reviewed articles were included. Search results were sorted according to relevance. Records were excluded at various stages if they did not meet the inclusion criteria based on title, abstract, or full-text screening. Some studies that met the inclusion criteria were excluded because they were systematic reviews or meta-analyses.

All search results were imported into Covidence software for management. Duplicate records were removed automatically, and three reviewers independently screened titles and abstracts using Covidence to identify potentially relevant studies. To minimize bias, all reviewers independently assessed the retrieved studies.

Inclusion and Exclusion Criteria

Only primary research studies with qualitative, quantitative, and mixed-methods designs were included in this review. Studies were eligible if they involved nurses working in healthcare facilities with medication prescribing responsibilities. Studies were excluded if they were shorter than four pages, as such papers were considered more likely to provide limited summaries without sufficient methodological detail or findings. Articles without full-text access (e.g., abstract-only publications), studies outside the specified publication period, and papers published outside peer-reviewed journals were also excluded.

Quality Appraisal For Included Studies

The quality of included studies was assessed using the Mixed Methods Appraisal Tool (MMAT), version 2018[18] (see Appendix A3). The tool consists of five questions specific to each study design category. Only original qualitative, quantitative, and mixed-method studies were included in this review. Each study was assessed using the relevant MMAT criteria. All reviewers independently applied the appraisal checklist to assess study quality. Responses were categorized as "Yes," "No," or "Can't tell," indicating that criteria were met, not met, or insufficient information was available, respectively.

Data Abstraction and Synthesis

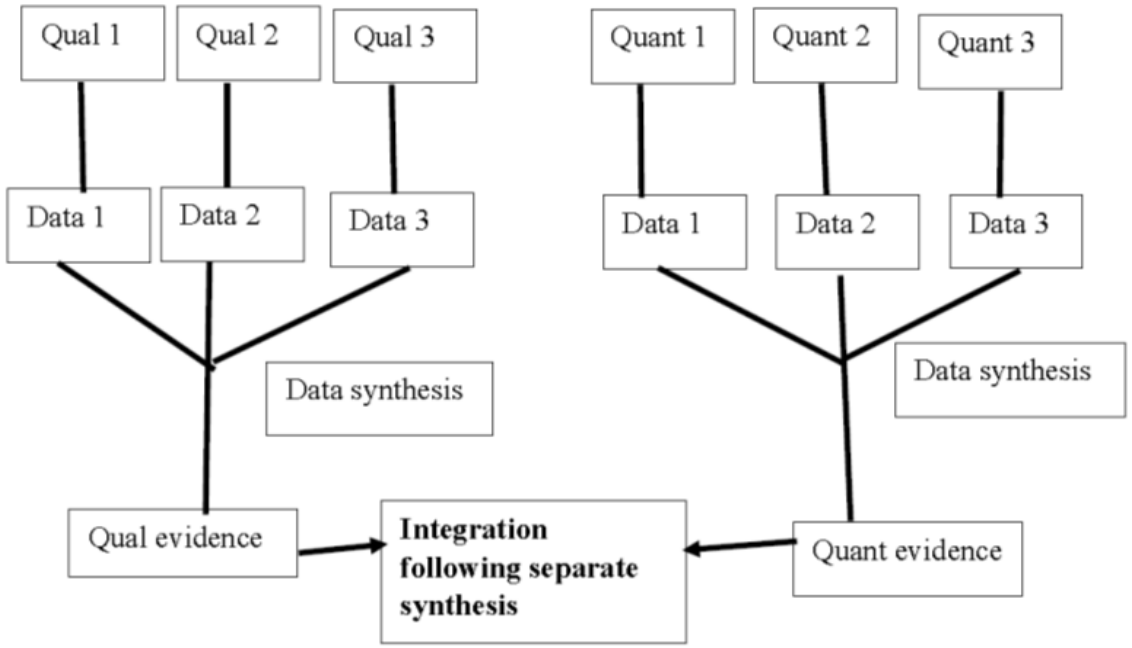
All authors participated in data extraction and analysis. Relevant data were systematically extracted from each included study using a predefined and piloted extraction form. Extracted information included study title, authors, publication year, study aim, study design, participant characteristics, setting, sample size, data collection methods, analytical approach, and key findings.

AAD and MKI independently performed data extraction, while DAM verified the accuracy and completeness of extracted information. Any discrepancies were resolved through discussion until consensus was reached. Extracted data were compiled and organized using Microsoft Excel to facilitate systematic comparison and synthesis across studies.

The review employed a Convergent Segregated Approach following the methodology described by Stern et al. in 2020.[19] This approach involved synthesizing quantitative and qualitative findings separately before integrating the evidence, as illustrated in Figure 1.

In this study, AAD initiated the analysis process and communicated each stage to MKI for additional input regarding selected studies to strengthen the rigour of the findings. DAM subsequently provided further review and input. Data extraction was conducted systematically and in stages to ensure valid findings for each study objective. Information regarding nurse prescribing practices in countries where nurses prescribe medication was extracted in as much detail as possible. Prescribing practices identified across studies were categorized as either fully authorized or partially authorized. Meta-analysis was not feasible because of substantial inconsistencies across the included studies.

FIGURE 1: Integrated Quantitative and Qualitative Data Evidence



Ethical Consideration

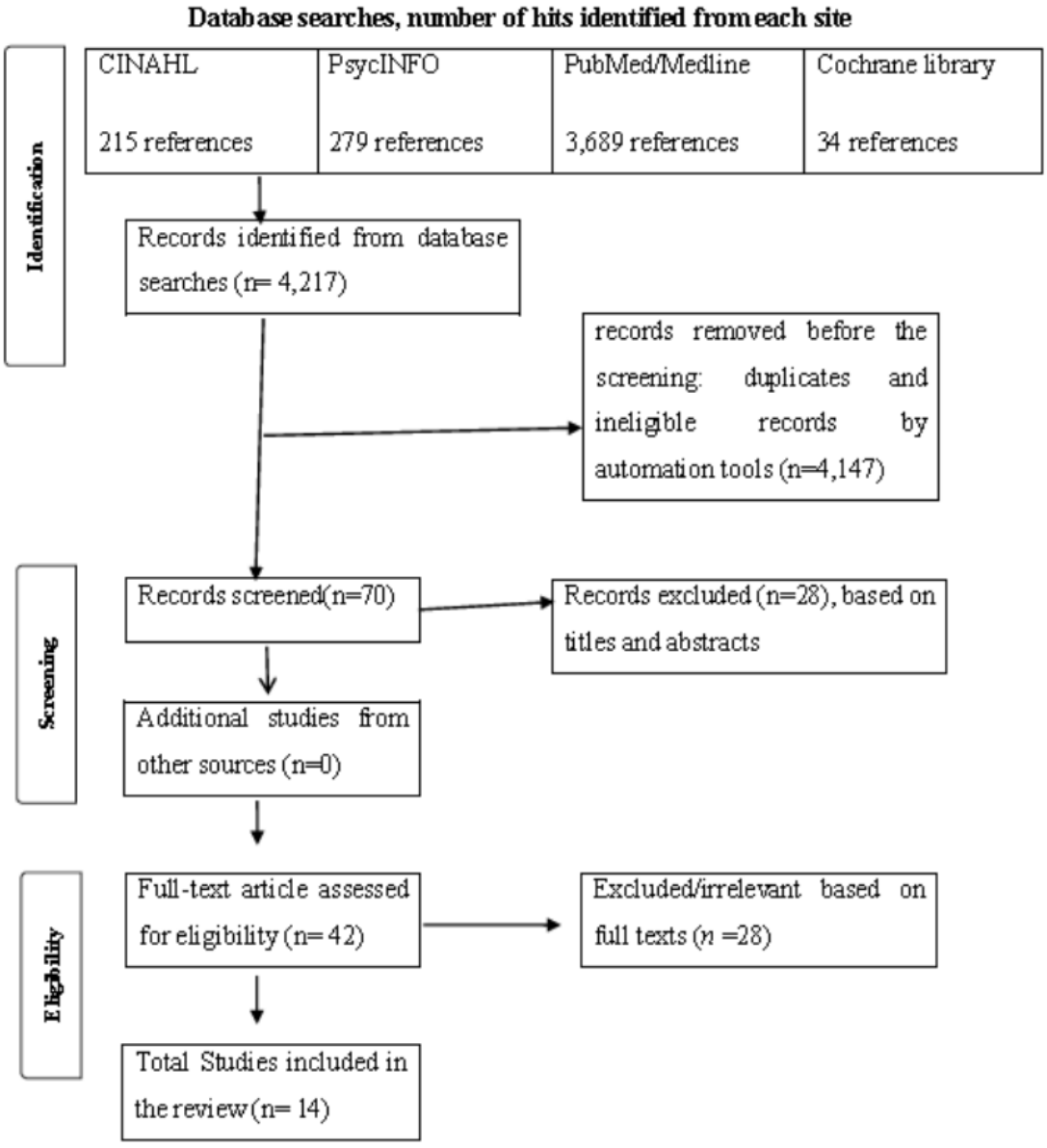
Ethical approval was not required as this study used only publicly available published literature and involved no primary data collection.

RESULTS

Search Results

The search identified 4,217 published papers related to nurse prescribing. After removing duplicates, 4,147 studies remained for screening. Titles, abstracts, and reference lists were reviewed, resulting in 70 papers selected for full-text assessment. No additional studies were identified from other sources. Of these, 28 articles were excluded after title and abstract screening, while another 28 were excluded based on the inclusion and exclusion criteria. Risk of bias assessment was performed for all included studies using the selected appraisal tool. The findings indicated variability in methodological quality across studies, with most studies demonstrating acceptable quality and a low to moderate risk of bias. Ultimately, 14 studies were included in the review, as illustrated in the PRISMA 2020 flow diagram Figure 2.

FIGURE 2: PRISMA 2020 Flow Diagram of Search Results and Study Selection



Individual Studies' Characteristics

This review included 14 peer-reviewed studies published between January 2015 and July 2025 from nine countries or regions. Of these, seven studies were quantitative,[20–26] five were qualitative,[1,27–30] and two used mixed-method approaches.[31,32] The findings highlighted both positive experiences and challenges related to nurse prescribing. Reported facilitators included professional collaboration, physician support, networking opportunities, clinical learning experiences, ongoing education, and successful implementation experiences. Several studies also demonstrated increased prescribing activities, positive expectations regarding patient care, and recognition of nurses' expanding roles in healthcare delivery.

Across the studies, commonly reported barriers included insufficient pharmacology training, unclear role descriptions, restrictive legal and policy frameworks, increased workload, lack of institutional support, physician dependence, and negative attitudes toward nurse prescribing. Concerns regarding nurses' preparedness, professional boundaries, and competency requirements were also identified. Overall, the findings illustrate varied experiences and perceptions regarding nurse prescribing implementation across different contexts and healthcare systems. A detailed summary of the included studies addressing the research questions is presented in Table 1.

Quality Appraisal Results

Quality appraisal of the included studies was conducted to assess methodological rigor and identify potential risk of bias. The methodological quality of the selected studies was evaluated using the Mixed Methods Appraisal Tool (MMAT), version 2018, according to the respective study designs. This appraisal process enabled assessment of the strengths and limitations of the included studies and ensured the inclusion of studies with acceptable methodological quality. The detailed quality appraisal results for each included study are presented in Table 2

Main findings/synthesis (The results per each objective from included studies)

The current nurses' prescribing, opportunities, strategies and legal rights internationally

Nurse prescribing has been part of nursing practice in several countries for decades. In Europe, by 2019, thirteen countries had enacted legislation supporting nurse prescribing, with prescribing rights ranging from broad authority within specialties to restricted medication lists[1]. By 2015, thirteen states and the District of Columbia in the United States had authorized nurse practitioners to prescribe controlled substances independently.[1]

In Canada, nurse prescribing has continued to evolve in response to emerging healthcare needs, particularly in primary care.[23] In Iran, healthcare policies support nurse prescribing across health-oriented institutions. One policymaker stated: *"…this practice has become legal in many countries. They started based on need, wisdom, and science, and they observed that they could save the patient's life because constant access to physicians is difficult, more expensive, and more costly. The situation in our country is the same"*.[30]

Nurses' Prescribing Opportunities: Necessitating Factors Towards Implementation

Several factors have driven nurse prescribing implementation globally. These include physician shortages, particularly in rural settings, physician workload, healthcare costs, increased nurses' autonomy, and expanding service coverage.[23] Nurse prescribing also improves access to medicines and contributes to healthcare cost-effectiveness while enhancing patient satisfaction.[30]

As nurse prescribing gains acceptance globally, physicians are increasingly showing positive attitudes toward the role. A study from China in 2025 found that physicians supported nurse prescribing because of its potential contribution to patient recovery.[26] In England, mental health nurses (MHN) have been prescribing within their specialties since 2006 and continue to expand prescribing roles through innovative clinical practices.[31]

Strategies Employed in Countries Adopting the Nurses' Legal Rights in Medicine Prescribing

Several factors influenced the introduction of nurse prescribing, including government policy, prescribing legislation, medication types, and healthcare contexts.[1] Countries such as Finland and Ireland[1] established separate educational pathways to support implementation,[27] whereas other countries integrated prescribing competencies directly into nursing curricula.

A study from New Zealand identified three implementation strategies: building trust among colleagues, emphasizing patient safety, and strengthening collaborative nurse–physician relationships.[33] In Spain, Estonia, and Denmark, nurses were required to hold at least a bachelor's degree and complete physician-supervised practice before independent prescribing.[1]

Additional strategies included expanding medication lists, promoting public awareness, strengthening professional recognition, offering continuous pharmacology training, and modifying medication plans into treatment plans.[29] In Iran, pilot implementation with selected nurses was proposed before full-scale authorization.[30] Continuing education, academic preparation, professional autonomy, and adaptation to new responsibilities were also identified as facilitators.[32]

Challenges Towards Nurse Prescribing in the Context of the Healthcare System

Several barriers have affected nurse prescribing implementation. In Iran, implementation progressed slowly because nurses were not initially granted full prescribing authority.[30] Physician resistance remains a significant challenge due to traditional professional hierarchies and concerns regarding authority and professional identity.[28] In Ireland, major barriers included increased workload, limited professional development opportunities, inadequate support, and restrictive prescribing regulations.[25] In Canada, implementation varied across provinces and did not consistently align with population needs.[23]

Studies from Spain identified internal barriers such as inadequate pharmacology training, dependence on physicians, lack of institutional support, and limited

prescribing authority.[29,32] External barriers included restrictive regulations, administrative complexity, and lack of confidence in nurses' prescribing competencies. One participant stated: *"We have a lot of problems with people who didn't start the process at the time... and that today still don't have the card for prescribing, and that generates a lot of frustration"*.[29]

In England, concerns were raised that MHNs may focus narrowly on specific conditions rather than broader patient wellbeing.[31] Studies in Finland identified unclear job descriptions, incomplete care plans, and uncertainty regarding physician consultation arrangements as barriers[27]. In China, both the public and healthcare professionals expressed concerns about nurse prescribing and competency requirements.[24] In Iran, legal ambiguities, inadequate training, weak institutional support, and negative organizational cultures also hindered implementation.[28]

Across countries where nurses prescribe medicines, implementation challenges showed substantial similarities. Table 3 summarizes selected countries and their minimum qualification requirements.

The Current Nurses' Prescribing and Legal Rights in Tanzania

Nurse prescribing in Tanzania remains at a preliminary stage. A survey conducted in Tanga, Mtwara, Singida, and Shinyanga regions showed that nurses prescribed medications and performed minor surgical procedures beyond their educational preparation.[21] The study recommended additional training, particularly in prescribing, to address shortages in healthcare providers.

TABLE 3: Countries' Minimum Qualifications for Nurse Prescribing

Country	year adopted the role	Minimum Qualifications of nurses who prescribe drugs	Regulation authority
Sweden	1994	RN (Bachelor from university or university college	Law
UK	1992	Independent prescribers (course on independent nurse prescribing required (NMC approved post-registration prescribing program. v200 or v300 Course (6 months course length))	Medicinal Products: Prescription by Nurses, Act 1992
Norway	2002	Public health nurse specialization (Bachelor, plus 60 ECTS)	Law
Ireland)	2007	Nurse prescriber: RN plus additional, approved educational program (range 20 to 40 ECTS for a nurse prescriber certificate or higher if the Master APN program	Pharmacy Act, Statutory Instrument No.201/2007 on Medicinal Products
Denmark	2009	RN (Bachelor, of which 30 ECTS "cluster" on medical treatment, including prescribing)	Order 1219 of 11/12/2009, delegation of reserved procedures
Finland	2010	RN (Bachelor, with postgraduate education in prescribing (45 ECTS)	Decree 1088/2010 on Prescriptions Nurse prescriber
Netherlands	2012	Nurse specialist (Master APN, 120 ECTS)	Decree, December 21/2011
Cyprus	2012	APN nurse (Master APN degree with specialization(s))	Nursing and Midwifery Law, Annex III, 2b) V
Poland	2015	Two-tiered: RN with (i) Master's and (ii) Bachelor's degree	Ordinance of 28/10/2015 on prescriptions issued by nurses and midwives
Spain	2015	RN (Bachelor with a minimum of one year of work experience, or additional training in prescribing if < 1-year experience)	Royal Decree 954/2015 of 23 October
Estonia	2016	Family nurse if working with a family physician with completed training of 120 hours (clinical pharmacology, approved by the Agency of Medicines)	Health Services Organisation Act 2016

Continue

TABLE 3: Continued

Country	year adopted the role	Minimum Qualifications of nurses who prescribe drugs	Regulation authority
France	2017	Nurse ("Medical auxillaires")	Act 2016-41 on the modernization of the health system
South Africa	2005	Not specified	Nursing Act, 33 of 2005
Namibia		Not specified	Nursing Act (8) 2004 in Namibia
Kenya	2020	Not specified	Public Health Act Cap 242 of the laws of Kenya
Switzerland	2017	Nurse specialist (Master's degree)	Article 124b of Public Health Act 800.01
Canada	1967	University bachelor degree	The College of Registered Nurses of Nova Scotia Regulations (Section 27, 2002), approved by the government

Key: ECTS: European Credit Transfer System, RN: Registered Nurse, APN: Advanced Practice Nurses, NMC: Nursing and Midwifery Council. (Data sources: (1,16,32,33))

TABLE 1: Characteristics of Individual Studies

Author, date & country	Title of the article	Study design	Methods of data collection	Objectives of the study	Key Results of the study
A1: Hopia, H., Karhunen, A., Heikkilä, J. (2017), Finland	Growth of nurse prescribing competence: facilitators & barriers during education	A descriptive, qualitative study	Interviews, observation & survey	To describe the barriers & facilitators of the growth of nurse prescribing competencies	-Barriers described were unclear job description, incomplete care plans & concerns about how consultation time would be organized -The facilitators of the practice were found to be the learning clinical examination and networking with
A2: Claudia B. Maier (2019), Ireland	Nurse prescribing of medicines in 13 European countries	Cross-sectional national survey	On-line survey	1. To identify which countries in Europe have adopted laws on nurse prescribing and its setbacks. 2. To explore barriers to prescribing practices	1. In Europe, as of 2019, a total of 13 countries had adopted laws on nurse] prescribing. All countries had regulatory and minimum educational requirements in place to ensure patient safety; the majority required some form of physician oversight 2. The significant challenges towards the practice were increased workloads, lack of continuous professional development, lack of support & overly restrictive rules and policies governing prescribing.
A3: Anecita Gigi Lim, Nicola North & John Shaw (2017), New Zealand.	Navigating professional & prescribing boundaries: Implementing nurse prescribing in New Zealand	Qualitative approach	Semi-structured interview	To describe the Strategies employed in establishing the role and negotiating the associated professional boundaries	Three strategies were discussed: first, is to build trust in prescribing practices among their colleagues, second, to employ the discourse of patient safety, which is circumscribed by the scope of practice & third, to confirm the professional relationship of nurses and physicians as collaborative, but with the crucial difference of it being interdependent, not dependent
A4: Neil Kelly (2018), England	Mental health nurse non-medical prescribing: current practices, future possibilities.	Mixed method	Cross-sectional survey of data	To describe the barriers to role implementation & its long-term solution	Nurse Specialist considers a specific problem rather than the whole person & their medical conditions. The solution can be ensuring the prescribing MHN understands the physical health of patients, supported by the completion of a health assessment module at an advanced level and a thorough knowledge of the pharmacology of their prescribing regimes.
A5: Marycelina Msuya, Jane Blood-Siegfried, Juliet Chugulu, Paulo Kidayi, John Sumaye, Rogathe Machange, Christina Chuki Mtuya, Katherine Pereira, 2017 -Tanzania	Descriptive study of nursing scope of practice in rural medically underserved areas of Africa, South of the Sahara	Explorative study	Interviewer-administered questionnaires	To describe the scope of "non-nursing duties" carried out by nurses	The study found that Nurses at all levels of education, with or without additional training, were prescribing for patients and performing minor surgical procedures, well beyond their educational preparation
A6: Silvia Esteban-Sepúlveda, Sara Fernandez-Canto, M. Carmen Gallego-Cortes, Sara Salguero-Grau,	Nurse prescription start-up in a Spanish health organization: Nurses' prepare-dness & 6-month	descriptive study	Online administered Questionnaire	To describe nurses' knowledge and expectations of nurse prescribing in a health institution & to report the nurses' prescriptions	Training needs (overall score = 4.2/5) & lack of knowledge of the law (4.25/5) were scored lower by nurses with postgraduate training. Subjective assessment of preparedness among nurses was high (>4/5), & the highest-

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TABLE 1: Continued

Author, date & country	Title of the article	Study design	Methods of data collection	Objectives of the study	Key Results of the study
Dolors Gir´ o-Formatger & Laia Lacueva-P´ erez, 2023-Spain	results			in a pilot group at 6 months.	scoring expected impact was improvement in patients' experience (4.25/5). Years of nursing experience were negatively correlated with preparedness and the expectation of an increase in patient management errors
A7: Casey M, Rohde D, Higgins A, Buckley T, Cashin A, Fong J, Hughes, M & McHugh, A (2020). Ireland	Providing a complete episode of care": A survey of a registered nurse & registered midwife prescribing behaviours & practices	Cross-sectional national study	Online Survey	To describe the prescribing behaviors & practices of registered nurse and midwife prescribers	-Nurse and midwife prescribers engaged in similar prescribing behaviors spanning the range of activities from initiating new medications to Ceasing medicines -The most frequently selected criterion for prescribing was clinical effectiveness
A8: Joan E. Tranmer, Lindsey Colley, Dana S. Edge, Kim Sears, Elizabeth VanDenKerkhof, Linda Levesque (2015), Canada	Trends in nurse practitioners' prescribing to older adults in Ontario, 2000–2010:	Retrospective cohort study	Population-based retrospective cohort study using four administrative health databases	To describe the trends & patterns in medication prescription to adults 65 years of age or older in Ontario by nurse practitioners over 10 years	Prescribing of medication by nurse practitioners, particularly for chronic conditions, increased for ten years in Ontario-Canada.
A9: Qi Zhou, Yiqing Xu, Lili Yang and Rashid Menhas. 2024- China	Attitudes of the public & medical professionals toward nurse prescribing: A text-mining study based on social medias	Quantitative research	Python method through internet platforms	To explore the public & medical professionals' concerns & attitudes toward nurse prescribing.	Public & medical professionals held a negative attitude toward nurse prescribing, & few had a prudent positive attitude. The Public is concerned about the impact of nurse prescribing on medical professionals & the competency requirements for nurses
A10: Kurosh Jodaki, Mohammad Abbasi & Nahid Dehghan Nayeri, 2024- Iran	Nurses' Experiences of Practical Challenges Associated with Nurses' Prescription: A Qualitative Study	Qualitative study	Semi-Structured Interview	To explaining the challenges of nurse prescription in Iran based on the nurses' experiences.	Structural challenges such as legal issues, personal related barriers such as nurse & physician related barriers, inter-professional separations and society's attitude towards nurse prescribing & negative attitude of physician toward nurse prescribing was explained in this study
A11: Yu Wu, Jian Liu, Lovel Fornah, Zeping Yan, Lijun Meng & Shicai Wu, 2025 –China	The attitudes of physicians toward nurse prescribing rights: a cross-sectional study	Cross section study (descriptive study)	Online & face to face Questionnaire	1. To Explore the attitudes of physicians toward nurse prescribing rights, and 2. To explore the factors correlated with physicians' attitudes toward nurses' prescribing rights.	1. Most physicians expressed a favorable attitude toward nurse prescribing rights (53.57%) 2. Factors, including sex, nurse-physician collaboration and knowledge of nurse prescribing rights were correlated with physicians' attitudes toward nurse prescribing rights
A12: Faty Seck, Olga Masot, Nicola Carey, Judith Roca, Teresa Botigué, Elena Paraíso Pueyo & Ana Lavedán Santamaría, 2023-Spain	Nurses' perceived barriers & facilitators to the implementation of nurse prescribing: Delphi study & focus group	Delphi study & focus group	Interview & closed-ended questionnaire	To obtain consensus on barriers and facilitators to nurse prescribing following its recent introduction in Spain.	15 barriers and 18 facilitators were explored in this study. No general consensus was found with respect to the prioritization of these barriers/ facilitators. Highlighted barriers were the dependence on the figure of the physician, insufficient training in pharmacology, lack of institutional

Continue

TABLE 1: Continued

Author, date & country	Title of the article	Study design	Methods of data collection	Objectives of the study	Key Results of the study
					pharmacology, lack of institutional support and a limited list of products that can be prescribed. The highlighted facilitators were the academic knowledge and ongoing training and education
A13: Olga CanetVélez, Gloria Jodar Solà, Jaume Martín Royo, Enric Mateo, Rocio Casañas & Paola Galbany Estragués, 2023-Spain	Experience of Spanish nurses in the rollout of nurse prescribing: a qualitative study	descriptive qualitative study	semi structured individual interviews and discussion groups	To describe the experiences of nurses in the rollout of nurse prescribing	- Internal barriers toward nurse prescribing were identified such as lack of training in pharmacology & External barriers such as lack of confidence in nursing skills. - Strategies employed to boost nurse prescribing are such as explaining nurses' preparation for prescribing and increasing the catalogue of drugs, supplies, and treatments that nurses can prescribe.
A14: Azam Naderi, Abbas Abbaszadeh, Marzieh Pazokian, Camelia Rohani & Rostam Jalali, 2021-Iran	The expansion of the role of nurse prescribing in intensive care units in the healthcare system of Iran: a qualitative content analysis	Qualitative study	semi-structured interviews	To explore the experiences of experts regarding the expansion of prescribing medication roles by the ICU nurses	Findings confirm the possibility of legalizing and implementing medication prescription by ICU nurses in the Iranian healthcare system. Successful global experiences and "inspiration from credible reports" were among the facilitators of nurse prescribing. A low number of physicians, especially in the underdeveloped and remote areas, creates an opportunity to expand the role of nurses

TABLE 2: Results of Quality Assessment Results of the Included Articles by using Mixed Method Appraisal Tool Ver-sion 2018 (MMAT-2018)

Design	Question	Articles included in the quality assessment and the study country													
		A1: Hopia, H et al, (2016), Finland	A2: Claudia, B. maier (2019), Ireland	A3: Anecita, G, L, et al (2017), New Zealand.	A4: Kelly N, (2018), England	A5: Msuya, M. et all (2017), Tanzania	A6: Esteban-Sepúlveda, S (2023), Spain	A7: Casey, M (2020), Ireland	A8: Joan E. Tranmer, et all (2015), Ontario-Canada	A9: Zhou, Q et all, (2024), China	A10: Jodaki, k, et al (2024)-Iran	A11: Wu, yu et al (2025) -China	A12: Seck, F et al (2023)-Spain	A13: Olga CanetVélez, O et al (2023)-Spain	A14: Naderi, A et al (2021)-Iran
Qualitative studies	Is the qualitative approach appropriate to answer the research question?	Yes	Yes								Yes			Yes	Yes
	Are the qualitative data collection methods adequate to address the research question?	Yes	Yes								Yes			Yes	Yes
	Are the findings adequately derived from the data?	Yes	Yes								Yes			Yes	Yes
	Is the interpretation of results sufficiently substantiated by data?	Yes	Yes								Yes			Yes	Yes
	Is there coherence between qualitative data sources, collection, analysis & interpretation?	Yes	Yes								Yes			Yes	Yes
Quantitative descriptive	Is the sampling strategy relevant to address the research question?			Yes		Yes	Yes	Yes	Yes	Yes		Yes			
	Is the sample representative of the target population?			Yes		Yes	Yes	Yes	Yes	Yes		Yes			
	Are the measurements appropriate?			Yes		Yes	Yes	Yes	Yes	Yes		Yes			
	Is the risk of nonresponse bias low?			Yes		Yes	Yes	Yes	Yes	Yes		Yes			
	Is the statistical analysis appropriate to answer the research question?			Yes		Yes	Yes	Yes	Yes	Yes		Yes			
Mixed methods	Is there an adequate rationale for using a mixed method design to address the research question?				Yes								Yes		

Continue

TABLE 2: Continued

Design	Question	Articles included in the quality assessment and the study country													
		A1: Hopia, H et al, (2016), Finland	A2: Claudia, B. maier (2019), Ireland	A3: Anecita, G, L, et al (2017), New Zealand.	A4: Kelly N, (2018), England	A5: Msuya, M. et all (2017), Tanzania	A6: Esteban-Sepúlveda, S (2023), Spain	A7: Casey, M (2020), Ireland	A8: Joan E. Tranmer, et all (2015), Ontario-Canada	A9: Zhou, Q et all, (2024), China	A10: Jodaki, K, et al (2024)-Iran	A11: Wu, yu et al (2025) -China	A12: Seck, F et al (2023)-Spain	A13: Olga CanetVélez, O et al (2023)-Spain	A14: Naderi, A et al (2021)-Iran
	Are the different components of the study effectively integrated to answer the research question?	Yes											Yes		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Yes											Yes		
	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Yes											cant tell		
	Do the different components 0f the study adhere to the quality criteria of each tradition of the methods involved?	Yes											Yes		

DISCUSSION

This review found that nurse prescribing remains a relatively new role and has faced implementation challenges across different countries. Countries including Australia, Botswana, Canada, Kenya, New Zealand, Namibia, the Republic of Ireland, South Africa, Sweden, Uganda, the United Kingdom (UK), and the United States of America (USA) have legally recognized nurse prescribers.[34] Legislation supporting non-physician prescribing also exists in Cameroon, Zimbabwe, Rwanda, Swaziland, Malawi, Tanzania, Zambia, Ghana, Lesotho, and Ethiopia, although specific legislative documents remain limited.[34]

In the United States of America, nurse practitioners (NPs) have legal authority to prescribe medicines across all states and the District of Columbia, although the degree of prescribing independence varies.[35] More than 25 states and the District of Columbia permit experienced NPs to prescribe independently without physician involvement, including controlled substances.[35] Nurse prescribing has existed in the United States for over fifty years, with individual states establishing specific practice and certification requirements.[36,37]

In the UK, nurses are authorized to prescribe medicines independently, with the exception of certain controlled substances. Although the implementation of nurse prescribing initially encountered resistance and concerns from physicians, evidence has shown positive outcomes. Nurse specialists working in diabetic clinics have enhanced patient experiences by providing clear information and conducting less hurried consultations, which has contributed to higher levels of patient satisfaction.[3,38,3]

The implementation of nurse prescribing in Ireland followed extensive educational and regulatory preparation. Entry requirements include registration as a nurse or midwife, a minimum of three years of relevant clinical experience, and educational qualifications equivalent to Level 8 competencies. Eligible nurses and midwives must complete a rigorous six-month programme comprising both theoretical and practical training before being granted prescribing authority. These findings suggest that countries establish specific educational requirements, regulations, and standards to support the effective implementation of nurse prescribing.[40]

Evidence shows that nurse prescribing improves patient outcomes and satisfaction.[41,42] Increased satisfaction has been associated with greater autonomy and improved holistic care delivery.[42–44] Such outcomes have contributed to successful implementation and positive healthcare impacts of nurse prescribing role.

In Africa, only a few countries legally authorize nurses to prescribe medicines. Expanding access to medicines and responding to healthcare demands were key drivers for implementation.[34] In South Africa, nurses have legally prescribed and dispensed medicines since 1994, although prescribing remains regulated.[45] However, uncertainty remains regarding required training and authorization categories.[46] In Nigeria, nurses are legally permitted to prescribe medicines without physician supervision.[47] In Botswana, nurse practitioners require at least two years of experience and a bachelor's degree before prescribing.[48]

A review from the Netherlands found that nurses prescribed comparable types and doses of medicines as physicians.[49] Clinical outcomes were equal or better in nurse-led care, while patient satisfaction was higher.[49] Similarly, a study found no differences between nurse and physician prescribers regarding experience, safety, treatment adherence, and quality of care.[50]

Mental health nurse specialists in England use prescribing as an advanced practice approach to meet the needs of increasingly complex patient populations.[31] However, resistance to expanding nurse prescribing roles remains linked to negative physician attitudes and traditional professional hierarchies.[2,26,51] This perception overlooks the complementary and collaborative nature of healthcare professions.

Following implementation across countries, substantial variation exists in educational preparation, supervision requirements, and prescribing authority.[52] These differences are regulated according to national contexts and professional standards. Across several countries with nurse prescribing role, the challenges and barriers looks like nearly similar, these similarities reflect common challenges in expanding the nurses' professional roles within traditional physician led healthcare system

This review demonstrates that nurse prescribing is an emerging role whose implementation has followed structured legal and professional processes across countries. Future studies should focus on preparedness for nurse prescribing roles, implementation impacts, potential unintended consequences, and strategies to address associated challenges.

Implication to Tanzanian Nursing Prescribing Practice

Tanzania continues to experience severe shortages of healthcare workers. In 2023, the healthcare workforce ratio was reported as one doctor per 8,882 population and one nurse per 1,289 population, remaining below WHO recommendations.[53] Physician shortages, particularly in rural areas, have compelled nurses to work beyond their educational preparation and scope of practice, including prescribing medicines and performing minor procedures.[21]

Healthcare worker shortages have also required medical attendants to assess, diagnose, and treat patients beyond their expected responsibilities.[54] Tanzanian legislation permits nurses to prescribe medicines only under specific circumstances.[6] This differs from many developed countries where nurses with specialized training can prescribe independently because prescribing content is incorporated into educational curricula.[55]

The TNMC scope of practice states that *"In the absence or shortage of a medical clinician, the nurse shall prescribe medicines, perform minor surgical procedures, and carry out other complex tasks requiring special knowledge as per relevant protocols and according to the providers' knowledge, skill, and judgment."*[6] However, nurses do not possess prescribing code numbers and are not formally recognized as prescribers by the Ministry of Health, creating uncertainty regarding implementation.

This review highlights the need for specialized training for nurses, particularly those with bachelor 's-level

education and above, to support prescribing practices in Tanzania. Such initiatives may improve healthcare access and maximize available workforce capacity. However, implementation would require collaboration among stakeholders to establish minimum educational and training requirements appropriate for the Tanzanian healthcare context.

This review also emphasizes the role of nursing and midwifery regulatory bodies in guiding healthcare practice changes, including additional prescribing education. Lessons from countries such as South England[55,56] may inform future implementation approaches. According to the International Council of Nurses (ICN), five prescribing models exist: independent prescribing, dependent (supplementary) prescribing, prescribing via structured protocols, prescribing to administer, and time-and-dose prescribing.[16]

To support implementation in Tanzania, dependent prescribing for bachelor level nurses and independent prescribing for nurses with master's level education may serve as initial models. These nurses possess foundational knowledge in physiology, anatomy, biochemistry, microbiology, clinical pharmacology, and related sciences integrated within their curricula. However, these models require further discussion among stakeholders before implementation within the Tanzanian healthcare context.

Study Limitations

One limitation of this review is the restriction to published peer-reviewed literature, which may have excluded relevant grey literature and policy documents related to nurse prescribing. However, inclusion of peer-reviewed evidence was considered important to ensure methodological rigor and support discussion of current prescribing outcomes.

Additionally, published literature addressing nurse prescribing authority in Tanzania remains limited. Consequently, evidence from studies conducted in other countries and literature related to nursing scope of practice was used to inform discussion within the Tanzanian context.

CONCLUSION AND RECOMMENDATIONS

This review found that nurses can prescribe medicines depending on country-specific legislation. Although the TNMC scope of practice permits prescribing under some advanced nursing roles, the authority remains insufficiently defined because nurses are not legally authorized to prescribe independently in routine settings.

This challenge is further influenced by limited prescribing content within nursing curricula and concerns regarding role overlap between nurses and physicians. Additional education on medication prescribing is needed in Tanzania, particularly for nurses with bachelor-level education and above.

The TNMC, together with relevant stakeholders, should initiate discussions to establish clearly defined prescribing roles and regulations, including specific prescribing code numbers. Prescribing education should also be incorporated into nursing curricula, particularly for ANPs, with clear specification of practice areas. These measures may improve healthcare quality, maximize nurses' expertise, and support continued advancement of the nursing profession.

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Peer Reviewed

Competing Interests: Authors declare no competing interest.

Funding: The study received funding the Laerdal Foundation, Stavanger, Norway, under its funding line "Saving lives at birth" as part of a larger project to empower parents to care for their sick or preterm newborn through a structured training package based on ENC.

Received: 15 October 2025 ; **Accepted:** 03 June 2026

Cite this article as Duma AA, Iseselo KM, Mkoka AD. Nurse Prescribing Practices: An International Systematic Review with Implications for Tanzania . *East Afr Health Res J.* 2026;10(1):205-220. https://doi.org/10.24248/eahrj.v10i1.887