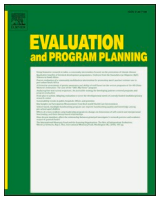
Evaluation and Program Planning 91 (2022) 102061

Contents lists available at ScienceDirect

Evaluation and Program Planning

journal homepage: www.elsevier.com/locate/evalprogplan



Development of a capability maturity model for the establishment of children's nursing training programmes in southern and eastern Africa

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ARTICLE INFO

Keywords:
Health workforce
Nursing
Paediatrics
Child
Regulation
Education
Training
Stakeholders

ABSTRACT

Establishing sustainable training to strengthen human resources for health for children's nursing in Africa requires stakeholders to navigate complex pathways spanning multiple regulatory systems and sectors. Incomplete stakeholder insight threatens long-term sustainability of new training programmes. We drew on collective experiential knowledge of capacity building for children's nursing in southern and eastern Africa to articulate a Capability Maturity Model (CMM), using a six-stage process to: identify necessary supportive conditions; specify levels of process maturity; develop domains; characterise levels of capability; consult with stakeholders; and finalise the model. We articulated a comprehensive CMM describing five levels of process maturity in relation to education, clinical and regulatory systems, human resources for health systems, and requirements related to overall stakeholder collaboration. The model makes visible the range of regulatory and associated processes involved in developing a new educational programme for specialist nurses, including educational standards, quality assurance, scopes of practice, and systems for licensing and registering specialist children's nurses. Stakeholders can use the model as a map to identify where they are in the process, and establish the resources and actions needed to make further progress.

1. Introduction

Appropriate education programmes are necessary to ensure an adequate supply of specialist nurses to meet the urgent demand across health systems worldwide (World Health Organization, 2020a, 2020b). A growing number of African countries are prioritising the development of the specialist children's nursing workforce, recognising the potential for skilled children's nurses to contribute to improved health outcomes for children (North, Sung-King & Coetzee, 2019) However, there are concerns about the sustainability of some health workforce development and training initiatives in low- and middle-income countries (Global Health Workforce Alliance, 2008).

Since 2008 The Harry Crossley Children's Nursing Development Unit (CNDU) at the University of Cape Town has assisted colleagues at seven schools of nursing in six African countries (Botswana, Kenya, Malawi, Namibia, Zambia and Zimbabwe) to establish nine new children's nursing training programmes (Ruthe & North, 2020). In addition CNDU has established two entirely new children's nursing educational programmes and re-established a third programme in South Africa. These experiences have generated rich process learning which to date had not been formally recorded. In 2020 CNDU was asked by the Vitol Foundation to capture this learning in the form of a Capability Maturity Model, which we believe represents the first instance of applying this approach to the development of specialist nursing education programmes.

Building sustainable capacity in specialist nursing education requires the development of supportive conditions created through policies, frameworks and strategies, requiring collaborative efforts by multiple stakeholders (ICN, 2020). In our work to help establish new children's nursing educational programmes in Africa, we have observed that the impetus for starting new programmes can be varied. New programmes may be initiated in response to urgent need (for example, to staff and open a newly built facility), a time limited opportunity (such as the availability of donor funding), or the vision and motivation of a committed individual.

Achieving the necessary degree of integration and stakeholder collaboration can be difficult to achieve when stakeholders are working at speed, with an incomplete view of the wider system or the operational

Abbreviations: CMM, capability maturity model; CNDU, children's nursing development unit.

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https://doi.org/10.1016/j.evalprogplan.2022.102061
Received 1 July 2021; Received in revised form 18 September 2021; Accepted 20 February 2022
Available online 23 February 2022

considerations of other sectors and institutions (World Health Organization, 2007). The task for a lecturer tasked with establishing a new programme is especially challenging. Nurses educators are experts in clinical teaching and learning, but may have had limited prior exposure to other key stakeholders central to this task. Educators may not anticipate therefore why a provincial employer cannot release nurses from clinical services to undertake training in large numbers. This problem of imperfect knowledge extends to other stakeholders: a consultant doctor in paediatrics may not be aware of the full resources required to start and sustain a new training programme, or the regulatory framework governing provision of accredited nurse training. These considerations have considerable bearing on the longer-term sustainability of training programmes intended to strengthen human resources for health. We have observed on occasion that some individuals have started on a pathway that is not fully navigable to the end, because essential conditions are not yet in place, and because the necessary engagement and contributions from all stakeholders have not been secured.

The necessary supportive conditions required to establish a sustainable children's nursing education programme can be described comprehensively and systematically in the form of a Capability Maturity Model. A Capability Maturity Model depicts the organisational processes, practices and behaviours (the supportive conditions) that reliably and sustainably produce required outcomes (Hammond, Bailey, Boucher, Spohr, & Whitekar, 2010). These supportive conditions are commonly represented as a three- to six-stage stepwise progression spanning the earliest stages of a process through to achieving the desired level of development or maturity (Carvalho, Rocha, & Abreu, 2016). The intention is that by identifying critical success factors and enabling objective measurement, institutions will be able to assess their capacity, processes, and structures and engage in a process of continuous improvement, within the context of the wider system (Measure Evaluation, 2019).

The USAID-funded Measure Evaluation project has described six instances of applying the capability maturity model approach to strengthen health data systems (Measure Evaluation, 2018). A staged capability maturity model approach has also been used successfully to support and measure progress towards health profession regulation strengthening in Africa through the development of a Regulatory Function Framework used to evaluate progress in key regulatory functions (McCarthy, Kelley, Verani, Louis, & Riley, 2014; Dynes *et al.* 2016).

In taking forwards this work, we explicitly adopted an assets-based approach which makes visible and values the skills, knowledge, potential and resources in a system and among stakeholder groups (Glasgow Centre for Population Health, 2012) consistent with principles of participatory educational practice and research design.

2. Methods

2.1. Aim and objectives

In undertaking this project, our aim was to utilise learning gained through experience to develop a capability maturity model which describes the essential capacity required to establish a new children's nursing education programme.

Objectives were to:

- Identify the full range of supportive conditions that must be in place to enable the development of new children's nursing education programmes;
- Describe the key functions and responsibilities of the major stakeholder groups who need to contribute to the development of new children's nursing education programmes; and
- Access collective expertise by engaging with the community of children's nursing education practitioners in southern and eastern Africa.

Our intention was that the resulting capability maturity model could enable stakeholders to assess their current level of capability maturity in relation to each domain, stimulating reflection and process improvements, ultimately supporting the development of high-quality sustainable training provision for children's nursing, primarily in Africa.

2.2. Development process

We followed methods described by McCarthy et al. (2014) and Measure Evaluation Systems (2018). The process of developing the capability maturity model involved six main phases of activity, as follows:

i. Identification of relevant processes, practices and behaviours;
ii. Specification of the levels of process maturity;
iii. Development of domains with definitions;
iv. Characterisation of different levels of capability;
v. Consultation with stakeholders; and
vi. Incorporation of consultation responses and finalisation of the model

The worked together to complete all stages of the process. A monitoring and evaluation specialist external to the programme provided additional facilitation of the process. The process was completed between July and October 2020. A record was maintained of the process followed, together with reflections on the process. The stages of development are reported below in such a way that others could reproduce the process.

i) Identification of relevant processes, practices and behaviours

In order to identify the organisational processes, practices and behaviours (the supportive conditions) that contribute to the establishment of a new children's nursing education programme, we referred to records and accounts of relevant new training programme development (e.g. Coetzee *et al.* 2016) and unpublished programme documentation including travel and seminar reports, annual reports and conference presentations. This was intended to ensure that the model would be grounded in the collective experience and knowledge of establishing new children's nursing educational programmes within the southern and eastern African region.

ii) Specification of the levels of process maturity

The processes, practices and behaviours identified through review of programme documentation were used to develop macro-descriptions for five levels of process maturity (see Table 1), guided by completion of the statement: 'A successful sustainable children's nursing education programme has/is.?'. We found it helpful to begin at the end by describing full maturity, before working backwards.

The macro-descriptions of the levels were intended to describe all relevant aspects of the process at high level. The intention was that the macro-descriptors should contain sufficient information about the 'whole picture' so that the essential elements would be visible to any stakeholder as part of an integrated process. Information contained in the macro-descriptors related to conditions that enable necessary actions/progress, guided by the prompt: 'What needs to be in place to enable all actors to do their work?'.

iii) Development of domains with definitions

The review of programme documentation described above included a framework to guide stakeholder collaboration which was developed at a colloquium of South African stakeholders in children's nursing education (Coetzee, 2014) and has been routinely used by CNDU as part of new educational programme development activities with teams in other African countries subsequently (Coetzee et al., 2016). This framework was used to

Table 1
Domains and definitions.

Domain	Domain definition
Education system capacity	The perceived abilities, skills, and expertise of leaders, teachers, faculties, and staff in education institutions to execute or accomplish something specific, such as leading a school-improvement effort or teaching more effectively (Glossary of Educational Reform, n. d.).
Clinical system capacity	A capacitated clinical system able to support the establishment of new training programmes has adequate appropriately trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies (World Health Organization, 2020a, 2020b).
Human resources for health information and planning capacity (HRH)	The concept of Human Resources for Health comprises planned endeavours intended to increase the capacity of the health workforce in order to optimise health system functioning and ultimately enhance health. The health workforce is defined by the WHO as "all people engaged in actions whose primary intent is to enhance health" (World Health Organization, 2006). Hunter, Dal Poz, and Kunjumen (2009) describe the health workforce as a key building block of health systems, with health workforce strengthening identified as a priority for action for strengthening those systems in global policy directions.
Regulatory system capacity	The action or process of officially recognizing an individual practitioner or an institution as having a particular status or being qualified to perform a particular activity. Nursing and midwifery legislation and regulations provide for i) the children's specialist nursing role ii) category of professional registration for children's nurses iii) defined Scope of practice, iv) licensing process v) accredited children's nursing training provision including curricula and institutions (McCarthy et al., 2014).
Stakeholder collaboration	Deverka et al. (2012) define stakeholders as individuals, organizations or communities that have a direct interest in the process and outcomes of a project, research or policy endeavor. Bi-directionality is an important component of mature stakeholder collaboration. Five levels of stakeholder engagement are defined: minimal awareness and interaction; consultation; engagement; participation; and bi-directional collaboration among stakeholders enabling opportunities for reciprocal learning and shared decision-making. The ultimate goal of the process is partnership between stakeholders.

structure the domains of the Capability Maturity Model (see Table 1) in order to meet the need to describe processes, practices and behaviours at both individual and organisational tiers, as noted above.

We identified definitions for each domain from the literature and recorded these to reduce ambiguity and enable consistent application. As we identified definitions, we found this assisted us in clarifying the steps in a process from nascent to established. For example, applying the definition developed by Deverka *et al.* (2012) helped us identify a progessive description of stakeholder collaboration as detailed in Table 1.

In addition to the four single-stakeholder domains of the education system, clinical system, human resources for health (HRH), and regulatory system, we defined a fifth multi-stakeholder domain which we called stakeholder collaboration.

iv) Characterisation of different levels of capability

The processes, practices and behaviours identified through review of programme documentation and other literature were allocated to the relevant stakeholder domains. Steps within the domains of human resources and the regulatory system were both readily summarised since we were working from the existing Capability Maturity Models for health information systems (Measure Evaluation, 2018) and regulatory system capacity (McCarthy et al., 2014). Similarly, classification of levels of stakeholder engagement were developed with reference to Deverka et al. (2012).

For each aspect of capability, a statement describing full capability maturity was developed first and recorded under Level 5, followed by statements describing capability at the other levels. After developing the initial statements under each level, the horizontal and vertical alignment of the statements was reviewed to achieve consistency with regard to chronology and sequencing of interdependent events and conditions.

v) Consultation with stakeholders

We sought input and comment on the draft model from practitioners from all the stakeholder groups featured in the CMM. We held an online videocall discussion with participants representing 11 schools of nursing across nine African countries at the Children's Nurse Educator Forum in September 2020. We shared the draft model widely through our networks and invited feedback. We also held two online video call sessions which were open to any stakeholders who preferred to offer their feedback through dialogue. We asked stakeholders to comment on how closely the organisational processes, practices and behaviours described matched the consultee's own health system, and to provide suggestions for improving the relevance, applicability or understandability of the information presented.

3. Results

The process described above resulted in a set of five step-wise progressions for each of the five domains (see Fig. 1) and the creation of the Capability Maturity Model presented in Fig. 2. Key outcomes and results of the process of development are reported below.

The review of programme documentation and reflection on experiential knowledge determined that this capability maturity model would need to describe multidimensional processes, practices and behaviours at both individual and organisational tiers. Five levels of process maturity were identified, and these were described in the form of macro-descriptions as shown in Fig. 1.

The Capability Maturity Model presented in Fig. 2 describes the five different levels of capability for each of the domains and stakeholder functions. There was some debate around the extent to which statements should represent the ideal vs the likely reality. For example, the statement 'A new in-country training programme fully aligned with local needs and resources is accredited' was originally included under the macro-descriptor for Level 3. This was changed to 'A new in-country training programme … with explicit reference to local population needs and resources'. This change was decided on to signal a difference from the fully mature capability described at Level 5, recognizing that after initial work to develop a programme informed by local needs and resources, collaborative review and refinement would be required to achieve full alignment.

Some of the processes represented were found to be iterative. For example, developing the capacity to refine the curriculum to be contextually specific, or the development of educator skills to deliver active learning, both occur iteratively over the course of Levels 3, 4 and 5. There was only one domain (education systems) for which sub-domains were required. The additional level of detail for this domain is consistent

Level	Description
Level 1: Nascent	*General nurse and midwifery training is securely established, but children's nursing training programmes and trained children's nurses are absent.* *Actions towards establishing training programmes may be happening by chance, or represent isolated, ad hoc, or individual heroic efforts.* *Initial advocacy and proposals might be in process.*
Level 2: Emerging	*The systems, processes and resources for establishing training programmes are defined and increasingly functional.* *A new in-country training programme aligned with local needs and resources is accredited through institutional and national regulatory routes.* *Development of core specialist clinical and educator workforce required to deliver the new programme through staged release.* *Stakeholders begin to exchange available workforce and training data, and identify additional data needs.*
Level 3: Established	*The systems, processes and resources for establishing training programmes are beginning to be defined, but some important components may be incomplete.* *There is an in-principle agreement by the Ministry of Health that there is a need for a training programme.*
Level 4: Institutionalised	*Well-established framework for implementation as part of strongly aligned national and regional strategies, policies, processes and resourcing for child health and workforce development.* *Training activity is directed by a shared strategy which is informed by accurate data about the children's nursing workforce, clinical service needs, and training activity.*
Level 5: Optimised	*The systems, processes and resources for establishing education programmes are regularly reviewed and opportunities for learning and improvement are taken.* *Stakeholder collaboration is mature, with well-established interpersonal and inter-organisational relationships.* *Education institutions and clinical services can deliver and absorb trainees, with routine recording of specialist qualifications and clear employment pathways.* *The contribution of children's specialist nurses to the health system is visible.*

Fig. 1. Step-wise domain progression from nascent to established.

with the core focus of this Capability Maturity Model, which concerns the capacity to establish a new training programme, recognising that a senior nursing educator within a School of Nursing is likely to be the individual charged with leading this process.

A total of 36 stakeholders provided comments and suggestions. We received detailed input from stakeholders in Namibia, Rwanda, South Africa, Zambia and Zimbabwe, working within the stakeholder domains of education, clinical or regulatory systems, and human resources for health. There were no inconsistencies in the feedback received, and all suggestions were incorporated into a revised version of the Capability Maturity Model, including revisions to the macro-descriptors. Substantive revisions made as a result of feedback received included strengthening the importance given to securing a mandate from the ministry of education, and providing a clearer description of the resourcing required to start up a new programme. All stakeholders confirmed that the draft Capability Maturity Model was a helpful way of describing the process of establishing new children's nursing training programmes, and that the organisational processes, practices and behaviours described matched their own health system sufficiently closely for the model to be easily applicable.

4. Discussion

The Capability Maturity Model that was developed defines five domains that are critical to establishing nursing education programmes, and describes a navigable pathway from first steps to sustainable programme maturity. The model makes visible the very wide range of regulatory and associated processes involved in establishing a new training programme, including educational standards, quality assurance, graduates' intended scopes of practice, and systems for licensing and registering specialist children's nurses. In doing this, the model achieves one of the chief benefits of the CMM approach, by making the responsibilities of stakeholders explicit and providing a supportive framework for collaboration (Measure Evaluation, 2018). Stakeholders are therefore able to use the model as a roadmap, to identify where they are and what actions and resources are needed to reach their shared destination.

In highlighting the resources needed to make progress and build the desired system capacity we have tried to adhere to the values and principles of an asset-based approach (Glasgow Centre for Population Health, 2012) striking a balance between steps that will meet urgent needs in the short-term and steps that will nurture the strengths and

Domain	Sub-Domain	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalised	Level 5: Optimised
1. Education system	Capacity for programme design and delivery	There is no programme or curriculum.	Outline curriculum is developed.	Full curriculum is developed and implemented.	There is ongoing review and refinement of curriculum.	The curriculum is a dynamic and responsive framework which drives meaningful learning for students, meeting service and stakeholder needs.
		There is little clarity regarding desired scope of practice for graduates, or service needs.	A collaborative assessment of desired scope of practice and clinical services needs is conducted with clinical and Human Resources for Health (HRH) stakeholders.	The curriculum learning outcomes are aligned with the agreed scope of practice and clinical service needs.	There is ongoing delivery of curriculum aligned with clinical service needs.	Priorities for curriculum content are regularly revised in consultation with clinical and HRH stakeholders.
		Programme development is disconnected from the national qualifications framework.	Outline curriculum is aligned with the national qualifications framework. Transitional programmes and bridging courses may be defined to fill educational gaps and enable progress to this standard.	Full curriculum is accredited by nursing and higher education regulators.	There is ongoing delivery of curriculum aligned with the national qualifications framework. Transitional programmes and bridging courses are phased out.	Refinement of curriculum happens in tandem with evolution of national qualifications framework.
		Development of teaching and learning practices has not commenced.	Thought is given to incorporating locally-relevant research, knowledge and professional practices into the curriculum.	Clinical placements are organised, and teaching materials are developed, incorporating locally relevant research, knowledge and professional practices.	Governance arrangements to ensure educational quality are securely established. Locally relevant research, knowledge and professional practices are integral to teaching and learning.	Reflection and review enables continuous improvement of teaching and learning.

Domain	Sub-Domain	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalised	Level 5: Optimised
		The institution lacks essential infrastructure and processes to support new programme delivery.	Plans to develop institutional processes and infrastructure to enable programme delivery and student participation are made.	Institutional infrastructure to enable programme delivery and student participation is in place.	There are well-established institutional processes regarding timetables, schedules and clinical rotations.	Institutional infrastructure and processes for programme delivery are maintained.
		There is no student throughput.	Processes have been developed to recruit students to the new programme.	First student intake has occurred.	Regular student intakes have occurred.	There is regular throughput of students that is responsive to workforce plans.
	Academic and clinical educator workforce capacity	There are no specialist children's nursing educator posts.	There are children's nursing educator posts, but they are not filled.	There is one educator with appropriate qualification and suitable clinical expertise in post.	There are sufficient educators (two or more) with appropriate qualification and suitable clinical expertise in post, for whom the programme is their main affiliation.	Established educator teams are part of self-sustaining regional networks and a community of practice, for example sharing learning and benchmarking.
		There are few or no suitably qualified or experienced nurses available to recruit as educators.	Funding for the preparation of appropriately qualified children's nurses to become educators has been obtained, and planning for a sustainably expanded educator workforce has been conducted.	Experienced children's nurses undertake studies leading to the award of required educator qualifications.	Programme graduates are beginning to contribute to teaching and learning in the classroom and as clinical educators.	Programme graduates are regularly contributing to teaching and learning in the classroom and as clinical educators.
		Academic and clinical educators do not have support to develop their skills and competence.	Urgent training needs are addressed through interim training courses by sending educators to train in other countries and/or utilising visiting faculty.	Educators are assisted to develop skills and competence through mentoring and internships with regional peers.	Educators are increasingly skilled in active learning techniques and competency- and skills-based teaching and learning.	Educators increasingly contribute as external advisers, reviewers and moderators for other institutions.

Fig. 2. A capability maturity model for the establishment of children's nursing training programmes.

resources of individuals and organisations connected to children's nursing over the longer term. We have also intentionally included objectively identifiable actions, behaviours and processes designed to facilitate the 'everyday doing' of education (Ramugondo, 2015) in ways that facilitate the development of occupational consciousness as a deliberate strategy in educational practice development uniquely suited to post-colonial and post-apartheid African societies.

The process that was followed and the Capability Maturity Model that resulted have both strengths and limitations. The model benefits from the application of considerable experiential knowledge from multiple individuals representing a comprehensive set of stakeholder groups, combined with information gained from published research and other documentation. We anticipate that this will have supported accuracy. The model does not describe all of the functions of the many

Domain	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalised	Level 5: Optimised
2. Clinical system capacity: training and utilising specialist children's nurses	There are no or few specialist nurses in clinical service delivery and multidisciplinary teams.	Clinical services stakeholders are involved in planning future workforce and in articulating roles and expectations of specialist nurses.	Posts for specialist nurses are established.	Posts for specialist nurses are filled. Specialist nurses are an established part of the clinical services workforce.	Specialist nurses are securely established as part of multidisciplinary teams. Specialist nurses are in leadership roles, optimising care delivery in existing and planned services.
	There are no training plans for specialist nurses, or training plans are disconnected from existing nursing workforce capacity.	Training plans to develop and resource paediatric services aligned with Human Resources for Health (HRH) strategy are formulated.	Clinical services have scheduled plans for releasing nurses for training and absorbing graduates into specialist roles in clinical services on return.	Additional clinical facilities are being accredited to extend the training platform.	Graduates in practice are utilised as clinical educators. There are sufficient accredited clinical training sites to meet ongoing demand.

Domain	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalised	Level 5: Optimised
3. Human resources for health information and planning capacity (HRH)	Plans for nursing workforce development deal with specialist children's nursing workforce only superficially, without clear vision for the role and contribution of specialist children's nurses.	A combined strategy has been developed by Ministry of Health (MoH), clinical services and education to identify an initial cohort of trainees to undergo training to seed selected units and facilities with specialist clinical staff. Plans to establish of posts.	Strategic plans for children's nursing training and workforce development are in place. Children's nursing training plans are aligned with current policy and regulatory framework, MoH programmes and local health service needs. Posts for specialist children's nurses are established and resourced.	Monitoring of progress towards strategic goals articulated in the workforce development plan involves multiple stakeholders.	The expected contribution of the specialist children's nurse is clearly articulated in HRH policies, based on shared stakeholder visions.
	Little data is available about the existing children's nursing workforce capacity.	Initial data gathering to inform a more deliberate strategy for workforce development has occurred.	Systematic data collection is enabling monitoring of progress.	Systematic data collection informs dialogue and information exchange between all stakeholders.	Systematic data collection is ongoing. Effective tracking of deployment and utilisation of children's nurses feeding back into workforce and training plans.
	There is little or no dedicated resourcing or funding for children's nursing workforce and education capacity development.	Funding for student sourced and allocated, especially for upskilling lecturers who might have to go out of country. Funded educator posts are established.	Systems for releasing nurses for training and associated funding streams are in place, in collaboration with clinical services.	Systems for releasing nurses for training and associated funding streams have been mainstreamed. Processes for absorbing graduates back into the workforce are well established.	At least 85% of programme graduates are employed in specialist children's nursing roles with appropriate remuneration on graduation.

Fig. 2. (*continued*).

organisations and stakeholders represented, and instead focuses on a limited set of functions critical to the establishment of new children's nursing training programmes. HRH capacity and regulatory capacity are comprehensively addressed by existing CMMs (McCarthy et al., 2014; Measure Evaluation, 2019).

We have assumed, based on experience, that the job of securing the engagement of all necessary role players will fall largely to the senior nursing educator within the School of Nursing. We acknowledge that this task is challenging. We recommend that the lead individual convenes a steering group to support transparency and ownership regarding functional responsibility for creating the supportive conditions that will enable the programme to be sustained. This group should include a suitably senior representative for each of the domains.

Although consultation sought to maximise relevance and suitability for application, the model has not yet been implemented. The model is specific to children's nursing training in southern and eastern Africa. We expect that it could be applied to other nursing and potentially other health professionals specialisms and other geographies with necessary adaptation to local contexts, which stakeholders could carry out following the process we have described.

We intend to work with members of the Children's Nursing Educators Forum and wider stakeholders in southern and eastern Africa to implement the model in at least three countries during 2023. This process will be evaluated and any refinements made, with an up-to-date version of the model and guidance on implementation maintained online through the Open Science Framework at https://osf.io/tegx7/.

5. Conclusions

The steps involved in establishing new children's nursing training programmes must be considered as part of a comprehensive set of processes, practices and behaviours encompassing specialist nursing regulation and nursing education as well as wider human resources for health functions. These systems need to operate hand-in-hand as part of an integrated and strategic response to specialist nursing workforce development.

Lessons Learned

- Using a CMM can help to make the responsibilities of different stakeholders explicit, providing a supportive framework for collaboration and a navigable pathway from inception to full sustainability of new training programmes.
- The model makes visible the range of regulatory and associated processes involved in developing a new educational programme for specialist nurses, including educational standards, quality assurance, scopes of practice, and systems for licensing and registering specialist children's nurses. Stakeholders can use the model as a map to

Domain	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalised	Level 5: Optimised
4. Regulatory system capacity	Regulations for accreditation of new training programmes are not in place or not uniformly applied throughout the country. Required qualifications and competencies for educators are not specified.	Regulations exist in basic forms across the country or new regulations are being piloted in certain settings. Required qualifications and competencies for specialist educators are specified.	Regulatory mechanisms for implementation are comprehensive, including specified broad curriculum outcomes, a professional standard, title protection, a defined scope of practice and/or a job description.	Regulations are comprehensive and responsive to population health needs and stakeholder priorities.	All regulations reflect best practices and align with regional standards or global guidelines.
	There is no register or functioning system for registering specialist children's nurses.	Registration systems can record relevant additional qualifications and answer basic queries (e.g. number of children's nurses on the register, but not in active practice).	Mechanisms and requirements for registration of qualification and periodic renewal of credentials are clear and transparent.	Compliance with requirements for registration is high.	Registration data is used by decision makers for workforce policy and planning.
5. Stakeholder collaboration	Extent of political support for the new programme is unclear. Stakeholders and their functions are not defined.	Political support is confirmed through a clear mandate to proceed with the new programme. An asset-based approach is used to identify and invite local stakeholders required to initiate the programme.	The relationships between stakeholders and their functions are collaboratively agreed upon and formalised through MOAs and/or stakeholder fora.	Relationships between stakeholders and their functions are clearly defined.	Relationships between stakeholders and their functions are characterised by high levels of trust and open communication.
	There is sporadic or no interaction between stakeholders.	Stakeholders have an initial interaction to clarify training objectives in the context of current policy, MoH programmes and local health service needs.	Stakeholders work to clarify alignment of specialist children's nurse training with current policy, MoH programmes and local health service needs.	Stakeholders have regular ongoing interactions to give input on processes/outputs.	There is bi-directional collaboration among stakeholders which enables opportunities for reciprocal learning, shared decision making, and the generation of shared outputs.

Fig. 2. (*continued*).

identify where they are in the process, and establish the resources and actions needed to make further progress.

- Stakeholders wishing to apply the model to assess their state of Capability Maturity should note the intended application, which is that all conditions described in a step need to be met in full before that step can be considered completed.

Declarations

Ethics approval and consent to participate

This project did not involve human subjects or interventions. Ethical approval was not required.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Availability of data and materials

ll relevant data and materials are presented in the manuscript. An up-to-date version of the model and guidance on implementation is maintained online at https://osf.io/tegx7

Funding

The Harry Crossley Children's Nursing Development Unit receives funding and philanthropic support from the Vitol Foundation. The Vitol Foundation provides general programmatic support and had no role in the design of the study and collection, analysis, and interpretation of data.

CRediT authorship contribution statement

Natasha North: Conceptualisation, Methodology, Validation, Writing – original draft. **Minette Coetzee**: Conceptualisation, Methodology, Writing – original draft.

Authors' contributions

MC and NN conceptualised and developed the model. NN produced the first draft of the manuscript and MC revised it for publication.

Acknowledgements

The development process was facilitated by a monitoring and evaluation professional external to the programme, Robin Pocock. We are grateful to all the members of the Children's Nursing Educators Forum for their engagement in this process. We particularly recognise the provision of detailed feedback from: Chabulembwa Chitimbwa, Ireen Chisanga, Priscilla Kalunga, Sibeso Kamwi, Mitchell Lyowah Bulaya and Alice Berrice Chitalu Mwango (School of Paediatrics and Child Health, Arthur Davison Hospital, Zambia); Aaron Banda (Clinton Health Access Initiative, Zambia); Cynthia Spies (Free State University, South Africa); Eric Chisupa (Lusaka Schools of Nursing, Zambia); Yeovonnie Chauraya (National University of Science and Technology, Zimbabwe); Tara Hilton, Angela Leonard and Lee-Ann White (University of Cape Town, South Africa); Seugnette Rossouw (University of Pretoria, South Africa); Pamela Meharry (University of Rwanda, Kigali and Department of Women's, Children's and Family Health Services, University of Illinois, Chicago, USA); and Beatrix Callard (Windhoek Central Hospital, Namibia). Children's nursing education programmes at the University of

Cape Town are offered collaboratively under the governance of the Division of Nursing and Midwifery as the accredited School of Nursing.

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