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https://doi.org/10.17159/sadj.v79i07.18335

Development of a framework for a dental curriculum to align to AfriMEDS Competency Framework through document analysis

SADJ AUGUST 2024, Vol. 79 No.7 P375-380

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INTRODUCTION

In response to the adoption of the AfriMEDS competency framework by the HPCSA, all dental schools in South Africa were required to incorporate and implement these core competencies described in AfriMEDS within the undergraduate curricula. Due to the paucity of literature on how dental schools have implemented the AfriMEDS core competencies framework, an exploration of the latter is invaluable. The aim of the study was to develop an implementation framework to align the undergraduate dental curriculum at a dental school in South Africa to the AfriMEDS competency framework.

Methods

Document analysis was used to develop the implementation framework to align the AfriMEDS competency framework. A two-layered approach was used; first, literature suggesting implementation strategies of CanMEDS assisted with the extraction of themes from the documents selected (best practice). For the second part of this framework development, the document analysis of the selected documents (curriculum mapping, focus group discussions and a systematic review) were conducted.

Results

The following themes/categories emerged from the data: the AfriMEDS core competency framework; institutional framework; dental school/faculty; faculty development; teaching and learning; and curriculum. From these categories a proposed framework was developed that is dynamic and illustrates how processes, faculty development and curriculum impacts and informs teaching, learning and assessment.

Discussion and conclusion

From the results an implementation framework to align the undergraduate curriculum to the AfriMEDS core competency framework (similar to CanMEDS) was developed. This proposed implementation was deemed feasible.

As CanMEDS was developed for specialist training in Canada, the authors suggest a review of these core competencies that would consider the context of South Africa and the specific dental discipline. It might be valuable to consider the decoloniality strategy when considering African dental graduate competencies.

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INTRODUCTION

Background

Globally, competency-based education (CBE) is currently the appropriate and acceptable approach in dental education. Following the definition of the outcomes-based competencies required by a health professional, competency frameworks were developed. Competency-based frameworks offer structural, content- and process-based benefits. Perceived advantages of competency-based medical education (CBME) include increased transparency and accountability to all stakeholders with a shared set of expectations and a common language for education, assessment and regulation.[1] CBME is rapidly being adopted across the globe.[2] Similarly, in South Africa, the Health Professions Council of South Africa (HPCSA) adapted the African Medical Education Directions for Specialists (AfriMEDS) core competency framework from the Canadian Medical Educational Directives for Specialists (CanMEDS) and required all schools in the country to adopt this.[3] Part of the HPCSA accreditation process requires South African dental schools to present evidence of the incorporation of competencies and alignment of the AfriMEDS core competency framework to the undergraduate dental curricula.[4] Unlike CanMEDS, there is no clear implementation guideline or strategy for the AfriMEDS core competency framework. It is therefore advisable that all four dental schools in the country share a common understanding of the implementation of this framework. In doing so, the AfriMEDS core competency framework could offer similar structural, content- and process-based benefits as suggested of competency-based frameworks.

Concerns have been raised and challenges identified regarding the implementation of CBME, and thus caution is

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advised.[1] Addressing the challenges in the implementation of CBME requires a consideration of the implications for the complex systems in which our education programs reside/exist.[1] A multifaceted implementation strategy for CanMEDS included four domains, namely: 1) standards for curriculum, teaching and assessment; 2) faculty development; 3) research and development resources; and 4) outreach.[5] All four of these domains as part of the implementation strategy were essential ingredients in supporting the adoption and dissemination of the CanMEDS initiative.[5] A more comprehensive alignment of the CanMEDS with the practice of specific specialties may address difficulties in implementing the CanMEDS competencies in medical education.[6]

Competencies for dental education

The clinical competency of a dental student cannot be determined by merely referring to the list of courses in the programme. Similarly, the respect and culture of inquiry essential for learning will be difficult to ascertain from a course list. The goal of a CBE model is to ensure students are able to demonstrate their knowledge, skills and values by means of reliable and measurable performance outcomes.[7] Statements of competence and attainment define what students are expected to learn.[8] Dentists are expected to contribute to the achievement of the general health of patients by implementing and promoting appropriate oral health management.[9] The US, Canada and the UK have published official documents on competence.[9] The American Dental Education Association (ADEA) approved the following competencies for the New General Dentist: 1) critical thinking; 2) professionalism; 3) communication and interpersonal skills; 4) health promotion; 5) practice management and informatics; 6) patient care A (assessment, diagnosis and treatment planning); and 7) patient care B (establishment and maintenance of oral health).[7]

In 1994, most Canadian dental programmes adopted a national consensus document specifying competencies for a beginning dental practitioner.[10] This document comprises 47 competency statements. Canadian dental programmes have used these competencies to guide curriculum content and to provide evidence of curriculum outcomes.[10]

The General Assembly of the Association for Dental Education in Europe (ADEE) approved competencies for the European dentist.[9] Seven domains were identified, namely: 1) professionalism; 2) knowledge base; 3) communication and interpersonal skills, information and information literacy; 4) clinical information gathering; 5) diagnosis and treatment planning; 6) therapy: establishing and maintaining oral health; and 7) prevention and health promotion.[9] Within each domain, the following major competencies were identified:[9]

- Professional attitude and behaviour
- Ethics and jurisprudence
- Communication
- Application of basic biological, medical, technical and clinical sciences
- Acquiring and using information
- Obtaining and recording a complete history of the patient's medical, oral, and dental state
- Decision-making, clinical reasoning and judgment
- Establishing and maintaining oral health
- Improving the oral health of individuals, families and groups in the community

It is apparent that there is some overlapping of the agreed or approved competencies globally, with the focus on practicing dentistry. The overlapping is aligned to the discipline and scope of practice of a general dentist. An important driver of the development of norms of competencies was the movement to CBE for dentistry. As highlighted, the development of these competencies was led and managed by global, region and country specific licensing or dental organisations. From the literature, the role of dental academia in the development of the competencies is not evident. If dental schools are responsible for ensuring dental graduates' competence at graduation, the involvement should be essential.

Following the definition of the outcomes-based competencies required from a health professional, competency frameworks were developed. Englander et al[11] defined a competency framework as an organised and structured representation of a set of interrelated and purposeful competencies. A clearly articulated framework of practical real-world objectives provides opportunity for students to develop a clear pathway towards relevant competencies.[12]

AfriMEDS Core Competency Framework

In South Africa, the HPCSA developed specific dental graduate exit outcomes. The AfriMEDS Core Competency Framework was adopted in 2011 with permission from the CanMEDS Physician Competency Framework by the Undergraduate Education and Training Subcommittee (UET) of the Medical and Dental Professions Board (MDB) in collaboration with training institutions and the South African Committee of Medical and Dental Deans.[3] The reason for this adoption and supplementary modification was to align the framework within the South African and wider African context, and to be sufficiently generic to guide the training of all undergraduate health professionals. It can be suggested that the HPCSA intended to "deconstruct" CanMEDS with the purpose of being contextually responsive and relevant. While CanMEDS was originally developed for postgraduate medical training, and globally most medical curricula adopted this, AfriMEDS aimed to be inclusive of all health professions with specific changes to the roles.[13]

There are differences between the CanMEDS and AfriMEDS frameworks. In CanMEDS, the central role is coined as the candidate becoming an "Expert", while in the AfriMEDS context, the candidate becomes a "Healthcare Practitioner". The role of "Manager" in CanMEDS is expanded to include "Leader and Manager" in the AfriMEDS framework. It appears that the deconstruction of the roles "Expert" and "Manager" seemed to destabilise power-relations. Decolonisation acknowledges the inherent power relations in the production and dissemination of knowledge, and seeks to destabilise these, allowing new forms of knowledge which represent marginalised groups.[13] The principles followed within the key competencies and enabling competencies of a "Healthcare Practitioner" and "Leader and Manager" are comparable to the CanMEDS principles. The AfriMEDS (Figure 1) framework guides the accreditation process of all medical and dental schools in South Africa.[3]

Biomedical theories of disease and treatment; concepts such as competencies, evidence-based medicine and acceptable professional activities; culturally mediated

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notions such as professionalism, communication skills and doctor-patient relationships; and even reflection, are often imposed on learners in or from the Global South.[14] When reflecting on the roles "Communicator" and "Professional" through a decolonial lens, the deconstructing of these roles is necessary.

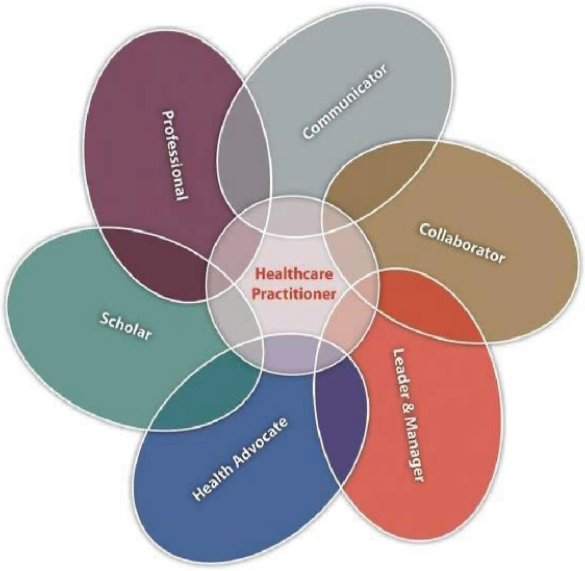

Figure 1: AfriMEDS[15]
(*Adapted from the CanMEDS Physician Competency Framework, with permission of the Royal College of Physicians and Surgeons of Canada).

Of particular interest is that globally the CanMEDS core competency framework guides specialist and medical curricula. In contrast to this, the AfriMEDS core competency framework guides all medical and dental curricula in South Africa. Worldwide dental schools are underpinned by approved competencies or competency statements developed for specific contexts or countries, as referred to previously. As AfriMEDS was adopted from CanMEDS, concerns noted around the "artificial" division of roles as well as the implementation of the CanMEDS framework would need to be evaluated.

CanMEDS core competency framework implementation strategies and challenges

There was agreement that the CanMEDS roles are relevant to clinical practice. However, there were also reports of educators and doctors struggling to implement the roles in the daily practice of specific specialties.[6] A multifaceted implementation strategy for the CanMEDS included four domains, namely: 1) standards for curriculum, teaching and assessment; 2) faculty development; 3) research and development resources; and 4) outreach.[5] All of these domains as part of the implementation strategy were essential for supporting the adoption and dissemination of the CanMEDS initiative.[5]

Outcome frameworks such as CanMEDS specify the destination but not the mode of delivery. In addition, no clear guidance on a specific teaching strategy is given for CBME.[12] When translating these competencies to a specific postgraduate course, a tendency to specify these competencies even further will arise. Due to the complexities of the CBE assessment model, some clinicians are challenged.[16]

One of the barriers to implementation has been the lack of a common language describing domains of competence in the health professions and the specific competencies that are critical to the formation and continuous development of physicians.[11] As long as the competency statements are articulated at an appropriate level of generality at an undergraduate level, they can not only be adapted to the different phases of the undergraduate programme but will also be able to accommodate the integration of emerging topics and content.[12]

The adoption of a competency-based approach implies the need for faculty development in the principles and practice of criterion-based assessment (CBA). CBA is not unique to CBE, but it is integral to the notion of a competency framework.[12] Understanding, execution and interpretation of these assessments demands educational and psychometric expertise.[16] Chou et al[17] concluded that substantial faculty development may be needed to gain proficiency for the evaluation of the "non-medical expert roles" in the CanMEDS competency framework. Difficulties in implementing the CanMEDS competencies in medical education may be addressed by a more comprehensive alignment of the framework with the practice of specific specialties. Such an alignment would require the mapping of specialty-specific competencies and ascertaining their match with the CanMEDS framework.[6] This improvement of specialty specificity of a programme would enable translation of curriculum outcomes and clinical practice.[6] Teachers working within a competency-based programme are faced with the increased complexity of not only delivering the "content" of their discipline but also translating the principles of the competency framework into concrete learning tasks.[12]

An overarching outcome framework allows a consistent approach to these challenges highlighted and the alignment of educational activities and objectives through the continuum of medical education.[12] Porter[18] suggested three tools for measuring content and alignment of a curriculum, viz: (1) teacher surveys on instructional content; (2) content analysis of instructional material; and (3) alignment indices to describe the degree of overlap between content and standards or assessment. Teacher surveys on competencies within the curriculum, as well as perceived required competencies, is thus an acceptable source of information.[6] Hence, the inclusion of knowledge and views of dental educators of the AfriMEDS core competency framework would be able to provide information on the curriculum alignment and competencies required by the dental graduate in the South African context.

AfriMEDS core competency framework in dental education

In response to the adoption of the AfriMEDS competency framework by the HPCSA, all dental schools in South Africa were required to incorporate and implement these core competencies described in AfriMEDS within the undergraduate curricula. Each of the four dental schools in South Africa have autonomy with regard to the core competencies implementation strategies within their undergraduate dental curriculum. Each of the dental schools is required to describe the implementation and translation of these AfriMEDS core competencies in their curriculum through the completion of the self-evaluation questionnaire as part of the accreditation process.

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The core competencies were not clearly or consistently described in the curriculum and the implementation thereof was not evident. Evidence from previous accreditation reports suggests the translation of the AfriMEDS core competencies throughout the undergraduate dental curriculum were not explicitly described. Frank and Danoff[5] suggested that the implementation of CanMEDS required a multifaceted approach, including standards, faculty development, research and development, and outreach. Due to the paucity of literature on how dental schools have implemented the AfriMEDS core competencies framework, an exploration of the latter is invaluable. To this end, the aim of the study was to develop an implementation framework to align the undergraduate dental curriculum at a dental school in South Africa to the AfriMEDS core competency framework.

MATERIALS AND METHODS

Document analysis was used to develop the implementation model to align the AfriMEDS competency framework. Document analysis is the systematic procedure of finding, selecting, reviewing and interpreting documents to uncover meaning and discover insights that are relevant to the research problem.[19] Document analysis yields data – excerpts, quotations or entire passages – which are then organised into major themes, categories and case examples specifically through content analysis.[20] The information from the curriculum mapping process, transcripts from the Focus Group Discussions (FGDs) and data extracted from the Systematic Review (SR) were included as data sources for the document analysis for this study. As a research method, document analysis is particularly applicable to qualitative case studies, ie intensive studies producing rich descriptions of a single phenomenon, event, organisation or programme.[20]

DATA COLLECTION PROCESS AND FRAMEWORK DEVELOPMENT

The process of document analysis involves skimming (superficial examination), reading (thorough examination) and interpretation. This iterative process combines elements of content analysis and thematic analysis.[20]

A two-layered approach was used to develop a framework to align and implement the AfriMEDS core competency framework. First, literature suggesting implementation strategies of CanMEDS[5] assisted with the extraction of themes from the documents selected (best practice), as illustrated in Figure 2. Standards for curriculum, teaching and assessment, faculty development, research and development, and outreach were suggested approaches for implementation of the CanMEDS competency framework.[5] For the second part of this framework development, document analysis was conducted. Document analysis included results from previous studies conducted, namely information from a curriculum mapping,[4] FGD[21] and SR.[21] As the subjective interpreter of the data contained in the documents, the researcher should make the process of analysis as rigorous and as transparent as possible.[20] Following the analysis themes were developed, as illustrated in Table 1 further below.

RESULTS

The following themes/categories emerged from the data: The AfriMEDS core competency framework; institutional framework; dental school/faculty; faculty development; teaching and learning; and curriculum. Table 1 illustrates how the categories aligned with the results, discussion and conclusion of each document source.

THEMES THAT EMERGED FROM THE DOCUMENT ANALYSIS

AfriMEDS core competency framework

From the previously discussed literature, external pressures from the HPCSA created a thrust for change to CBE. In addition, the HPCSA adopted the AfriMEDS core competency framework to provide guidance for the transition to CBE. As the AfriMEDS competency framework

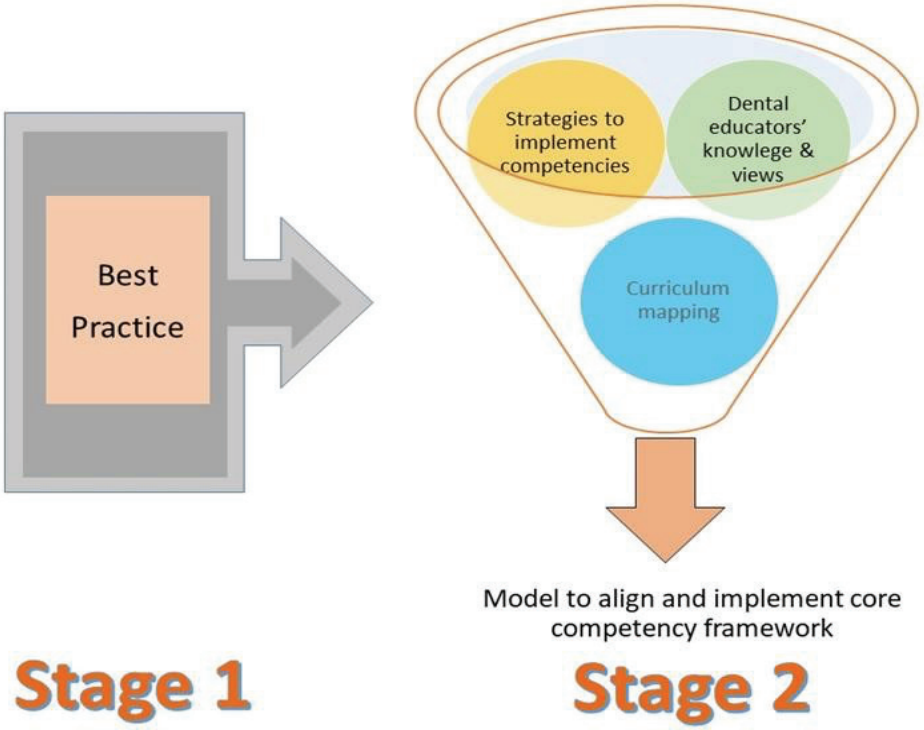

Figure 2: Development of the model to align and implement the core competency framework.

https://doi.org/10.17159/sadj.v79i07.18335

Table 1: Documents selected, analysed and emerged themes

Documents selected	Data analysed	Themes
Curriculum mapping	AfriMEDS core and enabling competencies Undergraduate dental curriculum Undergraduate dental curriculum map	-AfriMEDS competency framework -Curriculum -Core competencies
Focus Group Discussion (FGD)	FGD transcriptions Results and conclusions	-Institutional operation plans (including graduate attributes) -Competencies -Competency framework - Curriculum -Teaching strategies and assessments
Systematic Review (SR)	Articles selected for SR Results and Conclusion of SR	-Leadership support (for curriculum changes) -Faculty development (related to teaching and assessment)

underpins the undergraduate dental curriculum, it needs to be included in the proposed framework for alignment and implementation of the AfriMEDS.

Institutional framework

Dental schools operate within a larger institutional landscape that also requires alignment to institutional specific frameworks. In the case of the University of the Western Cape (UWC), graduate attributes situated within the Institutional Operating Plan (IOP) and decolonisation of the curriculum, etc are external pressures that inform the undergraduate dental curriculum. For this reason, incorporation and alignment of the specific institutional framework is necessary in the dental curriculum.

Dental school/faculty

In response to external pressures, the leadership of the dental faculty needs to support this transition to CBE. For this, appropriate structures or committees are necessary vehicles to support and drive this change process. Support includes human resources, finances, policies and procedures that will govern the change process.

Faculty development

Faculty development related to CBE, as well as teaching, learning and assessment, is essential for dental educators as stakeholders in this successful transition to CBE. This agrees with Frank and Danoff[5] who suggested faculty development as one of the implementation strategies for the CanMEDS core competency framework. From the results of the FGDs with the dental educators, it emerged that dental educators were not completely familiar with AfriMEDS, although they were able to identify most competencies related to AfriMEDS. Faculty development for AfriMEDS, curriculum development, accreditation processes, teaching, learning and assessment would be valuable to ensure the successful implementation of AfriMEDS.[21]

Teaching and learning

In addition, the results from the FGDs suggest the usefulness of dental educators' views on competencies, with a further recommendation given for dental graduates' competencies to be reviewed frequently.[21] Teaching and learning also forms part of Frank and Danoff's[5] multifaceted implementation strategy. Results from the SR highlighted various teaching strategies to incorporate the required core competencies. Teaching and assessment should also be aligned and appropriate to CBE. Dental educators from the FGD were more concerned with the teaching and assessment of the core competencies than discussing the competencies.[21]

Curriculum

Curriculum is the final part of the implementation strategy. With transitioning to CBE learning outcomes, teaching strategies and assessment should be aligned. As CBE focuses on outcomes, learner-centredness and abilities, it influences curriculum design.[22] Curriculum mapping is a valuable tool to evaluate the alignment of AfriMEDS, and highlights any overlapping or gaps in an undergraduate curriculum.[21] Curriculum mapping has the potential to display the entire curriculum so that dental educators, leadership and external stakeholders such as the HPCSA would be able to view alignment to the AfriMEDS core competency framework.[21] This process will inform curriculum development.

DISCUSSION

Figure 3 diagrammatically represents the proposed AfriMEDS core competency framework implementation model. This framework is dynamic and illustrates how processes, faculty development and curriculum impacts and informs teaching, learning and assessment.

The aim of this study was to develop a framework to align and implement the AfriMEDS core competency framework into an undergraduate dental curriculum. Inclusion of the literature and results from the curriculum mapping, FGD and SR guided the document analysis process to develop the implementation framework (Figure 3) of the AfriMEDS core competency framework. In addition to being dynamic, the proposed model allows the institutional framework of the individual dental schools to impact the dental curriculum where relevant. Due to the urgency of the decolonisation of the curriculum in this institution in South Africa, this strategy needs to be considered in the implementation of the competency framework. In addition, this proposed framework allows seamless integration of the AfriMEDS core competency framework into the undergraduate dental curriculum. The implementation of this framework needs to be underpinned by a common understanding of the AfriMEDS core competency framework by all stakeholders (dental educators, programme directors and dental experts involved in accreditation processes).

An appropriate framework for aligning the AfriMEDS core competency framework was developed. However, the urgency of decoloniality within health professions education and the researchers' reflections added new dimensions to this research. In the first study that explored the setting of research priorities for health professions education in sub-Saharan Africa (SSA), one of the priorities was to

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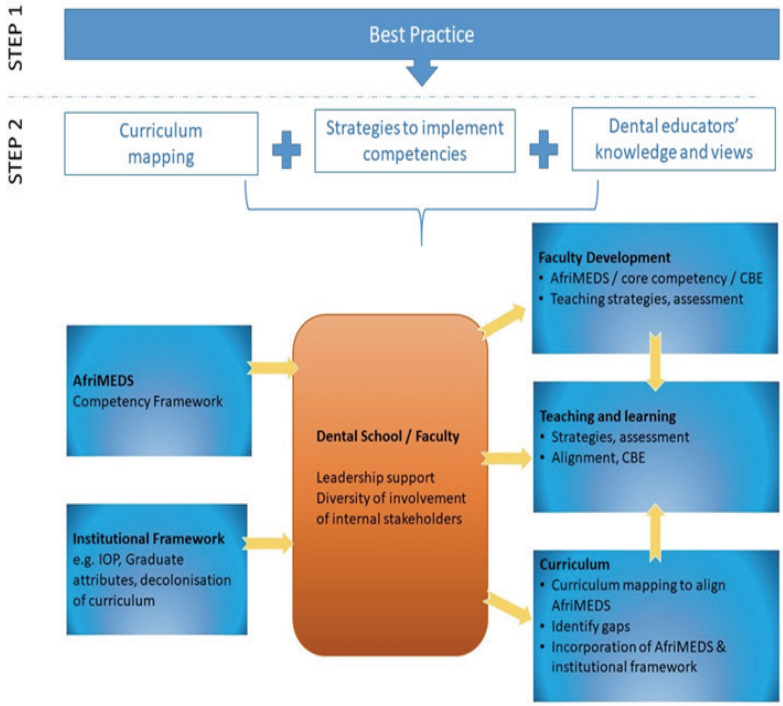

Figure 3: AfriMEDS core competency implementation framework.

determine how to develop and implement curricula that are responsive to the health needs of SSA.[23] In South Africa there are many factors that may impact an undergraduate dental curriculum. As the curriculum (that includes competencies) influences dental schools and the overall implementation of the AfriMEDS core competency framework, it is recommended that the burden of oral health disease, access to oral health care and the higher education landscape be considered when the competencies of dental graduates are reviewed. There appeared to be very little consideration given to oral health in the South African context and its impact on the core competency required for dental graduates in the published literature. Given that oral health is not set as a health priority in South Africa contributes to the complexity of the development and adoption of the AfriMEDS core competency framework for medical and dental schools. In addition, this review of competencies will ensure that the dental graduates are fit for practice in the 21st century. It is important that the dental curriculum is contextually responsive so that dental graduates are trained to be contextually and globally relevant.

CONCLUSION

A dynamic implementation framework was developed to align and implement AfriMEDS core competency framework to an undergraduate dental curriculum. Results from a Delphi follow-up study concluded that this framework was feasible to consider.[24] However, as AfriMEDS core competency framework (similar to CanMEDS) was developed for specialist training, a review of the generic "translation" of these core competencies to dental schools and curricula is suggested. It might be valuable to consider the decoloniality strategy when considering African dental graduate competencies. A decolonial strategy in health would reveal the cultural differences in the health care of "peoples with knowledge and ways of life that do not fit into the Western standard".[14] With this in mind, we should explore whether the adoption of the AfriMEDS from CanMEDS core competency framework is appropriate in the African context.

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