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A Framework for a Competency Based Medical Curriculum in Saudi Arabia

Waleed Hamad Al Bu Ali¹, Magdy Hassan Balaha², Feroze Kaliyadan³, Mohamed Bahgat⁴, Elsayed Aboulmagd⁵

Department of Pediatrics, College of medicine, King Faisal University, Al Ahsa, Saudi Arabia¹

College of medicine, King Faisal University, Al Ahsa, Saudi Arabia²

Department of Dermatology/Internal medicine, College of medicine, King Faisal University, Al Ahsa, Saudi Arabia³

Department of Anatomy, College of medicine, King Faisal University, Al Ahsa, Saudi Arabia⁴

Department of Microbiology, College of medicine, King Faisal University, Al Ahsa, Saudi Arabia⁵

Corresponding author: Feroze Kaliyadan, MD. Dept of Dermatology/Internal medicine, Educationalist GMCA 2012, College of medicine, King Faisal University, Al Ahsa, Saudi Arabia -61982. Phone/fax: +966544710168. E-mail : ferozkal@hotmail.com

ABSTRACT

Background: We recently adopted a competency based curriculum based on the CanMEDs model. This shift required the cross-mapping of all key CanMEDs competencies with the competencies for higher education in Saudi Arabia as per the Saudi National Commission for Academic Accreditation & Assessment (NCAAA) guidelines. **Objectives:** To formulate competencies for our curriculum and to create a framework aligned with NCAAA, CanMEDs and Saudi Meds. **Methods:** After finalization of program outcomes, the program goals were cross-mapped with CanMEDs and Saudi Meds competencies and then the CanMEDs competencies were reverse mapped with our outcomes. Finally benchmarking of outcomes with the programs of the Universities of Manitoba and Toronto was done. **Results:** We were able to cross-map and match major outcomes of our program with both the CanMEDs and the Saudi Meds frameworks, ensuring that the outcomes are in line with NCAAA, CanMEDs and Saud Meds. Also, our program objectives were bench marked with two of the Canadian medical schools. **Conclusion:** We propose that our framework can be a model for other universities in Saudi Arabia to consider when shifting to a competency based curriculum.

Key words: Competency based curriculum, CanMEDs, Saudi MEDs, Cross-mapping competencies.

1. INTRODUCTION

Our College of Medicine under the King Faisal University, Hofuf, Saudi Arabia, has recently adopted a competency based, problem-based curriculum from the University of Groningen, Netherlands, which in turn has based its basic framework on the CanMEDs model. The shift from the traditional teaching model to the new competency based model required the cross-mapping of all key CanMEDs competencies with the competencies for higher education in Saudi Arabia as per the National Commission for Academic Accreditation & Assessment (NCAAA) guidelines (1). This is essential as per the regulations regarding higher education in the Kingdom of Saudi Arabia (KSA).

The last few years have seen an effort to create a uniform competency and outcome pattern for undergraduate medical education in Saudi Arabia. Two recent key events for this were

The draft on "Learning outcomes for bachelor degree programs in medicine" developed by the NCAAA in 2010 (1).

The national competency framework – Saudi Meds, developed as a joint effort by five medical schools in KSA (2).

A meeting of deans of Saudi medical colleges held in November 2012 gave final endorsement for the Saudi Meds as a pre requisite for all new medical colleges to frame their curricula. It was

decided in this meeting that Saudi Meds will henceforth be the primary tool to cross map all medical curricula in Saudi Arabia.

Our college started in 2001 with its traditional discipline based Flexnerian curriculum. The College started the process of updating its curriculum since the graduation of the first batch in 2007. Apart from the improvement in the educational methodology and reforming of educational environment for the traditional curriculum, the college started to search for a newer curriculum that would cover all the recent challenges. The college studied all the relevant innovative curriculum modification trials in Saudi Arabia (e.g.: Al Qassim University, Al Imam University and King Saud bin Abdul Aziz University). The college also studied the Arabian Gulf University (Bahrain) Curriculum. After that the college did a further needs assessment and explored various international curricula. After deliberations and discussions, the college endorsed the medical curriculum of the University of Groningen, Netherlands to be its adopted curriculum. A long term plan of cooperation was accepted and the adopted curriculum took the name "Groningen Medical Curriculum Adoption 2012" or GMCA 2012, and started the first batch in September 2012. Our initial challenge was to ensure that we create a competency framework which is well

aligned with NCAAA, CanMEDs and the Saudi meds framework. This manuscript attempts to correlate the competencies under the NCAAA, CANMEDS, Saudi Meds and GMCA 2012. We hope that our work will act as a model for many other Saudi medical schools which are in the process of shifting from a traditional curriculum to a competency based curriculum.

2. METHOD

Settings:

This activity was conducted at Al Ahsa Medical College, King Faisal University, Saudi Arabia. At the very outset it was clear that the broad competencies of our curriculum would be aligned with the CanMEDs competencies as the curriculum of the University of Groningen is modified based on the CanMEDs framework. After a detailed literature review and review of competency frameworks of other educational bodies and universities, a rough draft was prepared as per the NCAAA format. This was further refined during the period of March-September 2012. The entire process was carried out meticulously by senior faculty under the guidance of the dean of the college of medicine and with support from the higher university administration.

The process:

During an international conference of medical education held at Riyadh 2012 (SIMEC 2012), a lot of themes of innovative curricula were discussed and a lot of workshops were implemented. One of these workshops was cross-mapping of ACGME competencies into medical curricula. Two College members attended this workshop to have a better understanding of the cross-mapping procedure. The session on cross-mapping focused mainly on the ACGME competencies with stress on the following points: Understanding the ACGME 6 competencies in an international context, applying a process for integrating these competencies at the undergraduate level, selecting appropriate measurement methods for assessing two of the six competencies and applying the concepts in their own settings. The experience gained from this session was very useful in formulating our competencies and cross-mapping with other frameworks.

Opinions were also taken from other internal as well as external experts. The main frameworks studied included the CanMEDs framework (3) ACMGE (Accreditation Council for Graduate Medical Education), USA, 2001 (4), General medical council 2009 (5), Saudi Meds (2), the framework for undergraduate medical education in Netherlands (2009) (6), AAMC (Association of American Medical Colleges (1998) (7) and the competency frameworks used by the universities of British Columbia, Manitoba and Toronto (8, 9, 10).

Instruments

CanMEDs competency framework was tabulated as a standard sheet for comparison NCAAA guidelines of writing the program specifications were utilized RUG-G2010 'attainment of competencies' document was explored to use its methodology

A master table was prepared by the authors where comparison and cross mapping was done using the previously

CM	Program Goals
Medical Expert (ME)	1. Grasp core medical knowledge and foundations of medicine and apply that knowledge to the practice of medicine at the level of an individual patient and population at large.
	2. Demonstrate clinical reasoning and analytical skills in discussing the patient's complaints, presenting the different possible solutions and therapies while considering the different medical, social, psychological and cultural backgrounds.
	3. Collect, interpret, document and communicate a complete and a focused medical history, as appropriate.
	4. Integrate and communicate the historical, physical, and investigative findings into a meaningful differential diagnosis formulation, including identifying the most probable diagnosis in a patient.
	5. Demonstrate effective therapeutic and ongoing management of an individual patient and population at large besides drafting of diagnosis and/or treatment plans with description of the different therapeutic modalities.
	6. Collect, interpret, document, and communicate a complete and focused physical examination including mental status examination where appropriate.
	7. Perform the basic medical skills and procedures. Perform a range of simple surgical and pharmacological therapies related to the different disciplines, including first aid and general management in both routine cases and emergencies.
Communicator (COM)	1. Employ skills for communicating information, negotiating, and taking charge; considering different types of human behavior under different somatic, psychological and social conditions.
	2. Elicit relevant information and perspectives from patients and their supporters, relatives, colleagues, and other professionals. The elicited information should consider current physical and psychological problems, prior medical, psychological and social circumstances.
	3. Acknowledge the different theoretical and applied backgrounds and roles needed for sound doctor-patient communication and accurately convey relevant information and explanations to patients and their relatives.
	4. Develop and tailor the suitable plan of care for different patient problems in a shared view with patients, relatives and peers.
	5. Effectively convey oral and written information associated with a medical encounter.
	6. Communicate effectively with third parties, other than health professionals.
	7. Keep confidentiality, privacy and appropriately develop and maintain ethical supportive relationships, rapport and trust with patients and their relatives.
Collaborator (COL)	1. Integrate knowledge of one's own role with knowledge about the roles of generalist and specialist physicians, and other health professionals in order to appropriately establish and achieve patient and/or patient supporter goals (Role Clarification).
	2. Describe effectively and appropriately apply the principles of team work dynamics and leadership processes to enable and support effective health professional collaboration (Team Functioning and leadership)
	3. Communicate with colleagues, physicians, and other health professionals in a collaborative, responsive and responsible manner (Inter- and Intra-professional Communication).
	4. Actively engage self and others, including the patient/patient supporters, and health care professionals, in preventing, negotiating and resolving inter- and intra-professional conflict (Conflict Resolution).
	5. Seek out, integrate, and value, as a partner, the input and the engagement of all team members, including the patient/patient supporters/health care professionals/community, in designing and implementing health care delivery (Patient/Patient Supporter-Centered Care).

Manager (MGR)	<ol style="list-style-type: none"> 1. Explain the structure and function of the Saudi health care system and the types of health care delivery provided to the population. 2. Adequately organize their-own tasks within the frame of health care with effective allocation of finite health care resources. 3. Participate in systemic quality process evaluation and improvement, including patient safety initiatives. 4. Employ information and communication technologies to manage self-directed learning and collaborative knowledge exchange. 5. Maintain a healthy work leadership and administrative skills with stress on life balance skills and time management skills in academic and clinical settings.
Health Advocate (ADV)	<ol style="list-style-type: none"> 1. Foster the health needs of Saudi society and of an individual patient in the context of medical performance and dealing with the conflict that is inherent between advocate and manager roles. 2. Outline the extent and identify the determinants of health and participate in activities that improve the health of the Saudi community or vulnerable populations in Saudi Arabia based on the Medical Oath and Islamic ethical codes in Saudi Arabia. 3. Demonstrate proficiency in health education to patients and specific populations; for both promotion and prevention strategies. 4. Maintain personal health and well-being such that the health care that one provides is sustainable.
Scholar (SCH)	<ol style="list-style-type: none"> 1. Apply the steps needed in the process of Evidence-Based Medicine (EBM) utilization learning and patient care. 2. Discuss the ethical principles of experimental, clinical and translational research. 3. Develop and implement a plan for continual personal learning. 4. Utilize IT (Information technology) skills in his scholarly activities with ability to facilitate the learning of others as part of professional responsibility (patients, health professionals, society). 5. Design, share and implement some steps in small-scale qualitative, practical or clinical scientific research project.
Professional (PRF)	<ol style="list-style-type: none"> 1. Explain behavioral adjustments in order to promote his medical expertise and self-development. 2. Demonstrate accountability to the medical profession and other health professionals. 3. Frame a functioning professional dialogue with a patient, even when the patient rejects the indicated diagnostics or treatment. 4. Appropriately comply with the ethical and legal aspects in dealing with the patient medical problems. 5. Recognize and describe the reflection methodology and demonstrate transparent and efficient reflective attitude in both academic and clinical situations.

Table 1. Key Competencies in our program (Program Goals) per each major CanMEDs Competency (CM)

mentioned items after formulation of our program goals and objectives. The manuscript was revised meticulously to cover all the domains and sub-domains in different aspects of medical graduate guidelines.

For the cross-mapping and competency benchmarking the following steps were done.

Finalization of our program goals and outcomes. These were divided into 7 broad roles as per the CanMEDs framework – Medical expert, Communicator, Collaborator, Manager, Health advocate, Scholar and Professional. The program goals and outcomes under each of these seven broad roles were classified based on the NCAAA format based on three broad domains – Cognitive [knowledge(KN)and understanding (CG)], affective [including attitude, communication (CM) and interpersonal skills(IN)] and psychomotor domains (PS)

Program goals were cross-mapped with CanMEDs and University of British Columbia (exit competency matching with

program outcomes, UBC 2011) key competencies and program outcomes were cross-mapped with CanMEDs enabling competencies and Saudi Meds competencies and then the CanMEDs competencies were reverse mapped with our program outcomes. This was further followed by benchmarking of our program outcomes with two other Canadian Universities, namely the universities of Manitoba (Christodolou 2012) and Toronto (Faculty of medicine, university of Toronto 2011/2012). This was part of the requirement for national and international accreditation.

3. RESULTS

Table 1 shows the detailed mapping of Key Competencies (Program Goals) in our medical program GMCA 2012 under each major CanMEDs Competency; Medical expert (ME), Communicator (COM), Collaborator (COL), Manager (MGR), Health Advocate (ADV), Scholar (SCH) and Professional (PRF).

Table 2 shows the cross-mapping of our curriculum goals and outcomes under seven broad roles (in the NCAAA format, in three domains) to the CanMEDs key and enabling competencies and the UBC exit competencies.

We were able to cross-map and match most major outcomes of our program with both the CanMEDs and the Saudi Meds frameworks, ensuring that our program outcomes are in line with NCAAA, CanMEDs and the NCAAA frameworks.

4. DISCUSSION

Standardization of medical education frameworks is essential in this age of globalization. Like in many countries over the world Saudi Arabia is also in the process of developing a standard framework for medical education. Many countries across the globe have adopted the CanMEDs framework with or without modifications. The curriculum we have adopted from the University of Groningen has also based its competencies on the CanMEDs model with some modification (6, 11). In Saudi Arabia however, as per present regulations, the program outcomes and competencies have to be expressed in terms of the NCAAA pattern. Hence we wanted to ensure that our curriculum is compatible with both the NCAAA and the CanMEDS framework. In the process we also attempted to compare and match our outcomes with another proposed framework for medical education developed in Saudi Arabia, namely the Saudi Meds framework. To the best knowledge of the authors, this is the first publication in Saudi Arabia and in the Arabian Gulf region showing the medical curriculum competencies mapped against CanMEDS, Saudi Meds and NCAAA competencies.

Most major educational bodies have formulated competency frameworks for medical education. These include the CanMEDs framework (3), ACMGE 2001(4), General medical council 2009 (5), Saudi Meds (2), the framework for undergraduate medical education in Netherlands (2009) (6) and the AAMC (1998) (7).

The CanMEDs framework (3) has seven broad roles, namely -medical expert, communicator, collaborator, manager, health advocate, scholar and professional. Each role has further key

		Mapping with	
		CanMEDs Key Competencies ³	UBC Key Competencies ⁷
Medical Expert (ME)	ME1	2	1
	ME2	3	4,5
Communicator (COM)	ME3	3	2
	ME4	6	5
	ME5	4	6
	ME6	3	3
	ME7	5	-
	COM1	11	5
	COM2	8	2
	COM3	11	3
	COM4	10	4
	COM5	9	5
	COM6	11	6
	COM7	7	1
Collaborator (COL)	COL1		1
	COL2		2,3
	COL3	12	4
	COL4	13	5
	COL5	12	6
Manager (MGR)	MGR1	14	1
	MGR2	16	2
	MGR3	16	3
	MGR4	15	6
	MGR5	17	4,5
Health Advocate (ADV)	ADV1	18,21	1
	ADV2	20	2
	ADV3	19	3
	ADV4	21	4
Scholar (SCH)	SCH1	22,23	1
	SCH2	25	2
	SCH3	22	3
	SCH4	24	4
	SCH5	25	-
Professional (PRF)	PRF1		2
	PRF2	28	2
	PRF3	26	1
	PRF4		1
	PRF5		-

Table 2. Key Competencies (Program Goals) under each major CanMEDs Competency mapped against CanMEDs and UBC Key Competencies

and enabling competencies – a total of 28 key and 126 enabling competencies. ACMGE (4) defined six main competencies for a medical graduate – Patient care, medical knowledge, practice-based learning, and improvement, interpersonal and communication skills, professionalism and systems-based practice. All these broad areas are further divided into 28 outcomes. The General Medical Council (5) defines three major competencies for a medical graduate – doctor as a scholar and scientist, doctor as a practitioner and doctor as a professional. A further 16 competencies and 106 detailed objectives are derived from these three broad roles. The Saudi Meds (2) provides a framework that reflects the principles of professional medical practice in Saudi Arabia. This has culminated from a long standing national need to define the competencies of medical graduates in Saudi

Arabia and in the Arabian Gulf area in general (12, 13). This includes the general competencies expected of medical graduates and the essential learning outcomes for undergraduate medical education. Saudi Meds was not meant to be a unified national curriculum, just a framework on which individual universities can work thereby guaranteeing equivalent standards without compromising on autonomy. Saudi Meds covers seven broad domains centered on ‘Patient care and social accountability’. The seven broad domains include – ‘Approach to daily Practice’, ‘Dr and patient’, ‘Dr and community’, ‘communication skills’, ‘professionalism’, ‘Dr and information technology’ and ‘Dr and research’. The finalization of these broad domains was the main agenda of the first phase of the project and further phases will cover defining specific outcomes and competencies in each domain and development of a structured program to ensure that the graduates achieve the specified outcomes by the end of their internship.

It was observed that the CanMEDs competencies were originally destined for postgraduate medical specialties and that there was less consideration given to the basics of medical foundation skills and knowledge in the CanMEDs framework. Internationally recognized medical schools in Canada therefore modified these frameworks for undergraduate programs by adding more foundational knowledge and skills in their curricula as an adaptive addition to the CanMEDs model. We attempted to do the same for our curriculum. We adapted a lot of the information from RUG medical curriculum objectives while given due consideration to the Saudi Meds framework and NCAAA guidelines.

We chose three universities for benchmarking our program outcomes – namely, the universities of British Columbia, Toronto and Manitoba (8, 9, 10). The universities of Toronto and Manitoba had adapted CanMEDs competencies to be more applicable at the level of a medical graduate level rather than a medical post-graduate level. They especially stressed on including more foundation skills in all the roles. Similar the University of British Columbia has also adapted the basic CanMEDs framework to develop a detailed list of ‘exit outcomes’, which are more in line with our requirement as per the NCAAA stipulations.

While most frameworks have similar broad roles, the specific outcomes and competencies tend to differ. It is also obvious that to completely match competencies across frameworks is virtually impossible, especially considering the fact that local cultural contexts need to be given due importance while formulating these outcomes and competencies. The new curriculum we are adopting is from a Dutch university which has its competencies based on the CanMEDs frameworks with modification as per the Dutch undergraduate medical education framework. Since the broad roles of the CanMEDs framework suited our needs we decided to broadly formulate our competency framework on the broad roles of the CanMEDs framework – namely medical expert, communicator, collaborator, manager, health advocate, scholar and professional. However in the enabling competencies we felt that modifications were required as per the NCAAA stipulations. We considered this and the cultural contexts and other requirements unique to Saudi Arabia to write the program outcomes under each broad CanMEDs role falling into the three broad domains namely–Cognitive (knowledge and understanding), affective (including attitude, communication

and interpersonal skills) and psychomotor domains.

Like the Saudi Meds framework our outcomes also meet the main criteria for a competency framework as described by Harden (14). The competencies describe the competencies of a doctor in general and also take into account the local cultural context of Saudi Arabia. It also provides an integrated picture and is relatively simple and clear.

5. CONCLUSION

After the cross-mapping process we found that we were able to establish that our program outcomes were in line with NCAAA, CanMEDs and the Saudi Meds frameworks. We propose that our framework can be a model for other universities in Saudi Arabia to consider when shifting from a traditional to a competency based curriculum.

We added more objectives to cover the foundational medical knowledge and skills in the domain of medical expert competency, and this was cross-mapped with the Saudi Meds, NCAAA and was bench marked against Toronto and Manitoba Canadian schools of Medicine.

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