

Republic of Yemen
Ministry of Higher Education & Scientific Research



Council for Accreditation & Quality Assurance

National Academic Reference Standards (NARS)

Undergraduate Medical Education Programs

May 2018

First Edition



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PREFACE

The Council for Accreditation and Quality Assurance in Higher Education (CAQAY) is pleased to introduce this document that contains the National Academic Reference Standards for medical education. In the light of its mission and general policy for developing National Academic Reference Standards (NARS) for higher education, the Council intends to present this document with a view to provide higher education institutions with reference points in the design, delivery and review of their academic programs. It also aims at providing these institutions with a general guidance for articulating the key attributes of tomorrow's medical education graduates, and learning outcomes associated with the programs. By these National Academic Reference Standards stated in this document, the Council hopes to solve the problems that higher education institutions face during the process of programs' review or development by bridging the gap that usually arises as a result of the general absence of national academic reference standards. Hence, there is a genuine need for National Academic Reference Standards for Medical education programs.

In this changing world of globalization and digitalization, faculties of medicine have to produce graduates who are relevant in the 21st Century that is marked by rapid development in technology, knowledge explosion, borderless economic and business operations and many other complex problems of the new millennium. Therefore, the graduate attributes presented in this document and the learning outcomes derived from them as well as teaching and assessment methods provide faculties of medicine's deans, department chairs and faculty members with a frame of reference for reviewing their curriculum. If the design, content, and implementation of faculties of medicine curricula are guided by the set of graduate attributes and learning outcomes presented in this document, these faculties will certainly produce well-prepared, self-motivated and responsible physicians who can assume their expected professional duties in solving the community problems and facing healthcare challenges of the 21st century.

The Council recognizes that faculties of medicine have to respond to the unprecedented changes in the methods of medical education. We hope that faculties of medicine will respond to the intent of this document with some sense of urgency. Faculties of medicine should consider establishing formal processes for using those attributes and learning outcomes to guide reviews of their curricula and program specifications. This should also be accompanied by gradual but significant changes in the way faculties of medicine teach and assess their students. This aspect of medical education entails a special focus from the deans and department chairs in order to make sound improvements in medical education in our country.

Prof. Abdullateef Haidar,

CAQAY Chairperson

Sana'a, 9 May 2018

NATIONAL ACADEMIC REFERENCE STANDARDS (NARS)

National Academic Reference Standards (NARS) are the expected minimum requirements of knowledge and skills necessary to fulfill the requirements of an academic degree.

NARS aim at providing a minimum level of reference that guides the academic community to prepare academic program specification documents in a particular field or specialization. It also represents the overall expectation of academic qualifications, abilities and qualities that graduates should acquire when completing a program of study.

NARS represent a threshold of standards that encourage higher levels of achievement and therefore require educational institutions to distinguish themselves in their educational performance by developing their own Academic Reference Standards (ARS). On the other hand, ARS for educational institutions are higher level of requirements that educational institutions must achieve through their academic programs to ensure that their graduates are able to carry out professional or career practices successfully.

It must be pointed out here that NARS do not intend to provide a unified national curriculum for academic programs, nor do they seek to provide a list of contents for academic programs. Hence, the authors of NARS documents avoided that, because it is the core task of higher education institutions. In turn, higher education institutions should refer to NARS documents to prepare their program specification documents that typically include programs goals, graduate attributes, learning outcomes, study plans, contents, strategies for teaching and learning, assessment methods, etc.

HISTORY OF MEDICAL EDUCATION IN YEMEN

Yemen is undergoing rapid demographic and epidemiologic transitions. The health of the population in the country is threatened by the double burden of lifestyle-associated diseases, and new and existing infectious diseases. To respond to these challenges faculties of medicine were established to educate and train a workforce and healthcare professionals to deal with these health challenges and the changing needs to carry out proper healthcare services. Therefore, the fundamental objectives of these faculties are to produce physicians who are competent in their profession, aware and able to respond to the societies' health needs and able to pursue graduate education both locally and internationally.

At present, several public and private universities are offering medical education programs, such as, Tamar University (1998/1999), Hadhramout University (1997/1998), Al-Hodheida University (1998/1999), Taiz University (1999/2000), Imran University (2015/2016), Dar Al Salam University (2009/2010), Emirates International University (2014/2015). They graduate around 1,400 physicians annually. Faculties of medicine at Aden University and Sana'a University are the oldest faculties; established in 1975 and 1983 respectively. They also have the largest number of graduates and yearly students' admission. The major strengths of these faculties are the infrastructure, qualified staff, laboratories facilities, appropriate teaching environment and varieties of teaching hospitals. In addition to undergraduate medical education, these two faculties of medicine in Sana'a and Aden provide post-graduate programs, where these programs are exclusive to some of the medical specializations. The first private medical school in Yemen was the Faculty of Medicine and Health Sciences (University of Science and technology –Sana'a), established in 1995. The faculty uses the organ system integrated learning approach.

Currently, most of the medical education faculties in Yemen face multiple challenges that are represented by many factors including, but not limited to, the old curriculum, traditional teaching methods, and unavailability of the proper facilities, as well as allocation and utilization of available resources.

Other challenges that face medical education include issues related to appropriate accreditation and standardization of medical education in the ever-increasing number of medical schools.

There were no guidelines that apply to all medical schools before establishing the Council for Accreditation & Quality Assurance (CAQAY). Recently, faculties of medicine are starting to introduce changes in their curricula in order to fulfill the minimum requirement of (CAQAY) in Yemen. This authority was established in September 2009 as a Council of the Accreditation of the Education System in Yemen.

All institutes are mandated to comply with the regulations and policy of this Council. Lately, the Council developed the National Academic Reference Standards (NARS) for Medical Education as a part of medical education reform strategy. It will offer training and consultations to faculties of medicine in the country for the implementation of NARS in order to achieve the optimum standard requirements in the medical education.

NATIONAL ACADEMIC REFERENCE STANDARDS FOR MEDICAL PROGRAMS

I. GRADUATE ATTRIBUTES:

Upon successful completion of an undergraduate medical education program, the graduates will be able to:

1. Demonstrate sound knowledge, skills, and attitudes required for patients' care.
2. Provide health care services at different levels, applying patient safety and infection control measures during practice
3. Work independently and/or in a team and collaborate effectively with other health care professionals
4. Recognize economic, social, psychological, environmental and cultural factors that interfere with health.
5. Behave ethically and professionally when dealing with patients, their families and other health care professionals
6. Communicate effectively with patients, their families and other health care professionals
7. Apply diagnostic, critical thinking, and problem-solving skills necessary for proper evaluation and management of common medical conditions and emergencies.
8. Recognize own professional limits and seek appropriate consultation from other health care professionals when indicated.
9. Establish the foundations of lifelong learning and research, with commitment to continuous self-improvement.

II. LEARNING OUTCOMES

A-KNOWLEDGE AND UNDERSTANDING

Upon successful completion of an undergraduate medical education program, the graduates will be able to:

- A1. Describe the normal structure of the human body at molecular, cellular and biochemical, in order to maintain body homeostasis.
- A2. Recognize the normal human growth and development in all stages of human development.
- A3. Recognize any alteration or abnormality in the function and structure of the human body.
- A4. Identify the etiology, pathogenesis, clinical manifestation, diagnosis differential diagnosis and complication of different communicable and non-communicable disease at the different stages of humans life.
- A5. Conduct different investigations and interpret the results with the Integration of the history findings and physical examination.
- A6. Recognize the principles of epidemiology, prevention and control of communicable and non-communicable diseases.
- A7. Efficiently use the principles of appropriate and cost-effective pharmacological and non-pharmacological therapies.*
- A8. Recognize the psychological, social, and cultural aspects of healthcare.
- A9. Demonstrate knowledge and understanding of legal, medical ethics and patient's and human rights related to medical practices.
- A10. Apply the principles of history taking and physical examination with consideration to patients' mental status, social and cultural background.
- A11. Demonstrate an understanding of medical or health research and basic statistics.
- A12. Describe drug actions: therapeutics and pharmacokinetics; side effects and interactions, including multiple treatments, long term conditions and non-prescribed medication; and effects on the population.

B-COGNITIVE/INTELLECTUAL SKILLS:

Upon successful completion of an undergraduate medical education program, the graduates will be able to:

- B1. Analyze data obtained from medical history, physical examination and Para clinical investigations to reach a final diagnosis and plan the management of patients.
- B1. Implement critical thinking and evidence-based medicine in problem solving in the diagnosis and patients' management.
- B1. Design appropriate management plans for common medical conditions and emergencies.
- B1. Select appropriate investigations, analyze, and solve problems with minimal guidance.
- B1. Appraise and prioritize serious medical conditions and common emergencies.
- B1. Recognize professional limitations and seek advice when needed.

C- PRACTICAL AND PROFESSIONAL SKILLS:

Upon successful completion of an undergraduate medical education program, the graduates will be able to:

- C1. Perform patient centered history taking, physical examination and investigations in all conditions.
- C2. Perform and record thorough mental and physical examination according to different ages and sexes.
- C3. Identify the patient problems and formulate a list of differential provisional diagnoses.
- C4. Identify serious and urgent conditions and tailor management according to expected course.
- C5. Choose the appropriate investigations relevant to differential diagnoses taking in consideration the availability and cost-effectiveness.
- C6. Interpret the investigation results and integrate them with the clinical data to reach the appropriate diagnosis.
- C7. Construct appropriate management plans and evaluate their effectiveness and outcomes.
- C8. Manage life threatening conditions emergency care and basic life support.
- C9. Provide Health education, counseling and appropriate preventive services.
- C10. Prescribe and safely administer appropriate drugs taking in consideration side effects and interactions, including multiple treatments, long-term conditions.
- C11. Perform diagnostic and interventional procedures in a competent and safe way (Annex 1 & 2)
- C12. Record and keep concise and complete medical records according to legal and administrative framework.
- C13. Apply control measures to prevent the spread of infection.
- C14. Discuss safety aspects with the patients and their families before any procedure or intervention and take informed consent.
- C15. Involve the patients and their families in making management decisions.
- C16. Provide care for patients in end-of-life situations offering support to their families
- C17. Adopt professional behavior in all aspects of practice, showing honesty, commitment, integrity and compassion and making the care of the patient the first concern.
- C18. Adhere to the professional standards and rules of the profession.
- C19. Demonstrate respect to different cultures, religions and values and manage all patients equally regardless of their backgrounds.
- C20. Respect confidentiality and privacy of the patients.
- C21. Respect seniority, consult and refer the patient at appropriate stages.
- C22. Apply research, and statistical methods for identification, analyzing & resolution of health problems for further planning.

D – GENERAL / TRANSFERABLE SKILLS

Upon successful completion of an undergraduate medical education program, the graduates will be able to:

- D1. Communicate clearly and effectively with patients, their families, health care professionals and the community through verbal, written or digital methods.
- D2. Respect the different cultural beliefs and values in the community they serve and ensure the privacy of patients' information.
- D3. Work efficiently within a multidisciplinary team and demonstrate ability to build positive working relationships.
- D4. Recognize and respect the contributions of other health care professions.
- D5. Develop a lifelong interest to continue learning, improve skills, acquire, and apply up-to-date knowledge and new skills.
- D6. Utilize health information technology and present information clearly in written, electronic and oral forms.
- D7. Use written and electronic records and other health information for the benefit of the patients.
- D8. Manage time and resources, set priorities and deal with stress in all situations.

Annex .1 (Essential diagnostic and intervention procedures)

- Basic infection control measures
- Venipuncture and collection of blood samples
- Cannulation of veins
- Administer intravenous therapy and use infusion devices
- Administer intramuscular, subcutaneous and intradermal injections
- Using nebulizers and other inhalation devices
- Administer oxygen with different devices
- Insert nasogastric tubes
- Bladder catheterization (Male and female)
- Perform and interpret Electrocardiograms (ECG)
- Manage ECG monitor
- Thoracocentesis
- Paracentesis
- Cardiopulmonary resuscitation and basic life support (BLS)
- Safe blood transfusion
- Basic bedside laboratory tests (annex 2)
- Administer local anesthetics
- Surgical suturing and wound care
- Manage normal labor
- Obtain common swabs for diagnostic purposes
- Skin and subcutaneous abscess incision and drainage
- Surgical scrub
- Write safe and concise prescriptions and medical orders

Annex 2. (Basic practical skills)

- Bedside measuring of blood glucose
- Perform urine analysis using dip-sticks
- Prepare simple blood tests such as complete blood count, blood groups, bleeding time, clotting time and erythrocyte sedimentation rate.
- Prepare samples for routine urine and stool examination and identify common abnormalities.
- Perform tuberculin test
- Perform common bacterial cultures
- Perform pulse oximetry and bedside respiratory function tests

TEACHING AND LEARNING STRATEGIES AND ASSESSMENT TOOLS

NARS approach emphasizes the importance of aligning teaching, learning and assessment with NARS to help students acquire graduate attributes and the intended learning outcomes.

Although teaching and learning strategies and assessment methods vary from one discipline to another and from an academic program to another, whatever teaching and learning strategies and assessment tools are used, they should provide students with opportunities to acquire graduate attributes and the intended learning outcomes. This requires that curricula design and delivery methods should be updated periodically to respond to developments in the subject matter, the results of research about teaching and learning in higher education, changes in national policy, professional practices and the needs of employers.

A. Teaching and Learning Strategies

The introduction of NARS in higher education curriculum development is a new approach that requires higher education institutions to adopt appropriate teaching and learning strategies to help students achieve academic standards and to demonstrate that all their graduates are able to achieve those standards.

Regardless of the teaching approach adopted by a faculty, institutions of higher education should provide a great deal of active learning in which the students are actively involved in the learning process, and allocate enough time for directed self-learning and reflections as to encourage students to develop life-long learning habits.

Curricula should also be designed to provide students with sufficient opportunities to acquire adequate knowledge and to develop practical and professional skills to a level that qualifies them to obtain professional licensing. This requires sufficient practical applications and field training during long periods of their academic study.

In general, teaching and learning in undergraduate medical education programs should use a variety of teaching methods, such as:

- Active Lectures (supported with dissections),
- Group learning and Problem-based learning,
- Seminars, journal clubs and workshops,
- Clinical training,
- Ward and operation theatre teaching,
- Observation and treatment of patients,
- Computer and web-based learning,
- Use of communication and information technology,
- Directed self-study.

B. Assessment Tools

Assessment is the means by which students' ability to meet academic standards is measured and should be a key part of the learning process. To ensure this, faculties should design consistent and credible assessment tools at course level and at program level as well.

On the other hand, NARS require an emphasis on rigorous assessment of practical and professional skills to identify those who are not yet qualified for the profession or occupation. The ways to achieve this may vary, but should always include direct and frequent observations of students during practical applications and field training.

It should also be noted that while it may be difficult to assess professional attitudes directly, the impact of attitudes on students' behavior should be assessed by observing this behavior over a period of time.

Finally, assessments must be accurate but should not be exhausting or repetitive, as this may affect the learning process.

In general, assessment in undergraduate medical education programs should use a variety of teaching methods, such as:

- Short essays,
- Written assessments, such as multiple choice questions (MCQs),
- Faculty assessment by structured observation through checklists and rating scales,
- Multi-source assessments, such as student self-assessment,
- Simulations, such as computer-based clinical scenarios,
- Multi-competency comprehensive assessments, such as viva-voce and objective structured clinical exams (OSCE),
- Work samples, such as, logbooks and portfolios.

TERMINOLOGY

1. Higher education institutions:

These are universities, faculties, higher institutes and academies which offer academic programs that extend for a period of more than three years of study under the supervision of the Ministry of Higher Education and Scientific Research.

2. NARS:

The national academic reference standards prepared by the Council for Accreditation and Quality Assurance with the assistance of specialized experts and representatives of various beneficiary sectors to represent the minimum standards required for accreditation of academic programs.

3. ARS:

Academic standards prepared by higher education institutions, provided that they include NARS as well as a number of standards (attributes and learning outcomes) that distinguish an institution from other institutions (allowing for creativity and diversity).

4. Academic program:

A distinct and well-structured group of courses that, after successfully completed, enable students to get an academic degree associated with an academic program (BA / BSc, MSc, PhD).

5. Graduate attributes:

A set of attributes (competencies) that result from the acquisition of knowledge and skills during the study of a particular academic program, and which identify what the graduate is expected to exhibit at the end of an academic program.

6. ILOs:

Intended Learning Outcomes (ILOs) refer to the knowledge, understanding and skills that specify what a student should know, be able to do and the values to be acquired after the completion of a study unit, a course or an academic program.

7. Knowledge and understanding:

Key facts, concepts, laws, theories and techniques that the students are reasonably expected to acquire in a particular field of specialization. It also includes mental skills such as memorizing and comprehension.

8. Intellectual skills:

These are skills that the academic program seeks to help students develop, such as analysis, the ability to choose from different alternatives, discussion and reasoning skills, innovation, creative thinking and problem solving.

9. Practical and professional skills:

These are skills that enable a student to convert acquired academic knowledge into practical applications such as: ability to diagnose diseases, write medical prescription, manage water resources, or accomplish an engineering design.

10. Transferable skills:

These are general skills that involve several disciplines, such as communication skills, computer skills, IT skills, management skills, discussion and negotiation skills, self-marketing skills, time management skills, teamwork skills, presentation and delivery skills, and research skills.

11. Health care professionals

These are individuals who provide preventive, curative, promotional or rehabilitative health care services in a systematic way to people, families or communities.

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It is essential to acknowledge that the preparation of this document was supported by two parties: the first workshop that was held to develop the first draft of the document was sponsored by Dar Al Salam University for Science and Technology; the Dutch Project sponsored the rest of the work: document review, consultation with peers at universities and organizing the final workshop to announce the document.

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