



The Medical Residency Examination in the Era of the Overhaul of Medical Study Programs, a Call for Reform. Reflections for New Docimological Orientations

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Abstract

The overhaul of medical school graduation programs is part of an innovative approach to quality. Medical educators continually seek to bridge the gap between the needs of medical practice and the growing expectations of their country's communities. The introduction of new programs in 2018, as part of this overhaul, incorporates conceptual curricular aspects such as the organization of studies into three cycles, the competency-based teaching approach, the objectives of training programs, simulation-based learning and objective structured clinical examinations (OSCEs). At the end of the 1st and 2nd cycles, discussions are underway to design the 3rd cycle. In these discussions, access to the various specialties is conditional on passing the residency examination. In this paper, we propose a number of ideas on the possible docimological orientations to be envisaged in the continuity of the innovative framework of the reorganization of medical studies in Algeria. Therefore, this article was conducted to improve the efficiency, equity, and integrity of the resident selection process. We aim to provide some reflections for educational leaders with a clear framework and consistent language to facilitate national discussions.

Keywords: Residency Examination; MCQ; KFP; Validity; Fidelity

Introduction

Medical education is continuously reformed in response to scientific advances and societal needs. The common goal was to create as good a match as possible between medical training programs and the responsibilities that graduates face after registering in the national health system [1]. The year 2018 was marked by the introduction of programs for the 1st year of the first cycle of medical studies [2]. These programs, which are part of the overhaul of medical studies, were launched four years ago, in 2014. At that time, the national focus groups identified several areas for reform. The first was the restructuring of the architecture of the medical studies curriculum into three cycles [3]. The first

cycle of medical studies (PCEM) with 03 years [4]. The second cycle of medical studies (DCEM), also with 03 years [5].

These reforms attempt to adopt a more competency-based approach, focusing in particular on the development of clinical reasoning [5]. The programs and their objectives have thus been established, by training cycle and by teaching units (UE) [2-5]. These programs are based on innovative teaching methods such as clinical reasoning and simulation. In addition to the assessment of knowledge using MCQs, learning assessment methods such as Objective Structured Clinical Examinations (OSCEs) [5] have been introduced. This type of assessment plays a major role in the 2nd cycle of medical studies. Access to the various specialties

is conditional on passing the residency examination. This pivotal stage of access to the 3rd cycle is still under discussion. This work attempts to develop the possible docimological directions that the medical residency examination could take [6-9]. Firstly, by bringing it up to date, while taking account of the overhaul of the curricula, and above all by giving these national examinations valid and reliable docimological dimensions [9,10]. There are two main lines of approach. The first concerns the architecture of the residency examination, both in terms of examinations (in medicine, surgery and basic sciences) and in terms of disciplines. The second is based on the virtues of the residency examination. As the examination is both a ranking and a sanction, the choice of assessment tools is crucial in terms of both validity and reliability.

The architecture of the medical residency competition

For health reasons linked to the COVID 19 pandemic, the national medical residency examination has been adapted to this particular situation. Instead of dividing the examination into three tests, each lasting three half-days, the tests have been restructured into a single test, with multiple-choice questions covering the knowledge required for the traditional medical, surgical and biological tests, and lasting four hours. One of the problems that arose when the syllabuses were revised was the lack of a national syllabus that would enable medical faculties to organize an examination with the same procedures and the same questions at the national level, and thus guarantee the uniformity and validity of the tests.

This thorny issue has been resolved by adopting national curricula approved by the body qualified by the Ministry of Higher Education [11]. The teaching objectives have thus been set down and approved by the authorities [5].

This pedagogical advance can help in the choice of subject knowledge to be assessed by the residency exam, since the objectives are transcribed and validated [5]. The interesting thing is to choose the most relevant ones for assessment in this competition. The choice of disciplines to be included in national residency programs is another thorny problem to be resolved. It would therefore be very difficult to strike a balance between the choice of the teacher who will try to defend his or her discipline and the docimological legitimacy of assessing the relevant skills, particularly clinical reasoning, in this type of examination. We can thus classify the disciplines into two categories, after determining

the number of questions that each candidate is required to prepare. The subjects that "all candidates must master". These subjects may cover the three competitive examinations (medicine, surgery, and biology). They will be rank A knowledge, i.e., at the level of the retention of Bloom's taxonomic classification [12].

The other category of subjects will be the so-called rank B subjects, where the tests assess more in-depth knowledge at higher levels than recall. In this category, "Candidates must demonstrate" more than recall and memorization (application, analysis, evaluation, and synthesis) [13] of certain subjects or groups of subjects. In France, the reform of second cycle studies has set 356 questions for the national dematerialized examinations (EDN) [14]. The criteria for choosing B-rank specialties must take account of the degree of preparation of candidates, the interest they show in certain specialties, and the needs expressed by the public authorities.

Since 1978, Spain has hosted an annual Médico Interno Residente "MIR" test. There were 225 multiple-choice, single-selection questions on the test, plus 10 reserve questions that might be related to any area of medicine. The exam could be finished in a maximum of five hours by the candidates. Questions pertaining to one or more images have been regularly included in MIR exams since 2009 [15].

In Japan, The National Examination for Medical Practitioners contain many items that are also included in the Model Core Curriculum for Medical Education. Since 2020, the exam held two parts: written tests and Post-Clinical Clerkship (Post-CC) OSCEs [16].

Outside the COVID 19 period, each Algerian medical school offered around 300 MCQs. This number is close to that of the EDN. It would be wise to gravitate towards a number of questions that candidates will be able to prepare. We feel that 300 to 350 questions would be acceptable. Sixty percent of the questions will be grade A and 40% grade B. The choice of which questions will be grade A or B will be left to a group of experts who will judge the relevance of the disciplines to be assessed by candidates for this type of competition.

Consequently, single-response MCQs and multi-response MCQs are preferable for assessing rank A knowledge. However, this

type of MCQ should not be ruled out for the assessment of rank B knowledge, in addition to other types of questions that are more valid, more relevant and above all more reliable, such as content-rich MCQs or clinical MCQs [14], progressive clinical files and Key Features Problems (KFPs) [14].

These tools will be described in greater detail in the section on the virtues of the medical residency competition. For writing MCQs (single response, multi-response and clinical content). The National Board of Medical Examiners (NBME) guide to writing MCQs can be very useful [17].

The docimological virtues of the residency competition

Assessment is a key element of any educational programme [18] and if used appropriately, assessment can promote learning and quality [18-21]. Kelly [22] first used several types of MCQs as an assessment method in 1914. Since then, different subtypes of MCQs have been developed, including the single best answer questions [23]. The NBME's guide to writing MCQs is the most widely cited reference for developing and writing MCQs [17]. In this guide, MCQs are classified into two categories. MCQs which supports both true and false answers. Candidates are required to distinguish between true and false answers. MCQs that support a single best answer (the Single Best Answer SBA) [24]. However, it is not advisable to use the first category of MCQs [21]. This type of question is prone to a number of clerical errors, such as the use of inaccurate terminology [25] and ambiguity affecting the proposed answers, which must themselves be consensually right or wrong [23]. It is very important to observe the psychometric criteria for assessment, validity, reliability, discrimination and difficulty indices [26]. In the original sense, the problem of validity is knowing whether a test really measures what it is supposed to measure (Kelley in 1927) [19]. It expresses the external quality of a test, often for predictive purposes, through the correlation of the measurement obtained with another objective measurement deemed relevant [27-29]. Validity in the broad sense also depends on the context of use, the method of administration and perhaps even the use to which the results are put [30]. Fidelity, considered to be a form of validity, emerged at the same time. It refers to the stability of scores when the same test is taken several times [31]. Fidelity is based on the hypothesis that it is possible to measure, for example, a cognitive activity by asking several questions whose answers form a consistent whole and show a certain stability from

one context to another and from one moment to another [32]; where applicable, fidelity is based on the internal structure of the test [33]. These two docimological virtues are based on a complex area of psychology [34].

For reasons of feasibility, "Le guide pédagogique pour le personnel de santé de JJ GUILBERT" [35] provides a simplified overview of their use in assessment. The same applies to the other two criteria of discrimination and difficulty.

We recommend, in the context of this reflection on docimological guidelines, that they be taken into account and that MCQs, preferably of type A supporting "The best answer is right" [36,37], be included in the questions for the medical residency examination.

We believe that support from a training team and the drafting of a teaching guide are necessary. It is advisable to validate the MCQ banks by means of a mock test [38] at local, regional or national level. In addition to the computerized correction of the MCQs, the two discrimination and difficulty tests will be calculated. This type of mock test guarantees the psychometric qualities of the MCQs. Once the questions are valid, reliable and discriminating, they can be included in the bank for the national competition.

One of the expected benefits of a possible revision of the medical residency examination is to focus assessment on verifying the skills acquired during the first two cycles. In response to the logic described above, the choice of tools must be valid and reliable. As soon as the Epreuves Classantes Nationales (ECN) were introduced in France in 2004, a number of pleas were made [8,9,39] to draw the early attention of educationalists, faculty heads and politicians to the potential pitfalls of this overhaul. The result was that the ECNs did not necessarily test clinical reasoning [9]. They would be ranking tests devoid of the certifying qualities of skills [8].

In Algeria, we support the postulate that the medical residency examination should include an assessment of the clinical skills acquired, in particular the two stages of clinical reasoning, diagnostic resolution and decision-making [39]. A type MCQs with clinical vignettes are advocated by certification bodies [37,40]. The number of MCQs of this type to be awarded per discipline or group of disciplines of rank B as described above is to be defined by the focus group as mentioned above. In addition to MCQs with

clinical content, “key element problems”, which also enable clinical decision-making to be assessed, are recommended for end-of-study examinations: clinical or certification examinations [41]. Created in the 1980s out of a desire to improve the assessment of decision-making by future doctors in the Canadian national qualifying examination [42,43], key element problems appear to have achieved this objective, with a significant correlation between scores on key element problems and subsequent quality of clinical practice [44].

Overall, the literature suggests that key element problems are a valid tool for assessing clinical reasoning [44,45]. They have been widely used in medical schools in North America, the Netherlands and Australia for over twenty-five years [46]. They are often referred to by their acronyms KFE (key features examinations) or KFP (key features problems). A case statement, followed by two or three questions, is designed to assess only the fundamental aspects (the key features) of the solution to the problem [47]. They involve candidates applying their knowledge to solve a problem, i.e. using their knowledge to guide their decisions to look for clinical clues, formulate diagnostic hypotheses, choose a management method, and assess severity, and order investigations or follow-up examinations. Several studies have demonstrated the validity and reliability of this type of tool [44,48]. The French Conference of Deans of the Faculties of Medicine has organized workshops and seminars to support the pedagogical premise of introducing KFPs for the NDA [49]. The drafting of key element problems as part of the educational project for the national medical residency competition can be supported by a group qualified in the field of docimology.

Conclusion

The overhaul of medical school curricula has made remarkable educational progress. The new curricular guidelines have introduced new approaches such as competence, simulation, and clinical reasoning. New teaching methods, such as OSCEs, MCQ clinical cases, and key element problems, have been given a prominent place in this redesign to ensure a continuum of quality. The authors hope that these reflections related will stimulate discussion about the docimological orientation of the medical residency examination in order to advance health globally. They also hope that this dialogue will lead to measures that will strengthen

the selection criteria for medical residents and ultimately improve patient care in Algeria.

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