

DOI: <https://doi.org/10.5554/22562087.e1089>

Postgraduate medical education in Colombia. Proposals to improve it

La educación médica del posgrado en Colombia. Ideas para mejorarla

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Abstract

After 70 years of the formalization of medical specialties in Colombia, very little progress has been made in the educational models for the acquisition of clinical competencies in these postgraduate programs.

Furthermore, although there is already a law on human resources in health, the Colombian medical education system lacks specific regulations on the training of health professionals (physicians) in the different medical specialty programs offered in the country.

Likewise, at present, factors such as the financial crisis of public hospitals, the limited number of accredited hospitals and the growing number of medical schools and specialization programs, affect the comprehensive and equal development of medical competencies of professionals who are trained as specialists in the different postgraduate medical programs offered in Colombia.

In view of the above, the purpose of this article is to present a proposal for postgraduate medical education that prioritizes the adequate acquisition of competencies over compliance with the time required to complete the curricula of the different medical specialties. However, this involves several prerequisites: a regulatory body in charge of overseeing and monitoring the training of medical residents or specialists in the country; strong training in university teaching for professors practicing in medical schools and university hospitals; the standardization of the graduates profile; adequate financing of university hospitals, as well as appropriate support in the process of accreditation as such, and the self-evaluation and continuous improvement of postgraduate medical programs.

Key words

Health Education; Medicine; Postgraduate Training Programs; Professional Knowledge and Skills; Anesthesiology.

Resumen

Después de 70 años de la formalización de las especialidades médicas en Colombia, ha habido muy pocos avances en los modelos educativos para la adquisición de competencias clínicas en estos programas de posgrado.

Además, a pesar de que ya hay una ley sobre el talento humano en salud, en el sistema educativo médico colombiano no hay regulaciones específicas sobre la formación de profesionales de la salud (médicos) en los diferentes programas de especialidades médicas ofrecidos en el país.

Igualmente, en la actualidad factores como la crisis financiera de los hospitales públicos, el escaso número de hospitales acreditados y el creciente número de facultades de medicina y de programas de especialización afectan la adquisición integral e igualitaria de competencias médicas de los profesionales que se forman como especialistas en los diferentes programas de posgrado médico ofrecidos en Colombia.

Teniendo en cuenta lo anterior, el propósito de este artículo es presentar una propuesta de educación médica de posgrado que priorice la adecuada adquisición de competencias por encima del cumplimiento del tiempo fijado para completar los planes de estudios de las diferentes especialidades médicas. Sin embargo, para esto se requieren varios aspectos: un ente regulatorio encargado de vigilar y monitorear la formación de los residentes o especialistas médicos en el país; una fuerte capacitación en docencia universitaria a los profesores que ejercen en las facultades de medicina y hospitales universitarios; la homogenización del perfil de los egresados; una adecuada financiación de los hospitales universitarios, así como un apropiado acompañamiento en su proceso de acreditación como tal, y la autoevaluación y mejoramiento continuo de los posgrados médicos.

Palabras clave

Educación en salud; Medicina; Programas de posgrado; Conocimiento y habilidades profesionales; Anestesiología.

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INTRODUCTION

The model of medical education in Colombia has several particular characteristics that lead to traditional models of education being based on training a professional who lacks a foundation in general studies (sciences, liberal arts, etc.). Moreover, Colombia experiences a crisis in its healthcare models because of poor coordination with the current medical education models existing in the country and the lack of a regulatory body for medical postgraduate programs – or at least – the role of the regulatory authority is unclear. (1,2)

It is now known that there are gaps in the results of some health care processes between countries according to their income level, especially in terms of surgical services (3), which may be the result of inadequate infrastructure, fragmentation of care processes and poor quality.

With the quest for excellence in postgraduate medical education in mind, this article suggests: to develop learning models based on competencies and not on time spent, and thus be able to determine the role of the professor in postgraduate medical education; and to submit a proposal for postgraduate medical education that prioritizes the adequate acquisition of competencies over the time required to complete the studies of the different medical specialties. This proposal is an initial strategy to change the behavior of students and professors of postgraduate medical programs in the country, and to apply comprehensive pedagogical models in the different specialties; hence it will be possible for instance to establish how many esophagectomies with gastric conduit elevation could have been performed by a general surgeon, or how many thyroid storms a resident in endocrinology or internal medicine should have handled, or laryngoscopies in anesthesiology or hysterectomies and delivery care in obstetrics and gynecology, etc.

Postgraduate medical education

Based on the observations submitted in documents suggested by the Colombian Association of Medical Schools (Ascofame), this article addresses the concerns about postgraduate medical education through strategies aimed at accomplishing a state-of-the-art, and mostly effective postgraduate medical education. (4)

General medical education has a series of peculiarities that make it different from education in other areas. (4) One of these distinctive characteristics is that health – defined as a “a state of complete physical, mental and social wellbeing”, and not merely the absence of disease or infirmity [WHO] (5) — is a fundamental right in Colombia (Law 1751/2015) (6); therefore, the first challenge faced by professors, is that by training people in medicine, they are also contributing to the social development of the country, ensuring wellbeing and enjoyment of health for all Colombians. In this regard, professors have the social responsibility to train undergraduate and graduate students not only in scientific, academic, basic/clinical aspects, but also in social, ethical and humanistic aspects, so that they can have a holistic education as citizens. (1,7)

Another challenge is that there are many medical specialty programs that do not have accredited practice sites, genuine university hospitals, adequate teaching support and sufficient clinical internships. Similarly, there is a general shortage of laboratories, clinical scenarios and qualified personnel for the training of medical specialists. Finally, an additional problem is the interdependence between the health system (Ministry of Health and Social Protection) and the educational system (Ministry of Education), which have not yet established fluent communication and whose lack of interaction negatively impacts the training of health professionals, medical doctors and the different specialties and supra-specialties. (4)

Understanding education as a complex human and cultural process (8), medical

education requires a better understanding of human processes, especially when the emotional burden it entails has not been sufficiently recognized; furthermore, Burnout syndrome, depression and suicide have a high incidence among health professionals and even affects patient safety. (9-11) The academic burden and intense work schedules of medical specialists also favor detachment towards patients and establish a dichotomy between the learner and the caregiver, due to the lack of appropriate training processes devoid of a curriculum that transcends the integral and full development of the individual, when the latter is persistently exposed to human pain. (10,12,13) Therefore, the vision of medical education should be the result of a holistic process that ensures the interdependence of all the stakeholders: governmental, cultural, social, ethical, humanistic, etc.

Medical education is a continuous process that has been described as a lifelong training (4), which requires the support of public policies in order to fulfill its main and transcendental objective: the health of all peoples. (14) When talking about postgraduate medical education in Colombia, one must go back to the second half of the 20th century, with two distinctive groups of professionals: physicians who emigrated from Latin America and Europe to train in the United States, and physicians who focused their careers on a single type of medical specialty and were granted the title of specialist because of their vast experience in one of the different specialties existing at that time. At the end of the 1950s, postgraduate programs emerged and, for example, professors Germán Muñoz Wutscher and Jaime Casasbuenas Ayala –pioneers in Anesthesiology and Resuscitation at the Faculty of Medicine of the National University of Colombia–, although they did not have anesthesiology degrees, stood out as educated and humanist professors with expertise in Intensive Care and Anesthesia during this period. (15) Subsequently, postgraduate medical programs were organized and have

been developed up to the present, in which education with progressive delegation of responsibilities has been the pillar in training of the different specialists in the country.

However, when considering the technological development in health and the role of the health system vis-à-vis medical education, the national landscape is lagging behind as reflected by the stagnation of acquired skills; poor articulation between secondary and undergraduate education; and a lack of coordination between secondary and undergraduate education (16); the absence of "general studies" in undergraduate and postgraduate training, also called liberal arts in the Anglo-Saxon nomenclature, and integrating the arts, sciences and human sciences (7); the lack of awareness among professionals of their humanistic and altruistic role of what the health professions involve (17); the burnout syndrome among health professionals (18); the lack of resources to equip qualified and accredited hospitals, especially in border areas or remote areas far from the capital city, which are also affected by other health determinants (education, drinking water, adequate nutrition, etc.) (19); the absence of an information system on aspects of medical employment and quality health coverage; the employment of health professionals, largely without job stability or under substandard contract conditions (20); low salaries/honoraria, as well as frequent untimely payment or chronic debts, etc. All of the above is worrisome, and the situation tends to get worse, because of the high level of generalized corruption in the country (21) and within the health system itself. (22)

Vocational training and learning models

Traditional education, which has been based on behavioral models, has been called expository, verbalist or lecture-based (23), and is applied in most scenarios

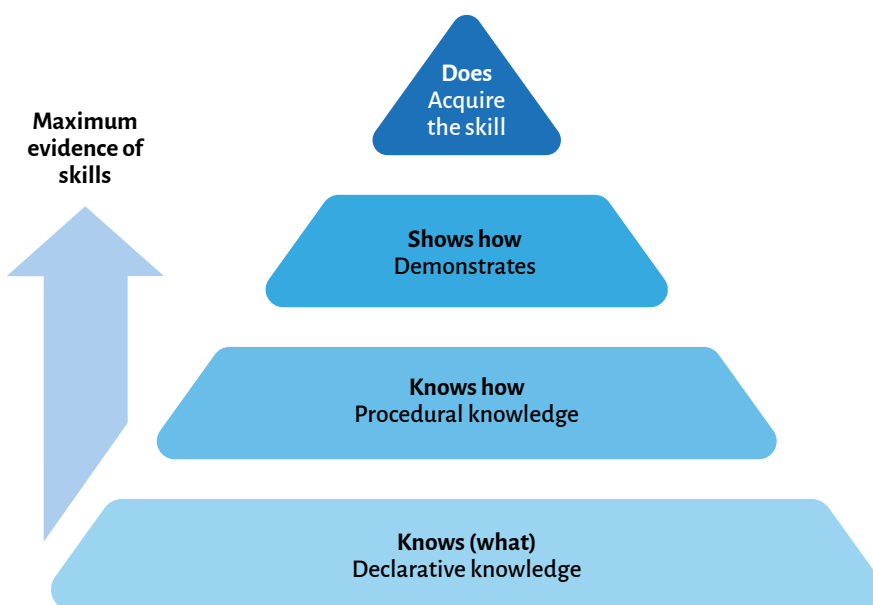
to the study of basic sciences during undergraduate medical training, and an increasingly deficient practical training with patients, which hinders the development of competencies, since these are achieved only when the student is exposed to interaction with the patient, the family and the rest of the health team. Evaluation exclusively based on memorized data, and depends on the unilateral decision of the professor, fails to consider the student as the protagonist of learning, and favors the "referral" model with limited ability for resolution that the current physician has. (23) The reality of these arguments in the country is palpable when we observe a growing number of universities, medical schools, and postgraduate programs in the health area, but limited opportunities to practice in certain areas of specialization (quotas) or training in accredited university hospitals. (24)

Learning is like a fingerprint, each person has a different learning curve, a particular style; on the other hand, teacher-based models generally set exact timelines. (25) The premise is that within those timelines, all students (in a synchronous

way) should accomplish a series of pre-set skills. (26) Students in general can be haptic, visual or auditory and the professor should be competent enough to take advantage of the student's potential using flexible methods, with experiences in virtual and simulation scenarios in the clinic to develop individualized competencies, through CUSUM Curves. (27) The opportunities to learn and achieve the pyramid of knowledge (Miller's Pyramid) (28) are based on a gradual exposure of the resident – constantly monitored - until achieving the desired clinical competence; it is the best option to ensure appropriate procedural learning, as described in learning in anesthesiology (29), above the economic interests of higher education institutions or hospitals eager for quantity rather than quality and devoted care (Figure 1). (28)

According to the Ministry of Health, Law 1164 of 2007 (Law of Human Resources in Health) (30) defines clinical competency as "a suitable performance emerging from a concrete task, in a particular context. This performance is accomplished through the acquisition and development of knowledge, skills, abilities, aptitudes and

Figure 1. Modified Miller's Pyramid.



Source. Modified Miller's Pyramid (28).

attitudes which are expressed in being, knowing, doing and knowing how to do”.

From its inception, specialty training based on time and education with progressive delegation confronts young physicians with learning a medical specialty not as students but as trainees, thus generating variability in both exposure to cases and contact with patients, and privileging students who had more opportunities than others, resulting in inconsistencies for achieving comprehensive competency-based training; furthermore, many medical schools favor economic interest more than high-quality medical education. (29)

Physicians who are doing a postgraduate degree or residency should be considered specialists in training, since in many health institutions in Latin America, the delivery of care in some hospitals where there is not enough labor force depends on them (31). This was one of the justifications for the current residents' law in the country. (32).

Most higher education institutions have a curriculum based on competencies guided by Bloom's taxonomy (33), which seeks to ensure that students develop three large groups of domains: the cognitive domain, the affective domain and the psychomotor domain; this methodology seeks to take students from a simple acquisition of knowledge to its synthesis and analysis. (34) However, with the curricula for medical specialties currently in force, it is evident that there is no micro-curricular development that demonstrates how this knowledge is acquired and synthesized, and the lack of clarity about curricular activities perpetuates the development of scholastic models in which the professor is the center of knowledge, with vertical transmission of knowledge; under this curricula, class models are based on the traditional education of a professor or a student giving the class and the others listening and learning. (35).

In general, self-evaluation of graduate programs is another weakness in the accreditation process; few programs have completed the self-evaluation guidelines.

(36,37) The National Accreditation Council indicates six key factors for the accreditation of postgraduate programs: professors, internationalization, students, academic processes and curricular structure, research, and innovation and interaction with the environment (38); two more factors have been added: academic factors and learning outcomes and educational models.

Competencies-based model

Health education institutions should strive to fulfill the three missions: teaching, research and extension, to promote value that contributes knowledge and responds to the demand in the provision of health services with quality, responsibility and effectiveness; therefore, it is necessary to move from transmission to systematization of knowledge (teaching) based on competencies; creation of new knowledge (research); and application or use of knowledge (extension). (39)

Each university must work on the micro-curricula that clearly specifies the purpose of the activities and the appropriate level of performance, and the way to record and verify all of these processes; thus, feedback spaces will be generated, where the factors in favor and against the competency-based model will be evidenced and improvement plans may be implemented to offer a homogeneous and quality postgraduate medical education that supports the capabilities of professionals who will then go out into the labor market and will be the guarantors of the right to health. The governing body should be the Ministry of Education with the support of Ascofame and of the Colombian Association of Scientific Societies – together with its voluntary medical recertification agency - CAMEC.

Proposals

In this quest for change from time-based education to competency-based education,

the following challenges arise: to know the competencies and development models, and to propose a self-assessment. This would be the first approach to change, and could be developed based on the above-mentioned Miller's pyramid (28), which suggests four steps of learning: Knowing, Knowing how, Demonstrating and Doing. Based on these steps, appropriate clinical competencies or models - such as the one proposed by Dreyfus (40) - are established or tools are implemented in the acquisition of surgical (technical) skills — such as OSATS (objective structured assessment of technical skills) — for medical-surgical postgraduate programs (41), where progress is not based on time, but on the successful completion of five levels of learning and the performance at each one of these levels will depend on the student. The advantage of competency-based medical education is that it can be combined with Miller's model, in which the novice, knows; the advanced learner, knows how; the skilled, shows; the competent, does; and finally, the expert, who is the practicing physician, has high resolving power. (40) Humanism, ethics, compassion and altruism must be comprehensively incorporated through humanization in three fields of action: health care focused on the patient, family and caregivers; humanization in education processes, focused on students; and humanization in the quality of life and working conditions of health professionals. (42)

In the search for establishing adequate competencies for postgraduate students, training in medical-surgical specialties, such as Anesthesiology and Resuscitation, has been given through isolated training in different scenarios: intensive care, operating rooms, preoperative assessment (43); however, new developments in health models and the form of care require that all concepts be unified to develop comprehensive care models, which in the care of surgical patients has been called Perioperative Medicine; but, in order to implement these new models, changes are needed in the approach of

the teaching/learning model, in which a radical transformation is appreciated in the delivery of care by the entire health team (interdisciplinary work), which leads to a significant improvement in outcomes. (44) Table 1 describes the key changes suggested for the transformation of postgraduate programs.

The participation of graduate students becomes active, purposeful and proactive. At this point, further attention is required with regards to the need to develop non-technical skills that allow students to communicate with their peers in other specialties, with in-hospital and out-of-hospital paramedical care personnel, and with family members; to this end, curricular programs should develop and include didactic strategies that allow for the development of these competencies. (40,45)

Currently, the effectiveness of simulation in the acquisition of technical and non-technical competencies and thinking skills has been demonstrated in medical education (27,46). However, there are few scenarios in which simulation is used as a tool to acquire non-technical

skills. Based on this argument and on a number of studies that show the benefits of simulation in the acquisition of nontechnical skills (45), simulated scenarios should be increased within graduate medical education and progress should be made in the development of new perioperative medicine programs. (47)

What is missing?

The underlying premise of these arguments is that as long as there is no unified criteria for evaluation and no uniform competencies are developed in each of the physicians in training, there will be a disparity in the concepts, competencies and skills developed within the national training programs in medical specialties. It is vitally important that each university and, above all, the medical specialists who teach or are in charge of physicians in training, know what competencies they must acquire, the roles and scenarios where they will perform, the number of procedures necessary to acquire the different competencies, and the non-technical skills

to generate an environment that promotes the well-being of both individuals (person-centered care) and health professionals and administrative and institutional support staff.

In Colombia, postgraduate medical education currently depends on the universities; however, the names of the postgraduate degrees are different from one another. In the case of anesthesiology, for example, there are "specialist in anesthesiology and resuscitation", "specialist in anesthesiology", "specialist in anesthesiology and perioperative medicine". In addition to differences in names, there are also differences in the number of credits and the time required to complete the specialization. (48) Practice sites vary in both complexity and resources and, in some situations, practice sites are considered insufficient for the needs of individual students, or practice settings fail to provide the context for further development of the specialty.

In the search for improving academic processes and, above all, for standardizing and developing the profile of specialists in the country, the proposal for the medical specialist training model should be aimed at a restructuring health education and restructuring the comprehensive training of human resources in healthcare, in order to establish the necessary parameters of competencies both for admission to medical training programs and during specialty training. The contents should be based on models of primary health care integrated with care based on interprofessional and interdisciplinary education in which the role of medical specialists is crucial (49); then, estimate the real need for the number of both general practitioners and specialists in each area, the number of retired practitioners at present, and the opening of new vacancies, instead of irresponsibly opening improvised medical education institutions with the primary objective of obtaining economic dividends from education. There is need to establish how many specialists the country actually needs and which are the accredited institutions

Table 1. Proposed transformation of the medical postgraduate programs.

Implement competencies-based learning in accordance with each specialty, establishing self-evaluation guidelines.
Encourage the social responsibility of training undergraduate and graduate students not only in scientific, academic, basic/clinical aspects, but also in social, ethical and humanistic aspects.
Work on micro-curricula, in which the activities to be performed, the appropriate level to achieve the objectives of the competencies, and the procedures for recording, verification and self-assessment are specified in a timely manner.
Ensure that the practice sites are accredited as genuine university hospitals, with adequate teaching support and sufficient clinical practice opportunities.
Overcome the generalized shortage of laboratories, clinical settings and qualified personnel in comprehensive teaching for the training of medical specialists.
To strive to standardize postgraduate medical programs, starting from the degree granted, to the credits and basic competencies achieved, in accordance with international guidelines.

Source: Authors.

for the training of human resources in healthcare. (50)

Once the postgraduate medical education system is restructured in Colombia, it would be highly advisable to provide continuous and on-going medical education, professional development programs for each specialty, and embrace the responsibility of voluntary reaccreditation through CAMEC, (similar to The Accreditation Council for Graduate Medical Education in the United States) (51), to ensure a conscientious and holistic development based on the medical education the country needs, standardizing the practitioners' profile and minimizing the differences in the quality of the programs. Having skilled and sufficient manpower is the challenge facing the Ministry of Education (16), and the commitment of both, the higher education institutions and the professional associations.

It should be highlighted that medical education does not only depend on the university, but also on the university hospitals. Hence, it is mandatory to regulate the teaching/service agreements to determine the minimum conditions that a hospital must meet to become a university hospital, the levels of care, the number of postgraduate students that can be admitted according to its capacity for care, teaching and university welfare. Furthermore, to ensure that these hospitals are able to operate without the support of the trainees acting as specialized practitioners when these trainees have not yet completed their postgraduate program. (51)

The Residents Law (Resolution 1872/19 that regulates Law 1917 of 2018) (32) is actually a victory for the almost 5,000 resident physicians which makes them physicians-in-training granting them the right to receive wages as a compensation for their clinical, educational and support work at the various healthcare institutions, in addition to their academic activities.

As can be seen in the curricula structured in each program, no taxonomy has been applied for the definition,

training and evaluation of competencies on a global scale; therefore, before thinking about the individual development of educational models, a national policy should be established that allows for the homogenization of training centers.

The role of the professor

In the current medical education system, it is difficult to find the categorization of professors (52), their competencies and their role, as well as the ratio between the number of certified professors versus the number of students to be certified. This scenario is present in all postgraduate programs, since not all institutions that act as training sites for specialists have certified faculty, to the detriment of the comprehensive training of residents.

According to Serra, "the novice professor who starts to teach only has scientific training in the discipline he/she teaches, but does not have the pedagogical foundations to manage the teaching-learning process". (52)

In Colombia, most of the higher education institutions and university hospitals lack a teaching career ladder that would allow those interested in teaching to advance and become qualified. This prevents current medical education from having professionals trained in pedagogy to practice as a professor; often, professors are not associated with higher education institutions and are not classified as faculty in hospitals. Hence, their practice becomes a mixture of daily professional activities and "quasi-teaching activities" that often becomes a burden that hinders good professional performance.

However, the scenario is not entirely discouraging, since there are some institutions, such as the National University of Colombia, that offer postgraduate programs in Medical Education and Pedagogical Support that can have a favorable impact on faculty training of many candidates for the commendable task of educating and training health

professionals in the country. This teaching candidate must be highly motivated to voluntarily acquire the various teaching methods and strategies, must be familiar with the environment, evaluate it, and implement changes in the daily practice of his/her professional activity that will allow him/her to develop new pedagogical and didactic styles consistent with the actual situation of each specialty and each student. This must go hand in hand with continuous education in virtual scenarios, simulation scenarios and extracurricular activities. (12)

It is vitally important to recognize the intrinsic and spontaneous teaching activity of each physician in his/her professional practice, both with peers and patients; however, this work should be acknowledged as part to the daily professional practice. Health care institutions should provide training tools so that professors, in addition to keeping up to date with the state of the art of medicine, have the tools to be able to train their peers and thus guarantee the quality of education. (4)

In addition to their role as professors, practitioners in charge of training physicians and medical specialists are expected to have adequate training in liberal arts, consistent with the goal of humanizing medicine and avoiding a dissociation between theoretical knowledge, scientific progress and humane care, in addition to a hidden agenda to communicate values and exhibit an exemplary human behavior.

CONCLUSIONS

Current medical education in our country is far from perfection; there is a need to establish strong linkages among secondary, undergraduate and postgraduate education, and this is the responsibility of the government through the Ministry of Education. In addition, medical education requires integrating general studies in the training of general practitioners and specialists, providing an adequate environment that encourages

the student to be the protagonist in the process of gaining knowledge; promoting the development of skills beyond pre-established timelines at all levels of training, taking into account any differences in learning, resources, the number of cases, the accredited environment and the faculty. Working together, the Ministry of Education, the Medical Schools (postgraduate programs), ASCOFAME and the scientific and professional associations will be able to implement the necessary changes in education – including the undergraduate programs – in order to fulfil the postgraduate education needs of the country.

Conflicts of interest

The authors have no conflicts of interest to disclose

Financing

The authors' own resources.

Acknowledgements

Our appreciation to Jorge Humberto Reyes Pimiento, industrial designer, for his contribution in designing [Table 1](#) and [Figure 1](#).

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