



QUALITATIVE ORIGINAL ARTICLE

MEDICAL EDUCATION: ORIGIN AND EVOLUTION AS SCIENCE

LA EDUCACIÓN MÉDICA: ORIGEN Y EVOLUCIÓN COMO CIENCIA

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ABSTRACT

Introduction: Medical education has been from the practice a set of knowledge that reveal their identification as science, the present article of position, shows the results of the debate about its principles, features and premises that offer internal logical coherence. *Objective:* to characterize Medical Education from its origin and evolution as science. *Developing:* According to the concept of Medical Education, precise to give internal logical consistency to this new science, the authors they do not try to provide a conclusive and absolute definition, but to provoke controversy among the medical educators belonging to the Medical Sciences Universities to socialize in the scientific community the need for its conceptual renewal and offer a first approximation to its categorical evolution. *Conclusions:* The epistemological reflections about Medical Sciences Education, start from the definitions of medical education, which must be rooted with other theories and branches of science in the construction process as an ideal reflection of the essential relationships of their reality and, consequently, remain subject to development.

Keywords: epistemology, health management, medical education

RESUMEN

Introducción: la Educación Médica ha sido desde la práctica un conjunto de saberes que revelan su identificación como ciencia, el presente artículo de posición, muestra los resultados del debate acerca de sus principios, rasgos y premisas que le ofrecen coherencia lógica interna. *Objetivo:* caracterizar la Educación Médica a partir de su origen y evolución como ciencia. *Desarrollo:* en torno al concepto de Educación Médica, preciso para darle consistencia lógica interna a esta nueva ciencia, los autores no intentan proporcionar una definición concluyente



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y absoluta, sino suscitar controversia entre los educadores médicos pertenecientes a las Universidades de Ciencias Médicas para socializar en la comunidad científica la necesidad de su renovación conceptual y ofrecer una primera aproximación hacia su evolución categorial. *Conclusiones:* las reflexiones epistemológicas alrededor de las Ciencias de la Educación Médica, parten de las definiciones de educación médica, lo que debe enraizarse con otras teorías y ramas de las ciencias en el proceso de construcción como reflejo ideal de las relaciones esenciales de su realidad y, consecuentemente, quedar estar sujeta al desarrollo.

Palabras clave: epistemología, gerencia en salud, educación médica

INTRODUCTION

In all the branches of the sciences and the arts terms with specific meanings are usually used with respect to each one of their areas of knowledge. However, as its development new profiles were modeled and increased, the meaning of some definitions may not be clear for those who even in the same field with the same objectives but with performances already marked differently, neither they nor their trainers, don't feel distinguished. Medical Education Sciences are not excluded from it.

Motivated by the topic in relation to the concept of Medical Education, necessary to give internal logical consistency to this new science, in this article the authors don't try to provide a conclusive and absolute definition, but arouse controversy among medical educators belonging to the Medical Sciences Universities to socialize in the scientific community the need for its conceptual renewal and offer a first approximation to its categorial evolution and with it stimulate the discussion in an area still full of debate and different ideas also in the social imaginary .

Usually in the specialized literature, medical and medicine terms are more discussed, excluding the space of nurses and health technologists, among other human resources, which is compatible with medical and medicine concepts, but is not exclusive to them.

Currently the concept of medical education shows biases that reflex the existence of unequal conceptions in the way of approaching it, which may be given as being a science in construction, but which still affect its status as a science and the strength of its categorial system and convergence in the social imaginary.

Although there is consensus in considering that medical education is a social phenomenon, historically determined, that has an integral character, that influences all spheres of human development, it is also used to refer only to the formation of values, attitudes, convictions, feelings, that is, to the affective sphere, giving rise to inconsistencies and polysemy of the term, since the criterion of considering the reference only to the Doctor still predominates in Medicine, despite that the statements of principles, objectives, are also typical of nurses and technologists, among other health professionals, as belonging to a health team formed in unity, although this relationship is not always understood in the same way in the scientific community .

For the epistemological reflections of Medical Sciences Education, the concept of medical education must be rooted in the theories that compound Medical Sciences, Health Sciences, Nursing Science, Pedagogical Sciences, Education Sciences and Health Technologies that allow, among others, its conformation as a need within the scientific community to strengthen its logical consistency internal, hierarchical logical structure, external consistency, as well as the ideal reflection of the essential relationships of its reality and, consequently, remain subject to development, this article is guided towards that way .

DEVELOPMENT

Systematization made to the diversity of definitions that exist on medical education, makes that the authors consider the need to highlight three dimensions in the concept of medical education: in the formation of care professionals for the three levels of health, health teams, which recognizes the leading character of the medic, but it cannot exclude nurses, technologists, psychologists, health informatics, stomatologist roles, among other



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human resources that participate in services and health areas, as well as the dimension related to epistemes as a science.

That is to say, the doctor of medicine, like the rest of the professionals and specialties, in its formative dimension, has to be linked with the knowledge, skills and values essential for the interaction with others from the dual vision: as students and trainers.

As a concept, medical education should be preserved as a category that designates the continuous, non-linear and ascending process of an autonomous and self-determined functioning of the professional in training in an inter-relational context, with the objects of his particular profile, and the other members of health care, hence they intersected with health education or biomedical sciences, without losing their own essence as a social phenomenon.

A part of significant importance in the process of construction of a scientific theory is in the identification of relationships, regularities, principles and laws that make it possible to offer internal logical coherence to the Medical Sciences Education as a scientifically proven theory in practice before the results that today are offered to the world in the formation and development of human resources as the basic capital of society in its four levels of professionalization: the degree, high technicians, technicians and qualified workers.

In the documentary study accomplished from the consulted literature, it was significant that its authors did not explicitly define its concept of medical education, which imposes limits on the interpretations that trainers and trained can make and the science itself under construction, which still does not have sufficient consensus with the risk of taking the concept to its emptying of meaning and, to tautologies by means of which it is possible, in the social construct to substitute its meaning by the surname with which it is designated, from which they participate, act and produce not only the doctors.

The importance of the health care process in Cuba that are acquiring technological applications in the forecast and treatment of many diseases, resignifying epistemes underlying and offer internal logical coherence to Health Sciences and Medical Sciences so that its expression in the processes of formation and development of its professionals, so it is further inserted as consubstantial element with the Medical Sciences Education, in such a way that any foundation that is incorporated, any area that is updated within medicine and health, is immediately transposed as sustenance of the contents and organizational forms of medical education.

Epistemology is understood as "...product of a reflection on science, its foundations, its methods and its way of growth, it does not constitute a rational construction isolated in the heights of its scientific goal level but it is part of a network of relationships fluid, with their teaching and with their learning, some of which have an indisputable practical dimension". (1)

For the authors, the reflection about the possible transformations in medical education, the balances of their training cycles at undergraduate and postgraduate levels as well as its impacts, it requires more critical, meta-analytical views that must be based on a consensus that does not yet exist and is essential to provide information on the role of all participating institutions and their relative weight in the design of subsequent training policies.

Related to Humanism in Medical Education, fundamental episteme for the construction of an area of science, which is particularized to the training of health professionals in their different levels of professionalization, as workers, as technicians and as graduates in the different specialties - health technologist, nurses, doctors, and others - that make possible to accentuate the redefinition of the educational process with the same principles: from education to work, permanent and continuous training of human resources and the education in values, highlighting humanism, so important in the professions associated with human health.

Health professionals, with teaching functions, leading leaders in the construction of medical education from the practice with the guiding principle of education at work, have their origin in doctors, so then deepens in its role within of the conception of medical education.

The **Doctor** is recognized and in the document review which is a professional qualified by training and authorized by law to practice medicine. The essence of this kind of professional is its ability to find solutions to difficult problems for which there are no simple answers, as well as their competence to effectively handle medical



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situations in which two patients are never identical even if they have the same disease. This is what differentiates the professional -who must solve complex problems of a usually ambiguous nature through the contribution of clear solutions- from the highly qualified technician.

What is aspired of the doctors and is also common to technologists and nurses and other health professionals:

- Working in the search, and provision, of global medical competencies, and that of all personnel, who participate in health care, striving, so that they reach, the highest scientific and ethical standards, through Medical Education.
- Applying the methods for the promotion of health, learns to work in a team and acquires knowledge about the frequency and type of problems that can be found outside the hospital context , sometimes supported by the intersectoral approach .
- Standing out the development of communication that must have both to relate to students in their roles as teacher and tutor, as well as the different interventions made with the work team in the service that works and with the basic health team, as well as with patients and companions.
- Using methods and approaches as medical educators, based on the best available evidence (Research for evidences), in comparison with opinion-based education, for this this professional must take into account the degree of reliability of the available evidence, as well as its usefulness, possibility of generalization, degree of solidity, validity and relevance. It is this aspiration that takes place the fusion that occurs between methods and means of teaching and those of each profession associated with care - health intervention and education (promotion, disclosure, treatment and rehabilitation).
- Requiring a critical approach to literature and existing databases, as well as the identification of existing gaps, a space where the clinical and epidemiological methods merge to meet the demands of public health and transpose it to the teaching stage, with a dual interest for the academic and the assistance requires to possess a development in the informational and computer skills, as well as the necessary statistics for the processing of the information.

In 1966 a general model of what should be the doctor identified twenty - first century, seeing it as a trained professional to perform the following functions: (2)

- Provider of assistance required by the sick.
- Decisor, with the ability to define how and when to use the optimal technology, with an ethical foundation and considering the final benefit.
- Communicator, enabled for a promotion of healthy lifestyles and for population education in health.
- Community leader, mobilizer of wills and resources to solve health needs and social expectations.
- Manager, strategist, professional trained to work in teams.
- Educator, both in the community and in the training of qualified human resources.
- Researcher with a scientific profile aimed at analyzing and evaluating health problems and the corresponding strategies.
- Formulator of policies, trained in its planning, development and implementation.

It was considered then that a quality medical education, should guide their processes towards the achievement of these results, but excluded the other professionals who work in both training and development, and health care.

The practice of medicine, embodied in the doctor, combines both the science and the art of applying knowledge and technique to exercise a health service within the framework of the doctor-patient relationship. In relation to the patient, in the sanitary framework, links are similarly established with other health agents (nurses, pharmacists, stomatologists, psychiatrists, physiatrists, and other professionals) involved in the process.



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Medicine (from Latin *medicine*, derived in turn from *mederi*, which means 'cure', 'medicate') is the science dedicated to the study of life, health, illness and death of the human being, and involves exercising such technical knowledge for maintenance and recovery of health, applying it to the diagnosis, treatment and prevention of diseases. Medicine is part of the so-called health sciences. (3)

The practice of medicine, embodied in the doctor, combines both science and the art of applying knowledge and technique - call it technology prudence - to exercise a health service within the framework of the doctor-patient relationship. In relation to the patient, in the sanitary framework, links are similarly established with other health agents (nurses, pharmacists, psychiatrists, stomatologists, psychologists, and other professions) that intervene in the health care process .

Medical Education

One of the initial tasks to get into the definition of medical education, fundamental root for its identification as a science, was to establish an agreement on the concept of Medical Education. From the initial discussions it became clear that the concept goes beyond the mere instruction of residents in medical matters. In general terms, the concept of "education" is much broader than just the acquisition of knowledge. There are matters of knowledge in which the acquisition of knowledge grants a level of excellence in the preparation of an individual, as is the case of the preparation of a mathematician. In other cases, besides knowledge, skills are needed, as is the case with architects or mechanical engineers.

In the case of medicine, it happens that forming a good doctor requires, yes, the acquisition of the knowledge and skills necessary according to the specialty; but these two aspects are not enough. Since doctors work with human beings who not only become ill of an organ or system, but also "suffer" from disease (4) it is necessary that the doctor in their training acquires a humanistic preparation that allows them to understand the individual suffering from an illness, be supportive of your suffering and keep in mind that all the actions you take as a doctor should only be motivated by the need to cure, relieve and comfort the sick.

In medicine it is often said that a doctor must know how to heal, when this is not possible he must relieve suffering and when this is not possible he should be able to console. Actually, in current medicine, the epidemiological change that originates chronic pathologies, today's doctor must understand that in all cases, even in those that he is capable of healing, he needs to alleviate and also to console, to make the patient trust him. For this, something more than the use of modern laboratory and cabinet methods is needed, in this sense the other sciences have shown proper pathways of the dialectical pair health-disease, as it happens with nursing and its scientific method. Nursing care (PAE) or stomatology with the intervention in stomatology health, which shows a still confusing and complex path in the medical definition, if you want to conform in an inclusive way for all specialties, professionals, levels of care, technologies applied to health and services .

Therefore it is necessary that in the course of his clinical training - which in fact occurs during residency - is formed, is transformed into this subject capable of having the skills of healer and manifest it in the attitudes necessary to become this " healer "who uses modern clinical methods, but also, his training allows him for his abilities, aptitudes and humanistic attitudes to be this" healer ". Sorcerers, medicine men, "healers by faith", have neither the knowledge nor the skills of a doctor; but exploit this ability to communicate with the patient, to show solidarity with him, to make him feel solidarity and faith, elements that are overcome if the methods are fused and with it the epistemological positions of the clinical with the surgical, of the clinician with the epidemiological, of the medical and the nursing, trying to erase epistemic barriers that characterize them, showing a science that is not speculative, neither purely experimental or by evidence, but dialectically sustainable .

Medical Education is, in the first instance, the process in which an apprentice doctor not only acquires the knowledge -and the awareness that he must continue to renew them continuously-, the modern skills of his specialty, but this training as a doctor. This professional fulfills his mission better and makes humanity a well-trained doctor rather than a well-informed one.

The systematization made about the term of medical education, allows recognizing it in different meanings : (2)



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- Medical Education, is the process of training subordinate doctors, the dominant economic and social structures, in societies, in which it takes place.
- The Continuing **Medical Education** (EMC, *Educación Médica Continuada*) is the **educational** process of updating and continuous improvement, sustained and verified, carried out through a set of **medical** educational activities whose purpose is to keep developing or increasing knowledge, technical skills and relationships.
- The **medical education**, in its narrow sense, is considered as the process of teaching, learning and training of students, with a progressive integration of knowledge, experiences, skills, attitudes, responsibility and values so that they can finally practice medicine. It is evident that this definition continues to be content of only one type of professional - the doctor - and also does not refer to the intent of the university - company link, which in the context of this education is translated into the use of teaching stages from education in the job.
- **Undergraduate medical education or basic medical education** refers to the period that begins at the time the student enters the medical school and ends with the final examination of the degree. It ends with the granting of authorization for the practice of medicine, it is the more or less continuous period of learning after the period of basic training, which allows acquiring the skills for the exercise in the chosen medical specialty. With a more pragmatic purpose in this definition, attention is focused on a single step of the process: entry or entry, for which we consider that they have a reductionist position.
- **Continuing Medical Education:** The process of acquiring new knowledge and skills throughout their professional lives. Given that undergraduate and postgraduate training is insufficient to guarantee the competence of physicians throughout their professional lives, it is essential to maintain the skills of professionals, to correct deficiencies in skills and to facilitate that professionals are able to respond to the challenges posed by the rapid growth of knowledge and technologies, changes in health needs, and social, political and economic factors that accompany the practice of medicine. Despite having a broader sense in time for its pre and postgraduate vision, the reference of the health paradigm in health and identification only exclusive practice of medicine, make this definition criticize.

After assessing the coincidences in the systematization made to the previous definitions, the authors propose the following definition of medical education:

Medical Education: is the process of construction of new knowledge, the development of skills and values throughout the professional life of those who enter any of the careers associated with public health in its four levels of professionalization (worker, technician medium, advanced technical or bachelor's degree) established in undergraduate and postgraduate training, accentuated the permanent and continuous nature of education at work, and takes into consideration the social, political, legal and economic factors that accompany the national health system and the ministry of education, as well as the changing and growing demands of the population for their quality of life, which expresses during the process and the exit of any level, the humanism of health care training from a socio-medical paradigm .

Within the process of offering internal logical coherence of medical education as a science, different livelihoods appear in the **principles** of medical sciences, which are recognized as (5): "Education at work; Autonomy; Do not do evil; Professional Ethics and Beneficence ..."

However, in the investigations carried out in the process of construction of the Sciences of Medical Education, other principles have been insisted upon, namely: the principle of permanent and continued formation, the principle of humanism, among others, as well as some principles that they go into certain areas of medical education as a process and as a science in construction, these can be linked to the curricular design of training in the context of health or those related to the evaluation of training processes or effects and impacts.

This aspect has led many researchers to levels of intellectual production in different areas and lines of research, which promptly begin to resignify other processes, phenomena and categories that enter into conceptual "*crisis*". Such is the case of the work carried out by Fernández Sacasas (2014) entitled *The epistemological triangulation in the interpretation of the teaching-learning process of medicine*, in which he expresses that " Epistemology studies how the cognitive subject affects the object of knowledge. In medicine, the object of study is the health / disease process -and its attention- in the human being, on an individual (clinical medicine) and public (Public



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Health) scale (4), in this sense the authors emphasize that in this Reference is focused only on learning from the object of medicine and not the sciences of medical education, away from the object of the sciences of medical education: the training and development of human resources working in the field of public health.

In this context another of the important epistems to be studied are framed in the **features** that characterize the medical education that according to Dr.C. Oramas in the year 2012 and by Dr. Borges in 2014 is manifested in:

- "The development of the health sciences, nursing, medicine and stomatology, is related to the main achievements of human civilization.
- The transmission of knowledge has occurred in two fundamental ways through oral tradition and through teaching in schools, where The teaching "Tutorial" is the model that is most repeated in the development of medical education.
- The figure of the professor is related to knowledge and mastery of the art of teaching in professionalization for health professionals in pre-graduate and post-graduate education . " (6)
- "The class character of education has accompanied the development of the evolution of Higher Education in the different socioeconomic formations." (7)

Within this logical historical study are recognized the **premises** that have allowed to identify medical education as a process and as a science, in this sense is the identification of the institutions that provide Medical Education services, these are:

a) The university is with faculties and of medicine . The following are the names of these institutions that are used in different countries: School of Medicine; College of Surgeons; Medical Institute; Institute of Medicine and Pharmacy; Institute of Medicine and Surgery; Faculty of Medicine; Faculty of Medical Sciences; Faculty of Medicine and Surgery; Academy of Medicine or Medical Academy; University Center for Health Sciences; University of Medicine; Faculty of Medicine and Pharmacy, among others.

b) Scientific societies recognized by the World Health Organization (WHO); This includes non-governmental organizations and trade associations that represent medical colleges in many parts of the world.

c) Public or private health services that are teaching centers; and

d) Other institutions accredited by the International Medical Council (IMC), which has worked in the search, and provision, of global medical competencies, and that of all personnel, who participate in health care, striving, so that they reach, the highest scientific and ethical standards, through Medical Education. In 1972, the World Federation for *Medical Education* (WFME), the World Federation for Medical Education, was founded.

In this process of construction of this young science called medical education, the basics of health administration or management are related to efficiency and effectiveness, while taking the formative processes to the stages from education at work, is to calibrate the performance with the own objects of the profession: the patient and his accompanier. Below we refer to these livelihoods:

- Effectiveness refers to the "measure of the degree to which an intervention, procedure, regimen or specific services allow to obtain the expected results when applied in normal circumstances on a specific population. In the health field, it is a measure of the result of the application of health services that contribute to reducing the size of a problem or improving an unsatisfactory situation." (2), undergraduate and graduate students in the training process conduct surveys in the areas of health, visits to homes, educational talks, health interventions, among other activities that are not in the process of training and development as a health professional. exempt from guaranteeing their effectiveness, costs that are inferred from the guiding principle of education at work.

- Efficiency, deals with the "ability to properly perform a function or get a concrete result without wasting energy, resources, effort, time or money. Efficiency can be measured in physical terms (technical efficiency) or in terms of economic cost (economic efficiency). " (2) In this sense, the sciences of medical education, from the teaching scenarios, be it a guardroom, a discussion of cases, a visit to the room or actions from the intersectoral approach, should be concerned with achieving greater efficiency, when the same type and quantity of services are provided



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with a lower economic cost, when an unhelpful activity is replaced by a more useful one with the same economic cost, and when unnecessary activities are eliminated, this maxim must be present in each health professional who performs his teaching duties at any level of professionalization, which will manifest quality in services, an element that gives him the prestige of recognizing him as a teacher or as a tutor in the area assistance as a medical educator .

Medical educator

It is the professional who develops the educational process necessary to transform students into doctors, technologists, stomatologists, nurses, among other professions. Medical educators often associated generally to medical, epistemic custom that should be deleted when in practice it is increasingly common to participate in this task people with knowledge and qualifications in other branches of science.

What the health professional places as an educator is that capable of knowing how to do: clinical skills, practical procedures; exposed in their performance in the competencies for the study and treatment of the patient from a communicative vision that includes the companion; in addition to the development of the competences achieved in the promotion and prevention of health.

The shape of how the health professional addresses or perform their professional practice reveals the knowing exposed in the proper knowledge from basic, social and clinical sciences, as well as knowing how to be and live as shown in attitudes appropriate, ethical knowledge and legal responsibilities, for decision making and for clinical, surgical and educational reasoning and judgment .

Within this meaning as a medical educator, an important dimension when the formation is given in the construction of learnings with the tutor, apparently this training aspect is given naturally in its origins, however, the essence itself of the tutor exercise leads to this activity because there was a personal relationship continuously. With the organization and systematization of the training and specialization programs, the tendency in the role of the tutor to abandon or at least reduce their educational action may fall; can be tempted to think that everything can be solved only with the teaching in a residence, where it may seem, and it is not, unnecessary action and training of the tutor, that is why medical education as a science corresponds to deepen in the area of tutorial training and the development of information skills .

The contradictions determine the change and development of the processes or objects that investigate the theories that make up the Sciences of Medical Education, reflect their sense of theories under construction, that "... necessarily for their study and characterization of the behaviors, they had to be divided or fractionate them, this is how the dialectic of this process manifests itself, until socio-historical and socio-medical conditions exist for a integration in education at work, which will be related to health care and quality of life, between medical education and the holistic performance of health professionals, between the applications of health technologies and quality of the medical services, or between the human and the professional, expressed in the utility of the virtue of each individual. " (8)

The medical education sciences embraces in its qualities the model of the five "P", meaning that it is participatory, preventive, predictive, personalized and precise, a final epistle to its consolidation in practice as a science in construction.

CONCLUSIONS

The epistemological reflections made around the Medical Education Sciences, start from the definitions of medical education, which should be rooted with other theories and branches of science in the construction process as an ideal reflection of the essential relationships of their reality and, consequently, remain subject to development.

The principles, raised by education at work, the features and premises identified, as well as the foundations of management or health management, enables the recognition of medical education as a particular science associated with the purpose of training and development of resources human beings of the health sector, as the role of the medical doctor in his vision as a teacher and as a tutor in the healthcare area is vital from a socio-medical and epidemiological paradigm.



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Carta de declaración del autor o de los autores

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