

ORIGINAL ARTICLE

## Theoretical and methodological framework for monitoring and evaluating the impact of postgraduate medical studies

Concepción teórico-metodológica para el monitoreo y evaluación del impacto del posgrado en ciencias médicas

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### ABSTRACT

**Background:** assessing the impact of postgraduate education is essential for quality management of programs from a scientific perspective.

**Objective:** to describe a theoretical and methodological framework for monitoring and evaluating postgraduate medical programs that ensures quality management of postgraduate training.

**Methods:** qualitative research was conducted to distinguish the monitoring and evaluation processes, their interrelationships, and integration. Theoretical methods were employed, including analytical-synthetic, inductive-deductive, abstract-to-concrete, and systems modeling approaches. Empirical methods were used for data collection and processing. The results were triangulated across sources, confirming the need for the proposed framework. Specialists were consulted for their evaluation.

**Results:** the theoretical and methodological framework for monitoring and evaluating the impact of postgraduate programs at medical science universities takes into account the differences and complementarity between monitoring and evaluation processes, as well as their practical implementation. Among its distinctive features is the flexibility that allows a program to adopt modalities and methods deemed appropriate by the academic committee.

**Conclusions:** the theoretical and methodological framework provides impact measurement with a rigorous assessment of quality by gathering relevant information on the professional and social spheres involved; it constitutes an essential reference for refining the improvement plans for each iteration of the program.

**MeSH:** programs; knowledge management; inservice training; strategies; education, graduate; education, continuing; education, medical.

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## RESUMEN

**Fundamento:** apreciar el impacto de la educación de posgrado constituye una necesidad en la gestión de la calidad de los programas desde una perspectiva científica.

**Objetivo:** describir una concepción teórico-metodológica para el monitoreo y la evaluación de programas de posgrado en ciencias médicas que garantice la gestión de la calidad de la formación posgraduada.

**Métodos:** se realizó una investigación cualitativa que permitió distinguir los procesos de monitoreo y evaluación, sus interrelaciones e integración. Se emplearon métodos teóricos: analítico- sintético, inductivo-deductivo, ascenso de lo abstracto a lo concreto, enfoque de sistema modelación; y empíricos para la recopilación y procesamiento de la información, cuyos resultados fueron agrupados en la triangulación de fuentes y determinaron la necesidad de la propuesta descrita. Se consultó a especialistas para su valoración.

**Resultados:** la concepción teórico-metodológica para el monitoreo y evaluación de los impactos de los programas de posgrado en las universidades de ciencias médicas toma en cuenta las diferencias y la complementación entre los procesos de monitoreo y evaluación, así como su concreción en la práctica. Entre sus rasgos distintivos revela la flexibilidad que permite que un programa adopte modalidades y métodos que se consideren pertinentes por el comité académico.

**Conclusiones:** la concepción teórico-metodológica proporciona la medición de los impactos con una rigurosa apreciación de la calidad al acopiar información relevante sobre los ámbitos profesional y social implicados; constituye referente esencial para perfeccionar los planes de mejora de cada una de las ediciones del programa.

**DeSC:** programas; gestión del conocimiento; capacitación en servicio; estrategias; educación de posgrado; educación continua; educación médica.

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## INTRODUCTION

In Cuba, the Postgraduate Specialization Evaluation and Accreditation System (SEA-EP) was approved by Resolution 38/24 of 2024. Its general objective is to raise the quality of postgraduate specialization programs in higher education institutions, achieving high levels of social relevance and academic excellence. It is geared towards achieving the objectives, strategies, and goals of postgraduate education in Cuba. The quality standard expresses excellence as the essential benchmark that identifies the aspiration of the quality model for higher education in the Republic of Cuba and defines the quality assessment criteria that must be met to guarantee the highest accreditation level.<sup>(1)</sup>

Evaluating the impact of postgraduate education allows for projecting a new level of aspiration in accordance with the improvements achieved. This positively influences program accreditation and the certification of universities of excellence when strict control is maintained over this process.<sup>(2)</sup>

Postgraduate studies in the medical sciences constitute a process that unfolds within healthcare services throughout a worker's career. Its fundamental axes are the challenging and transformation of services by the workers themselves, as well as their conscious and active participation, with a high degree of motivation and commitment, in evaluating the quality of the professional activities they offer to the population.<sup>(3)</sup>

The Cuban medical university has the responsibility within society to train and maintain the continuing education and training of physicians, nurses, dentists, technologists, and all those working in the national healthcare system. This is achieved through postgraduate activities, aimed at raising the quality of specialized services and problem-solving within the framework of current scientific and technological development. Among its characteristics, postgraduate education focuses on quality management.<sup>(4,5)</sup>

In accordance with what was mentioned above, the objective of this article is to describe a theoretical and methodological framework for monitoring and evaluating postgraduate programs in medical sciences that guarantees quality management of postgraduate training.

## **METHODS**

A qualitative study was conducted at the Central University Marta Abreu of Las Villas in 2024. The systematization of theory, the design of an initial alternative, and the systematization and evaluation of practice allowed, from a broader perspective, the distinction between monitoring and evaluation processes, as well as their interrelationships and their integration into the formation of the scientific outcome, the object of study of this research: a theoretical and methodological framework for monitoring and evaluating postgraduate programs in medical sciences.

In processing the information, theoretical methods prevailed: analytical-synthetic, inductive-deductive, moving from the abstract to the concrete, systems thinking, and modeling. These methods allowed for the study of the parts and the whole of the process of measuring the impact of postgraduate training. Based on generalization, regularities were identified, moving beyond the level of the tangible and reaching the essential qualities of the components and their relationships to create an ideal representation of the object of study, expressed in a theoretical-methodological framework.

A diagnostic assessment of the current state of different strategies for evaluating the impact of postgraduate programs was conducted, revealing a predominance of empirical methods: group interviews, participant observation, and activity recording.

The expert panel evaluating the proposal included 18 postgraduate program coordinators. The indicators used to assess the theoretical and methodological framework were: relevance, novelty, quality of the theoretical foundation, clarity of the proposed objective, and logical correspondence between theoretical considerations and their practical application in the strategy.

## **RESULTS AND DISCUSSION**

The triangulation of the empirical methods used helped identify the shortcomings among program coordinators regarding their ability to conduct a regulated and uniform impact assessment. It also facilitated a distinction between monitoring and evaluation processes, their specific characteristics, and the possibilities for integrating them into the impact assessment process of postgraduate professional development.

The notion of quality management transcends evaluation and accreditation, as it involves diverse stakeholders and perspectives. However, the evaluation and accreditation of postgraduate programs are essential components of this management and of the sustainable development of postgraduate training for medical professionals.<sup>(6)</sup> This, coupled with the shortcomings identified in the diagnostic assessment, highlighted the need to design a

theoretical and methodological framework for evaluating and monitoring the impacts of postgraduate medical programs.

The theoretical and methodological framework, as a scientific outcome of this research, is conceived as a system of concepts and principles related to postgraduate studies and the monitoring and evaluation of their impacts on a personal, organizational, and social level. It is complemented by suggestions, procedures, and techniques for its implementation, which are integrated and specified in the strategy for each program.

The theoretical-methodological conception is understood as a form of systemic organization of scientific knowledge that, grounded in scientific findings, provides a specific explanation of the object of study and a guiding methodological framework for practice.<sup>(7,8)</sup> The theoretical and methodological aspects converge in its structure; it is innovative because it enriches both theory and practice in relation to the object of study.

The theoretical-methodological conception, as a scientific outcome, is based on the general foundations of postgraduate education and the higher education evaluation and accreditation system, as well as the legal framework that complements it. The following constitute fundamental concepts of the theoretical-methodological conception: a) monitoring, b) evaluation, and c) impact.

a) Monitoring is a continuous and systematic process for obtaining and analyzing information on progress toward achieving a program's goals and objectives and its impact. This is achieved through data collection, analysis, and use of information to reveal the strengths and weaknesses of its implementation and to contribute to problem-solving, performance improvement, success, and adaptation to changing circumstances.<sup>(9)</sup>

An academic postgraduate program constitutes a project because it involves planning a set of actions to be implemented and resources to be used to achieve specific goals and objectives. In this sense, monitoring the educational process is considered the systematic

process of information collection and analysis for tracking (supporting) a process, including the performance of quality dimensions within the higher education institution.<sup>(10,11,12)</sup>

The authors consider monitoring to be the systematic tracking of actions, activities, results, and products, which must be complemented by evaluation. Evaluation allows for judging the program's implementation and the extent to which it aligns with the planned strategy, the benefits it provides, and the decision-making process regarding whether to continue or suspend the implemented program. Consequently, an evaluation is fundamental to addressing the issues of effectiveness, efficiency, and ethics of what is being monitored.

b) Evaluation refers to the systematic analysis that determines whether a graduate program is achieving the goals and objectives stipulated in the design phase, or to what extent the program has generated the expected effects and impacts, as well as any unforeseen consequences, on the participants. Evaluations are typically conducted at the beginning, midway through, and at the end of a program.

Despite the differences between monitoring and evaluation, the objectives of both processes are very similar in that they provide useful information for making sound decisions, improving performance, and achieving planned results. This is why monitoring and evaluation are considered interrelated processes, even though they are theoretically separate.

Evaluation relies heavily on information reported and collected periodically; it provides data about the changes and transformations that take place in the individuals involved in graduate programs, as well as in their contexts of operation. Monitoring allows for tracking program performance over time, and its purpose is to help academic committees make decisions regarding program effectiveness and the efficient use of resources; evaluation provides the extent to which changes in results can be attributed to a program.

Monitoring and evaluation are interrelated but distinct processes. While monitoring is a continuous and ongoing process during program implementation, evaluation is conducted at established intervals, over longer periods, a distinction that some authors fail to

recognize.<sup>(13,14)</sup> In practice, both processes are closely related, although monitoring is more persistent and evaluation is more precise and periodic. The integrated combination of both processes facilitates the assessment of the impacts produced by graduate programs.

c) The literature offers various definitions of impact, referring to diverse spheres such as social, economic, environmental, political, technological, scientific, and educational; Particularly in the educational context, it is linked to processes, training and education, and is considered as a situation that produces significant and lasting changes, positive or negative, foreseen or unforeseen, in the lives of people, organizations and society.<sup>(15,16)</sup> There are references on the importance of measuring the impacts on the quality of postgraduate management related to training and academic education.<sup>(16,17)</sup>

In their proposal, the authors assume that measuring the impact of postgraduate education allows for the evaluation of the relationship between the planned actions and the professional performance of participants, the lasting and significant nature of the changes, and their influence on program quality management from a scientific perspective.

The need for quality management in postgraduate education at medical universities is positioned as a critical and conditioning factor for its development; therefore, it is a decisive and crucial issue for the effective management of their programs.<sup>(18,19)</sup> Quality management in education represents a set of processes, procedures, and managerial decisions that contribute significantly to ensuring that postgraduate programs meet the demands of students and society.<sup>(20)</sup>

#### Principles of the theoretical and methodological framework

- I. Comprehensiveness. It takes into account all variables that offer relevant information about the postgraduate program's development process and its social impact: students, graduates, faculty, and curriculum, from two perspectives: monitoring and evaluation. Monitoring identifies achievements, opportunities, and threats in a timely manner, allowing for necessary adjustments. Evaluation assesses



the quality of the professional's training and its impact on their work environment, revealing the program's efficiency, effectiveness, and sustainability.

- II. Systematicity. Impact monitoring and evaluation are carried out continuously, from the application process for enrollment in the program and for a period of time after the student graduates.
- III. Flexibility. This lies in the possibility of using a variety of resources and procedures that facilitate obtaining objective and valuable information.
- IV. Stakeholder participation. It must include the participation of all stakeholders from the outset and encompass the entire process.
- V. Continuous improvement. This implies that the evaluation of the results of systematic actions is taken into account in the program's improvement plan, its dimensions and indicators, and the application cycle of the instruments.

The Master's Degree Quality Standard (SEA-M) refers to the need for master's and specialization programs to consider, in their design, the projected impacts they will produce. These impacts must be achieved through influence on the processes of transformation and sustainable development of the region and the country; through the effect produced on the spiritual growth, professional performance, and social roles of graduates; and through the use of methods and means for determining these impacts, which in turn affects the quality of the program's development and local development.<sup>(21)</sup>

Methodology for the application of the theoretical-methodological framework

This constitutes a system of coherently articulated concepts and principles that are put into practice as a strategy to guarantee the monitoring and evaluation of the impacts of master's and specialization programs in medical science universities. The implementation strategy consists of four stages:

Stage 1. Planning the impact monitoring and evaluation process

- Objective: To plan the impact monitoring and evaluation process for the graduate program.

- The academic committee and each program define the objective of the monitoring throughout the entire process, from the beginning to the end of the edition, and the evaluation at three points: during the process (which begins when the call for applications is launched), at the end (when the edition is completed), and after a reasonable period of time has elapsed since the edition's completion (determined by the academic committee). Possible methods, techniques, instruments, formats, participants, and responsible parties are proposed.

Stage 2. Organization of the postgraduate program impact monitoring and evaluation process

- Objective: To ensure the necessary material and human resources are in place to determine the indicators and develop and select the methods, techniques, and instruments.
- Clarifications are made regarding the processing and analysis of the results by the committee members; individuals are assigned responsibility for specific variables to guarantee the systematic nature and control of the process.

Stage 3. Monitoring and measuring the impact of the graduate program through the application of methods, techniques, and instruments

- Objective: To apply the methods, techniques, and instruments and gather as much information as possible from the beginning of the process and at each of the defined monitoring and evaluation points—that is, during, at the end of, and for a period of time after the program's completion.
- The information gathering will take into account the various stakeholders and settings (contexts) that interact in one way or another during the development of the graduate program.

Stage 4. Processing and analysis of information collected during the monitoring and evaluation of the graduate program's impact

- Objective: To process information from various sources and at different points in the process regarding the previously established indicators for the objective analysis of said information, and to determine the regularities in the program's development (strengths and weaknesses).
- The processing and analysis of information is carried out systematically and requires ongoing evaluation so that the monitoring results reveal what was achieved and what was not, as well as assessing, during the evaluation process, what transformations occur in the students and how these impact their contexts of activity. All of this facilitates the necessary adjustments in the improvement plan.

The implementation of the strategy's actions takes into account the variables, their dimensions, and indicators, commensurate with their scope, to facilitate their verification.

The following variables were considered for monitoring: 1) Social relevance and 2) Infrastructure.

- 1) Social relevance. Dimensions: attention to institutional and organizational demands, program's connection to key sectors of the country, relevance to projects, links with other programs, adherence to the planned schedule and the development of student activities, and the development of the professors' methodological work.
- 2) Infrastructure. Dimensions: availability of scientific and technical information, access to diverse information sources, student access, the existence of facilities and furniture, the resources required for different activities, the organization of the calendar and schedules for in-person activities, and the legality of the preparation and development of documentation.

The use of methods such as document analysis, observation, accountability, questionnaires, and interviews provides results as evidence; these can be preserved in academic committee minutes, recordings, reports, endorsements, agreements, letters of request, etc.

The evaluation includes four variables: 1) student, 2) graduate, 3) faculty, and 4) curriculum.

- 1) Student. Two dimensions: a) intellectual and professional growth, and b) level of satisfaction.
  - a) Indicators: grades obtained by the student; their scientific output (expressed in participation in research projects, presentation of results, papers presented at conferences, publications), quality achieved in the presentation and defense of their thesis, and other indicators deemed relevant to the program's profile.
  - b) This will be explored primarily through student feedback, as well as evidence revealing their practices.
- 2) Graduate. Dimensions: a) professional performance and b) intellectual output.
  - a) Indicators: continued training, technical and process management roles, solutions to production and service problems, among others.
  - b) Indicators: impactful publications, participation in scientific events, leadership in university-healthcare institution partnerships, mentoring, and others.
- 3) Faculty. Dimensions: a) scientific output and b) professional prestige.
  - a) Indicators: publications, participation in events, and participation in research projects, among others.
  - b) Awards and recognitions, mentoring activities, participation in scientific organizations and bodies, scientific networks, and others.
- 4) Curriculum. Dimensions: didactic structure of the curriculum, theoretical foundation, explicit declaration of the organization of teaching, research, and innovation activities, interdisciplinary relationships, logical and pedagogical correspondence between the general objectives and those of the different academic activities, and the offering of required and elective courses as a complement to training.

The methods, techniques, and instruments for data collection will be selected appropriately in each case by the academic committees. Examples include document analysis, observation, accountability reports, questionnaires and individual and group interviews, the use of PNI, SWOT, and other scales, targeted visits, and triangulation of sources.

The application of these methods will contribute to building the evidence record. This systematic process comprises the minutes of the academic committee, reports of visits to healthcare facilities, accountability reports from designated members of the academic committee, videos, photographs, website publications, institutional endorsements, agreements, records of the output of scientific activity (publications, events, endorsements for the introduction of results, awards), visit reports, minutes of alumni meetings, self-evaluations of publications, and other elements that the academic committee deems important.

The work of the academic committee can be improved by considering the proposed strategy with its variables, dimensions, indicators, methods, and techniques, as well as the procedures for compiling the evidence record. This is intended to serve as a guideline, allowing each committee to add its own distinctive touch for better monitoring and control of postgraduate programs.

The specialists used the following categories to evaluate the program's design: Excellent, Very Good, Good, Fair, and Poor. The results showed that 94.4 % of the specialists rated all indicators as Excellent, while only 6.6 % gave a Very Good or Good rating, which is strong evidence of the high overall rating.

#### Scientific contribution

A theoretical and methodological framework is presented as a scientific result, based on the general principles of postgraduate education and the higher education evaluation and accreditation system, as well as the legal framework that complements it.

## CONCLUSIONS

A theoretical and methodological framework was designed from a coherent, systemic, and systematic perspective that provides for measuring impacts with a rigorous assessment of quality by gathering relevant information on the professional and social spheres involved. This framework was rated as Excellent by specialists for refining the improvement plans of each edition of the postgraduate programs.

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### **Declaration of interests**

The authors declare no conflict of interest.

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