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SYSTEMATIZATION OF PROFESSIONAL PRACTICES

# Innovative experience applying the Objective Structured Clinical Examination in the Medical Degree Program at Universidad San Gregorio de Portoviejo

## *Experiencia innovadora en la aplicación del Examen Clínico Objetivo Estructurado en el Programa de Medicina de la Universidad San Gregorio de Portoviejo*

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**ABSTRACT**
The Objective Structured Clinical Examination (OSCE) is a tool that has proven effective in assessing clinical competencies. This paper presents the main results obtained from the implementation of an innovative OSCE experience using high-fidelity simulators and standardized patients, integrating both quantitative and qualitative evaluation indicators. This examination serves as a prerequisite for access to pre-professional practice within healthcare institutions. The experience focused on medical students at the Universidad San Gregorio de Portoviejo in Ecuador, specifically those completing their clinical training in the fifth and sixth levels. The study highlights the applied methodology and the main challenges faced by the program in the continuous improvement of the assessment process. The results demonstrate that the OSCE is a valid and reliable assessment tool for distinguishing the level of clinical competencies achieved by students and emphasize the value of feedback provided by both students and faculty regarding the importance and objectivity of the results.

**Keywords:** Competencies; Objective Structured Clinical Examination; clinical competency assessment; medical students.

**RESUMEN**
El Examen Clínico Objetivo Estructurado (ECOE) es una herramienta que ha demostrado ser eficaz para evaluar competencias clínicas. Este artículo presenta los principales resultados obtenidos a partir de la implementación de una experiencia innovadora de ECOE utilizando simuladores de alta fidelidad y pacientes estandarizados, integrando indicadores de evaluación tanto cuantitativos como cualitativos. Este examen funciona como un requisito previo para acceder a la práctica preprofesional dentro de instituciones de salud. La experiencia se centró en estudiantes de medicina de la Universidad San Gregorio de Portoviejo, en Ecuador, específicamente aquellos que cursaban su formación clínica en quinto y sexto niveles. El estudio destaca la metodología aplicada y los principales desafíos enfrentados por el programa en la mejora continua del proceso de evaluación. Los resultados demuestran que el ECOE es una herramienta de evaluación válida y confiable para distinguir el nivel de competencias clínicas alcanzado por los estudiantes y resaltan el valor de la retroalimentación brindada tanto por estudiantes como por docentes en relación con la importancia y objetividad de los resultados.

**Palabras clave:** Competencias; Examen Clínico Objetivo Estructurado; evaluación de competencias clínicas; estudiantes de medicina.

## INTRODUCTION

We are living in turbulent times, where accelerated rhythms and immense global challenges take center stage. If these challenges are not addressed promptly, the risk to global sustainability will increase. In particular, the Latin American region is experiencing the deleterious impact of various phenomena, such as escalating violence, poverty, environmental degradation, marginalization, and decline across different economic and social contexts.

These disparities have been documented, for example, in the Oxfam Report (2024), which revealed that the wealth of the world's five richest men increased by 114% from 2020 to the present. Seven of the ten largest companies in the world are currently led or principally owned by billionaires. The 148 largest corporations earned profits amounting to 1.8 trillion dollars, 52% more than the average of the last three years, distributed generous dividends to wealthy shareholders while millions of people faced wage cuts and a declining standard of living.

In the health sector, the emergence and re-emergence of increasingly destructive diseases with widespread negative effects call for a redefinition of public policy and the effective management of health services, aiming to improve the quality of life for individuals, families, and communities at large.

The COVID-19 pandemic marked a pivotal moment in many areas of life, and higher education was no exception to its severe impacts. Therefore, redefining the training of health professionals is a critical challenge for human development, aiming to adapt educational approaches to the new demands of the workforce and society.

In this regard, the follow-up document to the Regional Conference on Higher Education in Argentina 2018 (CRES+5), held in Brazil in 2024 and specifically focused on the future of Higher Education in Latin America and the Caribbean, stated the following:

> Worldwide, education and science are increasingly oriented towards the One Health concept, which asserts that human health cannot be considered separately from animal health and environmental health. Together, and with the objective of One Health, it is possible to achieve Global and Planetary Health. (…) We know that the most vulnerable populations were the hardest hit by the pandemic, not only suffering social and economic losses but also severe impacts on human health, leading to the deaths of hundreds of thousands across our continent. This One Health approach will likely bring significant benefits in combatting future epidemics and preventing another pandemic tragedy from affecting populations and those most in need. (2004, p. 5)

These guidelines highlight the urgency of reconstructing the future landscape of higher education with a strategic and forward-thinking mindset, transforming it into a useful tool to confront the challenge of societal transformation. Embracing these directives requires, among other things, the development of academically and socially relevant programs, restructuring pedagogical approaches and teaching methodologies, effectively integrating substantive processes, continuously improving quality management, promoting research and innovation with ties to postgraduate studies, and relying on highly qualified faculty with professional and scientific experience who can contribute to the comprehensive training of professionals. This implies the development of essential competencies that ensure successful performance in the labor market.

Specifically, the competency-based education approach has been implemented in various professions, including the health sciences, in response to the demands of the new century, which call for a deeper awareness of the socio-cultural development of new generations. Competency-based education integrates essential elements such as knowledge, skills, aptitudes, and values, which are necessary to adequately perform tasks and achieve desired outcomes. This effort requires Higher Education Institutions (HEIs) to manage processes oriented towards the design and implementation of methodologies for assessing professional competencies.

According to Urbina (2020), competencies in the health field allow for effective training and the identification of errors, both theoretical and practical. Likewise, Champin (2014) and Gómez & Morales (2009) indicate that the evaluation of competencies must align with the graduate profile outlined in the curriculum and should be assessed objectively using conceptual, procedural, and attitudinal criteria. This enables educators to gain insight into students' learning trajectories relative to objectives and the construction of knowledge.

According to Brailovsky:

> The acquisition of a competency is not a success in itself but rather the acquisition of the habit of lifelong learning. Its assessment plays a vital role in helping physicians identify their learning needs. Ideally, competency assessment (what the student or professional is capable of doing) should provide sufficient insight into current performance, enabling adaptation to changes and the discovery and generation of new knowledge to globally improve their performance. (2011, p. 402)

This reinforces the need for accurate procedures to evaluate student competencies in a way that simulates real-life clinical situations encountered in medical practice. One such example is the Objective Structured Clinical Examination (OSCE).

To standardize assessment tools and enhance objectivity in measuring the performance of medical students, Dr. Ronald Harden and a team of professors from the University of Dundee in Scotland launched their first OSCE experience in 1975. This involved creating various stations with specific objectives, where evaluators used a pre-validated scale to rate students' practical skills.

Over time, authors such as Newble and Swanson (1988), Martínez et al. (2014), Trejo et al. (2014), and Pascual et al. (2015) have confirmed the OSCE's validity and reliability through high psychometric scores, making it the gold standard for evaluating clinical competencies globally, at both undergraduate and postgraduate levels.

According to De Serdio (2002), the OSCE allows for verification of professional competencies based on the different levels of Miller's pyramid, enabling assessment of what students "Know," "Know how," "Show how," and "Do."

Kamran et al. (2013) define the OSCE as an evaluation tool based on principles of objectivity and standardization, in which candidates rotate through a timed circuit of stations designed to assess clinical competencies in simulated scenarios. Martínez and Trejo (2018) describe it as an evaluation method that recreates a clinical encounter by simulating a patient with a specific medical condition based on a predefined case. Trejo et al. (2016) emphasize that the OSCE is a timed test structured as a circuit of stations resembling real clinical settings, with specific tasks to assess students' clinical competency. The use of multiple stations is justified by the "case specificity" phenomenon—performance in one clinical case does not reliably predict behavior in a different clinical scenario.

According to Trejo et al. (2014–2016), terminal OSCEs typically include 12 to 18 stations, depending on various factors such as the intended objectives, the number and type of aspects to be evaluated, the time allotted for each test, and the availability of resources.

Rubiano et al. (2007) note that each OSCE station generally lasts between 10 and 15 minutes and acts as an independent assessment tool. There are three types of OSCE stations: (a) stations with standardized simulated patients, where students interact as if in a clinical setting; (b) "bench" stations, where students interpret lab results and establish diagnoses and possible treatments; and (c) stations using simulators or trainers, typically used to assess technical or procedural skills, with an evaluator present to assess student performance. Each station provides students with an instruction sheet specifying the expected tasks. The competencies assessed include medical history taking, physical examination, doctor-patient communication, clinical report writing, clinical judgment, research methodology, interprofessional collaboration, differential diagnoses, technical skills, preventive actions, and legal-ethical aspects.

Today, the OSCE is increasingly used in formative assessments of health sciences students and even in certification exams for medical specialists. It has become a critical component of summative assessment in many countries and is required to obtain medical degrees. In Spain, its use is so widespread that a medical graduate is inconceivable without passing the OSCE. With appropriate adaptations, the OSCE is also being applied in fields such as law, sociology, and social work (Bogo et al., 2012; Trejo et al., 2016). In Ecuador, however, its implementation as an evaluation tool is still in its early stages.

Given this context, the objective of this study is to highlight the experience of applying the OSCE to assess clinical competencies among fifth- and sixth-level medical students at the Universidad San Gregorio de Portoviejo, Ecuador (USGP).

## METHODOLOGY

This systematization was carried out using a descriptive-interpretative approach aimed at reconstructing, analyzing, and evaluating the experience of applying the Objective Structured Clinical Examination (OSCE) in the Medical Degree Program at Universidad San Gregorio de Portoviejo (USGP). The methodology combined a documentary review of academic records with the collection of experiences from key stakeholders (faculty members, students, technical staff, and external observers), integrating both quantitative and qualitative information.

Data analysis was carried out through source triangulation (evaluation records, surveys, and observation reports), enabling the comparison of perceptions and results. This systematization methodology made it possible not only to reconstruct the experience but also to generate insights and lessons learned for replication and future enhancement.

## RESULTS AND DISCUSSIONS

The Medical Degree Program at the Universidad San Gregorio de Portoviejo (USGP) began its academic activities on October 19, 2021, welcoming students from various regions of Ecuador and abroad. The training process is oriented toward the development of professional competencies that enable students to perform in both healthcare and community settings. This includes implementing health promotion, disease prevention, treatment, and rehabilitation actions as contributions to improving the health status of the Ecuadorian population, based on the Integral Health Care Model (MAIS, by its Spanish acronym). The program places a

strong emphasis on the formation of values such as humanism, ethics, solidarity, and responsibility, which are essential for successful medical practice. In addition, it offers postgraduate programs and carries out research and community outreach projects in response to institutional and societal demands, within the framework of its social responsibility.

The program has a highly qualified faculty, consisting of national and international professionals with specializations in various fields of education and health. These faculty members possess extensive experience in teaching, research, and community engagement.

As part of the educational activities aimed at evaluating the development of clinical competencies, the OSCE was introduced in 2024 as a **summative assessment** at the conclusion of the courses *Clinical Practice I* and *Propaedeutics and Medical Semiotics* (fifth level), and *Clinical Practice II* and *Internal Medicine* (sixth level). To date, two editions of this exam have been conducted (2024 and 2025). It is also intended that this assessment exercise will prepare students for the OSCE that will be administered at the end of their studies, as one of the graduation requirements for the program.

The process developed is characterized by **its innovative and participatory approach**, with the following distinctive elements:

1. **Based on the clinical method,** in which students rotate through various stations that test their knowledge, skills, competencies, and values in managing a clinical case—from the medical interview and physical examination to the interpretation of complementary tests, formulation of a presumptive and differential diagnosis, and definition of a comprehensive treatment plan that includes health promotion and disease prevention approaches.
2. **Exploration of soft skills**, such as communication, emotional intelligence, adaptability, and problem-solving capacity.
3. **Integration of content** from other subjects within the same academic level or from previous levels.
4. **Use of high- and medium-fidelity simulators**, training devices, and standardized patients.
5. **Active participation of key stakeholders**, including faculty members, lab technicians, and external observers.
6. **Design of a methodological guide** to orient the process to be followed.
7. **Quality management of the process**, including planning, organization, implementation, and evaluation.

The starting point for designing the OSCE was the analysis of the curriculum and syllabi of the courses being assessed (*Clinical Practice II* and *Internal Medicine*), with emphasis on the objectives and learning outcomes, which in this case include:

a) identifying diseases by organ systems;
b) distinguishing signs and symptoms by organ systems;
c) preparing clinical histories for healthy and ill individuals by systems, and;
d) performing syndromic summaries and differential diagnoses, as well as defining the appropriate course of action.

To ensure the quality of the OSCE and its outcomes, a methodology was developed consisting of four interlinked and articulated phases. These phases allow for a management-oriented approach to conducting the various activities related to the evaluation process (Figure 1).

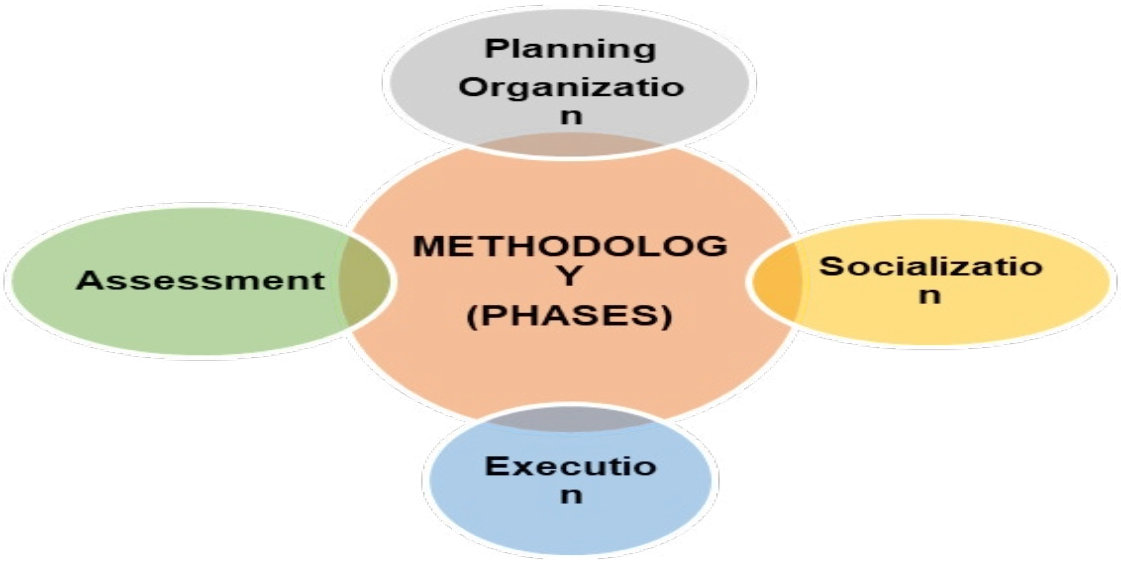


Figure 1. *Phases that comprise the methodology for developing the OSCE.*

Below are the essential aspects of each of these phases.

*A. Planning and Organization*

To conduct an effective OSCE, proper planning and organization are essential. Initial planning plays a key role in positively influencing the development of the subsequent stages, as any deficiencies at this starting point could negatively impact the overall quality and final outcomes of the process.

At the onset, it is crucial to establish an **Organizing Committee,** composed of selected faculty members and technical staff, who are assigned various responsibilities, including:

a) defining the principles and guidelines for the OSCE;
b) preparing a **methodological guide** for managing the evaluation process (planning, organization, implementation, and assessment of the OSCE);
c) conducting training for all involved personnel;
d) advising on the development of clinical cases and scoring rubrics;
e) ensuring the availability of materials and supplies for the stations, and;
f) organizing and implementing the evaluation process itself.

During this phase, it was necessary to define the **competencies to be evaluated in the students,** namely:

1. **Clinical history (anamnesis):** Perform a patient-centered anamnesis contextualized to the assigned clinical case.
2. **Clinical examination:** Identify the main signs and symptoms of various diseases through physical examination and document them coherently, clearly, and concisely.
3. **Complementary tests:** Interpret results of the most common complementary tests, in accordance with the presumptive diagnosis.
4. **Diagnostic reasoning:** Analyze the available information and justify the presumptive and differential diagnoses.
5. **Developing a management/treatment plan:** Justify the clinical approach and outline both hygienic-dietary and pharmacological treatment strategies.

An important component of this phase involved defining the **stations or scenarios** where the clinical competencies would be assessed. In this case, **five stations** were established to simulate real clinical situations in a controlled environment, based on the resolution of modeled clinical cases **(Figure 2).**

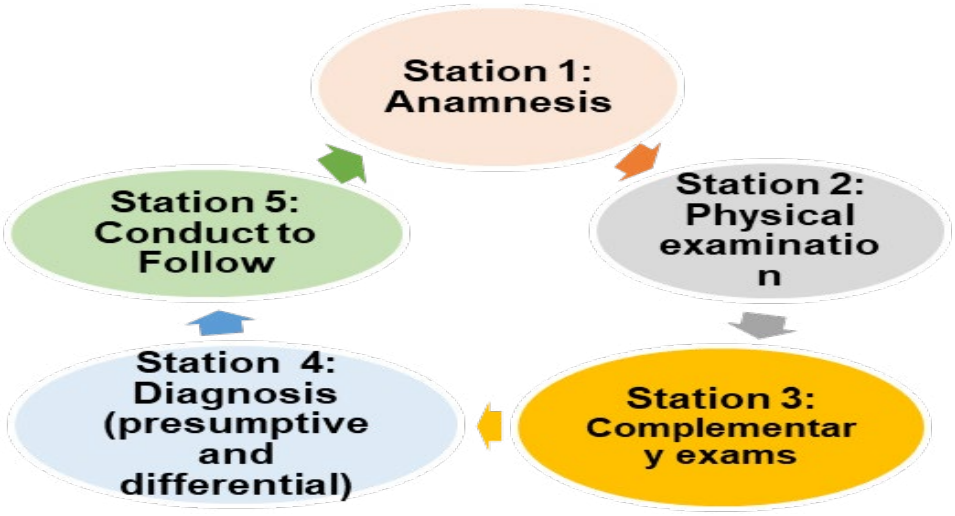


Figure 2. *OSCE Stations.*

As part of the organization of station-based activities, clinical cases were developed based on relevant conditions aligned with the learning outcomes and content of the subjects being assessed. The careful selection of clinical cases is fundamental to ensuring that the stations reflect realistic and challenging situations that students are likely to encounter in daily clinical practice.

The cases encompassed a wide range of pathologies studied from various perspectives in the subjects *Introduction to Clinical Practice*, *Clinical Practice I and II*, *Internal Medicine*, *Pharmacology*, and *Medical Imaging*, as well as integrative courses related to health promotion and disease prevention. Accordingly, the activities designed for each station are described below:

***Station 1: Anamnesis and doctor-patient communication***

In this station, the student interacts with a standardized patient to obtain a complete medical history, including medical, surgical, family, and social history, as well as the identification of relevant symptoms and signs. The student's ability to ask pertinent questions to guide an effective anamnesis, listen actively, establish good rapport, and document the information accurately is assessed.

***Station 2: Physical examination***

This station evaluates the student's ability to perform a focused physical examination on a standardized patient presenting with acute and/or chronic illnesses. Emphasis is placed on proper technique, thoroughness, and the ability to identify clinically relevant findings related to the assigned case.

***Station 3: Complementary tests – selection and interpretation***

The student is presented with results from complementary diagnostic tests (e.g., X-rays, laboratory studies, ECGs) and is expected to interpret them accurately to arrive at a diagnosis or formulate an appropriate management plan.

***Station 4: Presumptive and differential diagnosis***

Upon reaching this station, the student must justify a presumptive diagnosis based on differential reasoning, using the information gathered from the history, physical examination, and test interpretation.

***Station 5: Management plan***

This station evaluates the student's ability to develop a comprehensive and appropriate management plan for the patient, based on the presumptive diagnosis. The student must propose and justify a treatment plan, including pharmacological and hygienic-dietary measures, patient follow-up, and education—particularly focusing on health promotion and disease prevention. The student must demonstrate therapeutic decision-

making based on the available information, while also considering ethical and social factors in patient management.

### *OSCE Logistics and Infrastructure*

To ensure the effective development of the OSCE, all necessary components were identified and organized, including physical space, equipment, and supplies for each station. This included determining the specific locations for the stations, the simulators, training devices, and materials to be used, as well as the required technological support (audio and video).

The exam was timed using **traffic light systems** to indicate station progress: green for active evaluation time, yellow for transition warnings, and red for the end of the station. Additional systems were set up for calling students, monitoring evaluations, and announcing final scores.

An exam schedule was created for each day of the week, assigning one student group per day from **8:00 AM to 4:00 PM**. Each student rotated through the five stations over a one-hour period, with a maximum of **10 minutes per station,** and **2 minutes** allocated for transitions and orientation between stations.

Faculty members assigned to the stations were designated in advance (**two per station**). Evaluation rubrics were developed and finalized, and student materials were prepared, including a coded clinical case and specific instructions for each station.

### *Evaluation Criteria*

Each station was objectively assessed by the evaluation panels based on the following criteria:

a) Mastery of clinical competencies

b) Quality of procedural execution at each station

c) Clarity and confidence during performance

d) Appropriateness of responses to presented situations

e) Ability to make clinical decisions, perform differential and presumptive diagnoses, and define the management plan based on the assigned case

f) Appropriate use of the tools and resources available at each station

The **maximum score** for each student in OSCE was **10 points,** with **2 points allocated per station.**

### *Training and Preparation*

Another critical element of this phase involved training both evaluators and support staff, as well as preparing the students. Training addressed key aspects such as the purpose of the OSCE, the competencies to be evaluated, station protocols, coordination between stations, use of rubrics, and how results would be assessed from the perspectives of students, faculty, and external observers.

In the days prior to the exam week, a **pilot session** was conducted. This practical activity allowed the organizers to assess the readiness for implementation and to refine any logistical or methodological aspects to ensure a smooth and effective examination process.

## *B. Socialization*

The purpose of the socialization stage was to train students, faculty members, and support staff on key aspects of the OSCE that had been previously defined. In this regard, two socialization workshops were held with all students, in addition to the systematic preparation they received individually and in groups throughout the academic term. Methodological training sessions were also conducted for faculty, technical staff, and the external observer. Other communication channels were used, including social media and informative materials, to explain general aspects of the OSCE—its goals, characteristics, evaluation criteria, and activity schedule.

## *C. Implementation*

In the implementation phase, all activities previously planned and organized were carried out, with the primary objective of executing the OSCE and making necessary adjustments in real-time. This is the most operational stage and requires the active involvement of the organizing committee and all staff involved, who closely monitor the implementation to ensure that the process objectives are met. This phase is critical, as any decisions or changes made at this point directly affect the results.

*D. Evaluation*

The purpose of this phase is to assess the entire process and determine the degree to which the OSCE objectives were achieved (*meta-evaluation*). Evaluation activities play a crucial role in validating the effectiveness of the applied methodology and identifying areas for improvement. This, in turn, enables adjustments to be made to optimize future iterations of the OSCE and contributes significantly to decision-making and continuous process refinement.

To conduct the meta-evaluation, questionnaires were administered to students and faculty. In addition, an observation guide was used by external observers to generate a report on the development of the OSCE. The results were collectively analyzed by faculty members, who highlighted the main achievements and issued a series of recommendations aimed at improving the process in future editions.

Some of the most significant findings, from the perspective of the participating stakeholders, are outlined below:

- **Students:**The OSCE was perceived as a valuable tool for assessing and reinforcing their clinical competencies, allowing them to apply knowledge acquired throughout their studies in a controlled, practical environment. It helps prepare them for the realities of medical practice by engaging in key skills such as communication, clinical reasoning, and patient interaction. Additionally, the exam provided an opportunity to identify weaknesses and work on them. Although the experience was described as stressful and anxiety-inducing, students recognized it as a challenge that tests their resilience and ability to work under pressure. They also noted it served as *"motivation to realize they are on the right track."* Students recommended increasing the number of practice simulations to improve readiness for this type of examination.
- **Faculty:**Faculty members agreed that OSCE is a valuable tool for objectively, comprehensively, and consistently assessing the development of clinical competencies. They noted its utility in promoting critical thinking and placing students in simulated situations that reflect real-life professional scenarios. Suggestions included increasing the number of clinical cases and expanding training sessions for evaluators.
- **External Observers:** External observers concluded that the OSCE was successfully conducted, backed by thorough planning and organization that enabled proper coordination across stations, availability of necessary resources, adherence to the planned schedule, and effective student performance. They also highlighted the evaluators' expertise and objectivity during assessments.

## CONCLUSIONS

The Medical Program at Universidad San Gregorio de Portoviejo (USGP), in its commitment to comprehensive professional training, has adopted innovative pedagogical and didactic strategies aimed at monitoring and verifying student progress. In this context, the decision was made to introduce the OSCE as a valuable tool for assessing the development of clinical competencies among students completing the fifth and sixth levels, with the intention of later establishing it as a graduation requirement.

Grounded in the understanding that OSCE is a process that requires rigorous preparation, a structured methodology was developed, consisting of interrelated phases that integrate a series of actions to achieve specific objectives in both the implementation of the process and the analysis of its outcomes. This process-based methodology, centered on quality management, effective participation of key stakeholders, and the integration of innovative technological elements, grants the initiative a distinctively innovative character oriented toward continuous improvement.

The implementation of the methodology proved feasible, and the results demonstrated the achievement of the proposed objectives in both editions of OSCE (2024 and 2025), as validated by the positive feedback from students, faculty members, and external observers. The meta-evaluation of the processes carried out also enabled the identification of several areas for improvement to be considered in future OSCE implementations.

Given the relevance of the topic and the potential for further refinement in its conceptualization, design, implementation, and evaluation, this constitutes a promising area for future research, which could deepen knowledge and enhance best practices in this field.

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Los autores declaran no tener conflictos de interés.
**Contribución de los autores:**
Judith Galarza López y Eugenio Radamés Borroto Cruz: Conceptualización, curación de datos, análisis formal, investigación, metodología, supervisión, validación, visualización, redacción del borrador original y redacción, revisión y edición.