The Journal Club: A Postgraduate Educational Experience

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ABSTRACT

Introduction: Journal Clubs (JCs) are educational spaces where participants meet periodically to analyze and discuss scientific articles. One of the main challenges is ensuring that these activities are motivating, add value to training programs, and remain sustainable over time. Since 2009, a JC has been operating in the Department of Internal Medicine, and its most recent experience is described in this study.

Development: The period analyzed was from December 2023 to August 2024, involving 56 residents from the Department and fellowship trainees from 17 sections, with between one and four members per year. The format included 60-minute in-person meetings held every two weeks, during which a different scientific article was discussed each month. Coordination was carried out by a team composed of an expert in internal medicine, a research methodology expert —who remained constant— and at least two residents or fellows, who rotated monthly.

Each group selected an article, circulated it via email along with complementary educational materials and a guiding question set. Meetings emphasized interaction and debate. At the end of each session, a feedback form was distributed to gather input on the most valued aspects and areas for improvement.

Results: During the study period, 18 meetings were held, with an average attendance of 30 participants, most of them residents. The topics mainly focused on research methodology. Participants appreciated the variety of articles, the interdisciplinary perspective, and the collaborative work in small groups. Suggestions included the need for a more clinical approach and stratifying sessions according to knowledge level.

Conclusion: The JC was perceived as a valuable and engaging activity, sustained over time with good attendance. Although participation was not mandatory, it promoted the development of critical reading skills and strengthened the practice of evidence-based medicine. Improvements are planned for future editions.

Keywords: Evidence-Based Medicine, Evidence-Based Clinical Practice, Graduate Health Education Programs; Internship and Residency, Fellowships.

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Received: 19/12/2024 Accepted: 4/09/2025

DOI: http://doi.org/10.51987/rev.hosp.ital.b.aires.v45i4.430

How to cite: Peroni ML, Marciano S, Maccio AM, Pollan JA, Grande Ratti MF. The Journal Club: A Postgraduate Educational Experience. Rev. Hosp. Ital. B.Aires. 2025;45(4):e0000430

ISSN (en línea) 2314-3312

El Club de Lectura: relato de una experiencia educativa en posgrado

RESUMEN

Introducción: los Clubes de Lectura (CL) son espacios educativos donde los participantes se reúnen periódicamente para analizar y debatir artículos científicos. Uno de los principales retos es lograr que estas actividades resulten motivadoras, con valor agregado para los programas formativos y sostenibles a largo plazo. En el Servicio de Clínica Médica funciona un CL desde 2009, cuya experiencia más reciente se describe en este trabajo.

Desarrollo: el período analizado se extendió entre diciembre de 2023 y agosto de 2024, involucrando a 56 residentes del Servicio y a becarios de perfeccionamiento de 17 secciones, con entre uno y cuatro integrantes por año. La dinámica incluyó encuentros presenciales quincenales de 60 minutos, en los que cada mes se discutió un artículo científico diferente. La coordinación estuvo a cargo de un equipo conformado por un experto en Medicina Interna, un experto en Metodología de Investigación –que permanecía fijo– y al menos dos residentes o becarios, quienes rotaban mensualmente.

Cada grupo seleccionaba el artículo, lo difundía por correo electrónico con material educativo complementario y una guía de preguntas orientadoras. Durante las reuniones se priorizaron la interacción y el debate. Al concluir cada encuentro se enviaba un formulario para obtener retroalimentación sobre los aspectos más valorados y los que podían mejorar.

Resultados: en el período se concretaron 18 encuentros, con una asistencia promedio de 30 participantes, mayoritariamente residentes. Los temas se centraron en la metodología de investigación. Los asistentes valoraron la diversidad de artículos, el enfoque interdisciplinario y el trabajo en grupos pequeños. Entre las sugerencias surgió la necesidad de un abordaje más clínico y de estratificar las sesiones según el nivel de conocimientos.

Conclusión: el CL fue percibido como una actividad valiosa y atractiva, sostenida en el tiempo con buena concurrencia. Aunque la participación no era obligatoria, favoreció el desarrollo de habilidades de lectura crítica y fortaleció la práctica de la medicina basada en la evidencia. Se proyectan mejoras para próximas ediciones.

Palabras clave: medicina basada en la evidencia, práctica clínica basada en la evidencia, programas de posgrado en salud, internado y residencia, becas.

INTRODUCTION

Journal Clubs (JCs) are educational forums in which members meet regularly to discuss scientific papers with the aim of improving their critical reading skills and their practice of evidence-based medicine (EBM)[1-3]. Over the years, they have become so relevant that today they are an integral and essential component for the accreditation of many training programs in the health sciences[4].

Several authors agree that participating in a JC is an effective way to become familiar with fundamental concepts of epidemiology, methodology, and research[5]. For this reason, since 2009, the JC has been included in the Postgraduate Training Program for Residents and Clinical Fellows of the Department of Internal Medicine. A residency is a postgraduate training program in which newly graduated physicians specialize in a given area (e.g., Pediatrics, Internal Medicine, etc.) through supervised clinical practice in a hospital[6], whereas fellowships are post-residency programs designed for specialists who wish to deepen their expertise in a specific field (e.g., Neonatology within Pediatrics or Hepatology within Internal Medicine)[6]. One of the greatest challenges of the JC over the years has been to design it in a way that is engaging, educational, sustainable, and capable of being maintained over time[5]. Various publications have identified key factors that contribute to successful design and planning[2,7-9]. For instance, it is recommended to integrate the JC into training curricula and make it mandatory, to appoint a committed leader responsible for coordination, and to establish clear objectives for the activity. Likewise, the literature suggests holding at least four meetings per year, scheduling them in advance (preferably during lunchtime), selecting original and relevant articles, and promoting interaction and debate among participants-ideally in small discussion groups[5].

Although multiple approaches exist for implementing a JC and assessing knowledge acquisition as a result of participation, there is limited evidence regarding the most effective strategies to maximize its educational value[5].

The aim of this paper is to describe our educational experience with the JC implemented within the residency and fellowship programs of the Department of Internal Medicine.

DEVELOPMENT

This article presents a faculty development strategy carried out within the framework of the Universidad Hospital Italiano de Buenos Aires (UHIBA), which currently offers eight undergraduate programs, more than thirty postgraduate programs, and oversees over a hundred in-service training programs across its healthcare network-including two hospitals (Central and San Justo campuses) and twenty-three peripheral centers.

The Department of Internal Medicine has a total of 56 residents (across four years of training) and 17 divisions, each with between one and four fellows per academic year-all of whom are participants in the JC. Although originally designed for residents and fellows, this educational activity occasionally included undergraduate students (from the University) and external trainees rotating through various divisions such as Allergy, Pain, Epidemiology, Pharmacology, Research, Geriatrics, Hematology, Hepatology, Hypertension, Infectious Diseases, Home Care, Pulmonology, Nutrition, Oncology, Palliative Care, Rheumatology, and Toxicology.

The pedagogical structure consisted of a 60-minute, in-person meeting held every two weeks. The day, time, and venue were determined based on the availability of potential participants and presenters, and once established, remained fixed throughout the academic year. Attendance was recorded at every meeting, even though participation was not mandatory. Reminder emails were sent a few days before and on the day of each meeting (Fig. 1).

A different article was discussed each month, meaning that the same paper was analyzed in depth over two consecutive sessions. Article selection was carried out by the coordinating team, which could choose to focus on either methodological or clinical aspects. The choice was made at least one month in advance to allow for review by the methodological team and for dissemination. Along with the announcement, participants received additional reading materials on the selected topic and a set of guiding questions to facilitate individual and reflective critical reading of the article (APPENDIX).

Each session was coordinated by a team of at least four members, composed of: (a) a subject-matter expert from the division responsible for that month; (b) a methodological expert from the Internal Medicine Research Area (AIMI), who provided longitudinal methodological support; and (c) two residents or fellows who presented and/or led the discussion. The methodological expert ensured continuity between sessions, while the remaining team members rotated monthly.

During the design of the activity, it was decided to divide each article into two sessions. The first focused on the introduction, research question, objectives, and methods, while the second addressed the results, discussion, and final conclusions. Regarding the one-hour organizational structure (Fig. 2), the first 10 minutes were devoted to an introductory segment, which included a brief review of the previous JC session, clarification of any remaining questions, and resolution of pending issues. Participants were then randomly divided into small groups of 5 to 10 members, with each group assigned a different section of the article. Approximately 20 minutes were allotted for small-group work. The following 20 minutes were used for a plenary discussion, during which each group presented its conclusions, fostering collective debate and reinforcing methodological concepts. In the final 5 to 10 minutes, key ideas were reviewed, and the topic for the next session was announced. The main focus was placed on interpreting the study's core findings (e.g., measures of association or survival curves) in order to help participants learn how to translate research results into patient –friendly language– thus enhancing physician-patient communication and shared decision-making.

After each JC session, an anonymous online survey was distributed to participants to gather feedback on positive aspects and opportunities for improvement. The survey included both open-ended questions and Likert-scale items ranging from 1 to 5 (1 = Not useful/clear; 5 = Very useful/clear), covering aspects such as content, instructor performance, and other pedagogical elements.

During the final session of the August 2024 academic cycle (as the last group of trainees was admitted in September 2024), an exploratory qualitative assessment was conducted on general research concepts. Using a Google Form®, participants completed the questionnaire either voluntarily in person (synchronously) or online (asynchronously). The questions explored participants' perceptions of the importance of critical appraisal of scientific articles, their previous research experience, and their opinions about certain statements-both subjective and true/false.

In addition, the assessment addressed participants' knowledge of grey literature, strategies for drafting the introduction of a research protocol, the most commonly used and appropriate bibliographic databases for literature searches in the health sciences, and the structure of scientific manuscripts (e.g., IMRaD). It also evaluated their understanding of different types of research questions, the essential characteristics of study objectives, and possible methodological approaches for achieving them. Finally, participants were asked to identify the key factors they considered most relevant when selecting a scientific journal in which to publish research findings.

ANALYSIS OF THE EXPERIENCE

Teaching perspective: rationale, scope, and limitations

Carrying out the CL represented a major pedagogical challenge. Although its initial structuring was laborious, it was considered an outstanding debt based on the needs inherent to the Service's educational programs. However, its implementation faced several difficulties, mainly those related to promoting active participation (within the context of an already overloaded work schedule) and ensuring sustained collaboration over time (not only among participants, but also among section specialists).

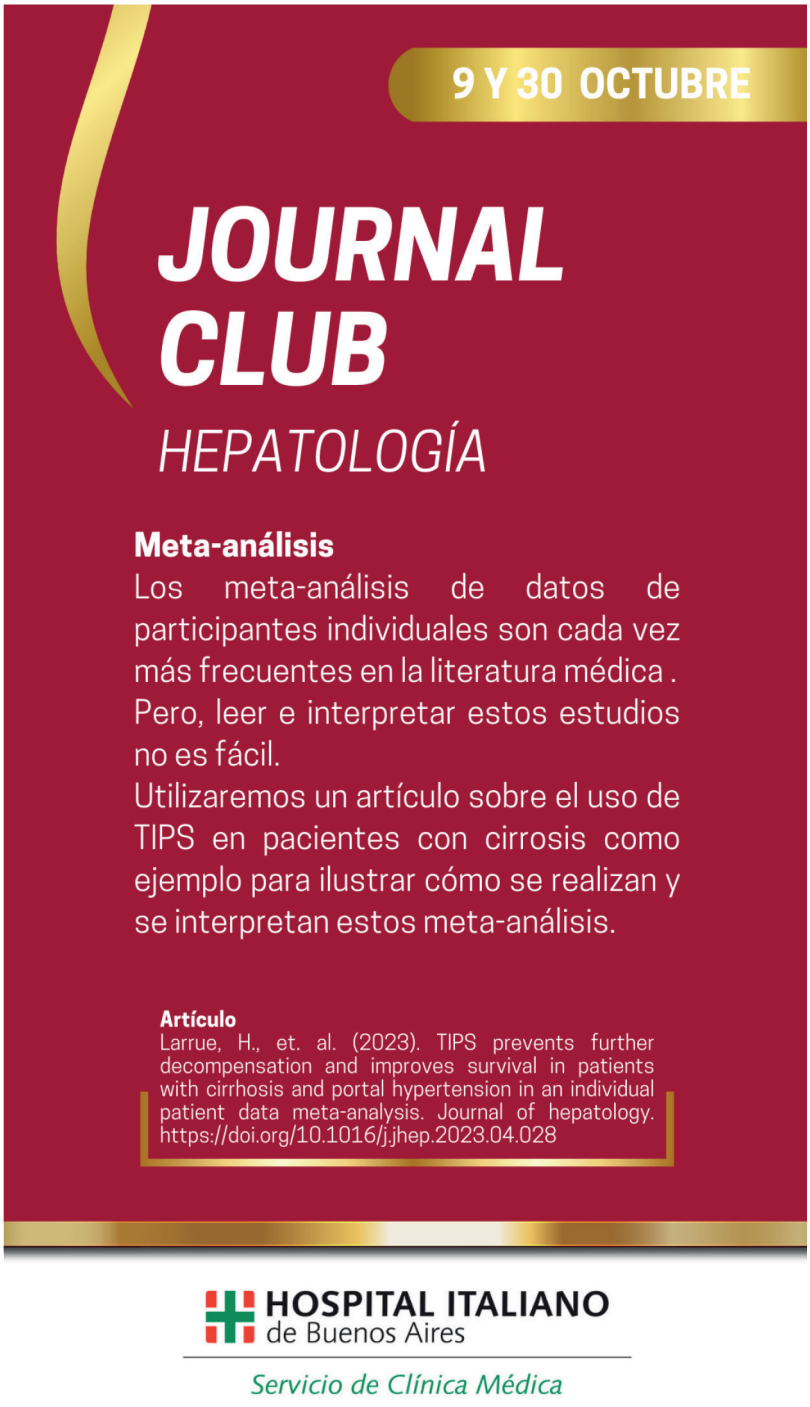

Figure 1. Flyer of the Journal Club (example from October 2024), used as a reminder and sent twice (one week before and again on the morning of the session) by email to potential participants.

Figure 2. Organizational dynamics of the educational activity (1-hour duration for each in-person session).

Between December 2023 and August 2024, 18 sessions were held, all of them in person. Although it was understood that this decision implied unequal participation (e.g., excluding residents rotating outside the institution), there are significant advantages that may be difficult to replicate in virtual or hybrid formats (e.g., in-person attendance fosters direct and dynamic interaction, strengthens social and face-to-face collaborative skills, and reduces external distractions and technical issues).

The average attendance was 30 participants per session, ranging from a minimum of 8 to a maximum of 54. Most attendees were residents, while fellows, students, and external rotators participated more irregularly (Table 1). Attendance was highest in the initial sessions (24 to 56 participants), showing a declining trend in the later months (8 to 14 participants). This may reflect an initially high level of motivation that was later affected by the fatigue typical of prolonged activities, as reported in other training experiences[8]. Nevertheless, continuous reflection took place, and different strategies were implemented to enhance intrinsic motivation and reduce absenteeism.

Thus, the articles were selected by the assigned team according to their interests[5]; a different article was analyzed each month, divided into two sessions (to allow for in-depth exploration); and the material was distributed well in advance so everyone could read it (or at least have access to it). The day, time, and place of each meeting were agreed upon according to the majority's availability and fixed over time to avoid confusion. Participants were allowed to bring food and drinks to make the activity more relaxed and feasible[10]. Efforts were made to ensure that both residents and fellows had protected time to attend and received political support from their supervisors.

Undoubtedly, institutional support from the Head of Service, who encouraged active participation from the different Sections, was a key facilitating factor. Despite all these considerations, the healthcare workload—always a top priority and a competing demand—did not always allow everyone to attend, and even less so to do so consistently (e.g., absences expected after on-call shifts, vacations, leaves, external rotations, and/or extramural healthcare duties).

Efforts were made to appoint responsible moderators with adequate training and experience to guide the group dynamics, ensuring that the sessions were productive and enriching. Eight of the 17 Sections participated (Hepatology, Geriatrics, Rheumatology, Epidemiology, Infectious Diseases, Hematology, Pharmacology, and Research, respectively). Working in small, randomly formed groups and arranging participants in circles were intentional strategies aimed at fostering a workflow based on active participation and the exchange of ideas among colleagues.

Table 1. Characteristics of the 18 meetings held in the Department of Internal Medicine during the 2023–2024 academic year

Date	Section in Charge	Participants (^/*)	Topics discussed
December 2023	Hepatology	39 (15/24)	Critical reading of scientific articles: what it involves, its importance, and its application in clinical practice. The research question: importance of identifying the study question and objectives, characteristics of the question, types of questions.
December	Hepatology	47 (15/32)	Practical application of the concepts addressed in the previous session. Group work identifying the type of research question in different articles.
January 2024	Internal Medicine Residency	27 (9/18)	Introduction: characteristics and information provided. Materials and Methods: information provided. Types of research studies and designs. Cohort studies: definition, types of cohorts, advantages and disadvantages of retrospective cohorts, what a dynamic cohort is. Target population, accessible population, and sample.
January	Internal Medicine Residency	42 (13/29)	Frequency measures: prevalence, incidence, cumulative incidence, and incidence density. Stratification and standardization.
February	Geriatrics	39 (12/27)	Quasi-experimental studies.
February	Geriatrics	24 (11/13)	Relative risk – Hazard ratio.
March	Rheumatology	36 (12/24)	Case-control studies: definition, advantages, disadvantages. Sample size. Bias.
March	Rheumatology	27 (13/14)	Types of variables. Confounders. Sensitivity and specificity. ROC curves.
April	Epidemiology	40 (17/23)	Measures of effectiveness. Population impact measures. Incidence density and cumulative incidence. Cost-effectiveness analysis.
April	Epidemiology	31 (7/24)	Qualitative studies.
May	Infectious Diseases	54 (20/34)	Non-inferiority studies: advantages and disadvantages. PICO question.
May	Infectious Diseases	31 (14/17)	Non-inferiority studies: advantages, disadvantages, validity of results, interpretation of results, non-inferiority margin, bias, and confounders.
June	Hematology	11 (7/4)	Type of research study-Advantages and disadvantages of retrospective cohorts-Bias-Types of variables -Types of populations.
June	Hematology	13 (11/2)	Frequency measures. Cumulative incidence and incidence density. Fine and Gray. Censored data. Time-to-event analysis. Competing events.
July	Pharmacology	14	Clinical trials
July	Pharmacology	8	Clinical trials
August	Internal Medicine Residency	14	Is it possible to conduct research using secondary and local data? How to search for journals indexed in PubMed
August	Internal Medicine Residency Clínica Médica	39 (1/38)	Final qualitative evaluation

Participants (^/*):
^ = *Fellows*
* = Residents

Regarding article selection, the approach to content was always primarily methodological (not necessarily clinical-assistance oriented), without losing sight of the goal of critical reading and practical application. This was also previously agreed upon. Throughout the cycle, the following topics were addressed: what critical reading of research articles entails; its importance for health professionals; identifying the research question and study objectives; different types and designs of research studies (their respective limitations and strengths); types of populations (target, accessible, and sample); measures of frequency and association; basic concepts of stratification and standardization; types of variables; bias and confounding; sensitivity and specificity; time-to-event; and competing events (see Table 1). In this regard, evidence supports the inclusion of formal concepts of basic epidemiology and statistics, as well as the principles of Evidence-Based Medicine (EBM)[1,2,4,11]. Consequently, a large part of each meeting was devoted to reviewing basic theoretical concepts of research methodology, while discussing real-world cases.

Student perspective: strengths and weaknesses

According to the participants themselves, the opportunity to analyze articles in depth, the variety of topics, interdisciplinary interaction, and the space to raise questions were all positively valued. Consistent with the literature, since technology generates an overabundance of information, critical reading provides tools to develop strong critical appraisal skills and methods to organize the information encountered[12].

Regarding the session format, participants appreciated the theoretical approach to applied topics, the use of guiding questions to facilitate reading, and small-group discussions. However, among the suggested improvements were focusing on a single research topic per session, summarizing key messages at the end, including more statistics classes, selecting articles based on clinical (rather than methodological) topics, and developing collaborative research projects arising from the discussions of interest (as a starting point for new ideas or future work).

A few participants noted that the large number of attendees could inhibit active participation and suggested forming groups by personal choice (as it is easier to speak among peers or friends) or organizing them by training level, acknowledging the existing heterogeneity depending on the year of training. They thus proposed creating separate spaces for residents and fellows. However, the pedagogical strategy was intentionally designed from the teaching standpoint to promote integration across different generations and encourage teamwork –regardless of prior acquaintance or interaction– as part of the hospital's organizational culture.

The topics covered were especially valued. Participants highlighted the relevance of these tools for evidence-based clinical decision-making, reaffirming the importance of integrating such components into medical education[13]. The literature supports that the ability to critically interpret scientific research is essential for effective, judicious, and up-to-date professional practice[1,2,4,11,14-17].

Final evaluation of the educational experience

Only 21 evaluations were obtained from participants for the end of the academic cycle, mostly from residents (Table 2). All agreed that not all publications are of good quality. Sixty-seven percent believed that critical reading is important for assessing the scientific quality of publications, making evidence-based clinical decisions, stimulating critical thinking and reflection, and identifying methodological limitations (which could lead to the application of biased or incorrect results).

Regarding the bibliographic databases most frequently consulted for searches, all participants reported using PubMed/MEDLINE®, while 80% also used Cochrane®. Concerning ethical aspects, 90% considered that research projects require approval by a review committee, and half stated that all research studies require informed consent.

Fifty-two percent reported having participated in research projects, and only 14% stated they had not yet published. Finally, regarding the most relevant factors to consider when selecting a scientific journal for publication, participants mentioned the thematic alignment of the journal with the article and its ability to provide novel information to the community. Other relevant aspects included impact factor, indexation, prestige, and reach. Credibility, quality, and dissemination were also cited as important factors. Some participants expressed a preference for indexed, peer-reviewed journals, and for publications in English.

Interpretation

Non-mandatory evaluation surveys have several methodological limitations that may affect the validity and generalizability of their results:

a) **Information or self-selection bias** – when respondents are individuals with greater interest, time, or particularly positive or negative opinions, which may not represent the entire group;

b) **Low response rate**; and c) **Limited comparability** – results may not be comparable across different times or groups if the sample changes significantly between evaluations.

This information underscores the importance of carefully analyzing our findings. Additionally, it would have been interesting to explore the characteristics of the respondents, since the stage of training (early vs. final period) could influence factors such as time availability, experience, workload, and on-call duties — all of which may facilitate or hinder participation and perception, potentially introducing information bias. In a future survey, it could be useful to examine attendance and

Table 2. Evaluation conducted during the final meeting (August 2024). The questions and their corresponding answers are listed

Question(s)	Responses (N: 21)
I am (#)	
Resident	17 (81%)
Fellow	3 (14.3%)
(Student/Rotating trainee)	1 (4.7%)
Why do you think critical reading is important for health professionals? (*)	
• It allows for the evaluation of the scientific quality of publications	18 (85.7%)
• It helps make informed decisions based on solid scientific evidence (with clinical applicability)	20 (95.2%)
• It stimulates critical thinking and reflection (essential skills for clinical practice)	18 (85.7%)
• It allows the identification of methodological limitations, preventing the application of potentially biased or incorrect results	14 (66.7%)
Have you had the opportunity to participate in the following types of publications (as author or co-author) of (*):	
Original Research (Cross-sectional, Cohort, Case-control, RCTs)	11 (52.4%)
Narrative Review	2 (9.5%)
Systematic Review	4 (19%)
Meta-analysis	0 (0%)
Letter to the Editor	2 (9.5%)
Case Report or Case Series	8 (38.1%)
None of the above (I have not published yet)	3 (14.3%)
What do you think about the following statements?	
Unpublished research exists	
False	11 (52.4%)
True	10 (47.6%)
All publications are high-quality studies	
False	21 (100%)
True	0 (0%)
The IMRaD structure is a standard format for organizing scientific manuscripts meaning "Introduction, Methods, *Results, and Discussion"*	
False	0 (0%)
True	21 (100%)
All studies must have objective(s)	
False	2 (9.5%)
True	19 (90.5%)
All studies require Informed Consent	
False	10 (47.6%)
True	11 (52.4%)
All studies require Ethical Approval	
False	2 (9.5%)
True	19 (90.5%)

(continue)

(Continued)

Question(s)	Responses (N: 21)
"Grey literature" in Health Sciences includes (*):	
Technical Reports (e.g., prepared by institutions)	15 (71,4%)
Theses and Dissertations	15 (71,4%)
Working Papers (e.g., Institutional Protocols)	11 (52,4%)
Conference Proceedings (e.g., abstract books and papers presented at congresses)	10 (47,6%)
Government Publications (e.g., National Clinical Practice Guidelines	8 (38,1%)
What recommendations do you think are key for writing the Introduction of a Research Protocol? (*)	
Conduct a detailed literature search of available information on the research question or hypothesis	15 (71,4%)
The literature search should focus on recent articles (ideally less than 5 years old) and include full-text review (not only abstracts)	13 (61,9%)
Provide contextualization that emphasizes why the topic is important and relevant	18 (85,7%)
Identify the knowledge gaps that your study/idea/proposal aims to address	10 (47,6%)
The writing should be clear, coherent, and effective in establishing the rationale and direction of your research	19 (90,5%)
Which bibliographic databases can you consult for writing a Research Protocol? (*))	
PubMed/MEDLINE	21 (100%)
LILACS	11 (52,4%)
Scopus	6 (28,6%)
Web of Science	4 (19%)
Cochrane	17 (81%)
Google Scholar	10 (47,6%)
Other(s)	4 (19%)
Research questions can be (#)	
Descriptive	0 (0%)
Analytical or Comparative	2 (9,5%)
All are correct	19 (90,5%)
What attributes should objectives have? (*)	
Specific: avoiding ambiguities and being as detailed as possible	19 (90,5%)
Measurable: quantifiable	17 (81%)
Achievable: realistic, feasible, attainable	16 (76,2%)
Relevant: must be significant and pertinent to the context	17 (81%)
Time-bound: should include a defined, timely, and clear time frame	15 (71,4%)
The methods that can be used are (#)	
Quantitative	2 (9,5%)
Qualitative	2 (9,5%)
Mixed	1 (4,8%)
All are correct	20 (95,2%)
(*) You may select more than one option (#) Responses add up to 100% as they are mutually exclusive	

participation levels according to the participants' year of training.

Finally, the evidence defines that *"a successful Journal Club is one in which residents develop the competence to evaluate the scientific literature in search of evidence-based answers that can be applied to clinical questions"*[18]. The concise ROOTs® method (Relevance, Observe validity, Obtain clinically significant results, and Translate results into clinical practice) was developed to simplify and provide structure to any Journal Club process[19]. However, our assessments were carried out using a multifaceted approach –attendance records, post-session evaluations, and a final evaluation– in alignment with the literature[20].

In general terms, our lessons learned emphasize that successful and effective Journal Clubs depend on careful planning, structured implementation, and an ongoing process of adjustment and improvement. We also identified the usefulness of adding a WhatsApp reminder, given that younger participants do not regularly check institutional email.

To conclude, this academic cycle revealed some challenges yet to be resolved:

a) the lack of protected time (to read in advance or even to attend the activity), and

b) the fact that not all section heads perceive it as an academic necessity, leading to incomplete institutional support.

Undoubtedly, these challenges represent a new opportunity for improvement in the teaching of Evidence-Based Medicine in the future. In a hospital setting, this could take the form of brief, time-efficient, and routine interventions - for instance, at the patient's bedside or during ward rounds, among other possibilities.

CONCLUSIONS

We believe that the implementation of the Journal Club (JC) in the curricular program of residency and fellowship training is a valuable tool for professional development, as it contributes to building essential skills for competent and up-to-date practice. At the same time, it fosters the habit of critically reading scientific articles, encourages the practice of Evidence-Based Medicine (EBM), and promotes clinical research.

Among the main strengths of this educational experience are: the prioritization of debate, the exploration of improvement-oriented opinions, and the promotion of interaction and socialization among young professionals who, although belonging to the same institution, in many cases do not know each other and have little contact with experts or mentors from other sections.

From a pedagogical and educational perspective, despite questions regarding how to sustain long-term participation, measure the real impact on reading and critical appraisal habits, and adapt the content to the participants' evolving needs, we believe that this experience provided valuable tools worth sharing, as they could be replicated in other settings.

Acknowledgments: To Federico Angriman and Bruno Ferreyro, who returned from the MECOR Program (Methods in Epidemiologic, Clinical & Operations Research) in 2009 (Botucatu, Brazil) and were pioneering founders of this educational activity within the Internal Medicine Residency. To Diego Giunta, who supported, accompanied, and kept the flame

Conflicts of interest: The authors declare no conflicts of interest related to the content of this article.

Funding: The authors declare that this study received no external funding.

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FALTA LA TRADUCCION DEL ANEXO