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EDITORIAL

# Key points in constructing a scientific research question

*Pontos-chave na construção de uma pergunta de pesquisa científica*

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The formulation of a well-defined research question is crucial for the success of any scientific study, as it guides the entire investigative process—from methodology to data analysis. The research question serves as the foundation of scientific investigation, defining its structure, methodological approach, and relevance within the field. Without a precise and well-supported formulation, studies risk vague or unfeasible objectives[1]. A good research question should emerge from a solid theoretical framework and a deep understanding of existing gaps in the literature. Its development does not occur in isolation but through an iterative process that includes critical literature review, dialogue with experts, and feasibility assessment[2]. The impact of a poorly formulated question can be substantial, leading to wasted resources and the generation of irrelevant or inconclusive data. Studies have shown that poorly structured questions can result in ambiguous conclusions, limiting replicability and applicability of findings[3]. Thus, careful formulation of the research question is essential to ensure that study objectives are achieved efficiently and meaningfully.

This editorial aims to examine the main criteria for constructing robust research questions, including frameworks such as PICOT and FINER, while also discussing the role of experience and planning[4]. In addition, it explores the ten fundamental strategies proposed by Mendes *et al.*[2] to enhance research question development, highlighting the importance of literature review and continuous refinement. Common difficulties in formulating research questions and best practices for overcoming them are also addressed.

A well-developed research question guides the selection of methods, sample, and statistical strategies. It also directly affects the applicability of results and their contribution to scientific advancement. Formulating a good question should be a reflective and progressive process, in which the researcher continuously reviews and refines the central issue. As previous-

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ly noted, poorly structured questions can lead to ambiguous conclusions, hindering replicability and the applicability of findings. Therefore, careful formulation is essential to ensure the study's success and scientific relevance[5].

To construct objective and scientifically grounded research questions, widely recognized frameworks such as PICOT and FINER are often used:

- PICOT: Population, Intervention, Comparator, Outcome, and Time. Essential for clinical studies, this model assists in formulating questions for experimental trials.
- FINER: Feasible, Interesting, Novel, Ethical, and Relevant. This model helps assess the feasibility and potential impact of the research within scientific and social contexts.

Beyond these models, the question should be clear, specific, and aligned with the overall research objective. Ongoing refinement — based on literature and expert feedback — is vital to strengthen the investigation. It is equally important to avoid bias during question formulation, ensuring that it remains neutral and open to different possible outcomes[6].

Based on the article by Mendes *et al.*[2] the following strategies are recommended to strengthen the formulation of a research question:

1. Define the problem precisely – The question should emerge from a well-delineated scientific need, avoiding excessive generalizations.
2. Review the literature systematically – Identify knowledge gaps and ground the question in previous studies.
3. Evaluate methodological feasibility – Ensure that the necessary data can be feasibly collected and analyzed.
4. Consider the perspective of stakeholders – Include the views of clinicians, patients, policymakers, or other relevant actors.
5. Balance innovation and applicability – The question should be original while maintaining scientific and practical relevance.
6. Use structured models such as PICOT and FINER – Ensure that the question meets objective and well-defined criteria.
7. Avoid vague or overly broad formulations – Refine the question to ensure specificity and focus.
8. Determine clear and measurable outcomes – Define expected results in objective and verifiable terms.
9. Submit the question to expert review – Seek feedback and suggestions for improvement.
10. Test and adjust the question before study implementation – Refine the question based on preliminary testing and continuous feedback.

The initial formulation of a research question is typically broad and requires successive refinement. A comprehensive literature review plays a central role in narrowing the scope and justifying the question. Additionally, expert consultations and feasibility analysis are essential strategies before data collection begins. This refinement process should be continuous, ensuring that the research question remains relevant and aligned with ongoing scientific and technological developments[3].

Early-career researchers often face difficulties in formulating relevant research questions due to limited familiarity with the subject matter and available methodologies. Over time, accumulated experience and immersion in the literature contribute to the construction of more relevant and scientifically grounded questions. Thus, continuous practice and dialogue with peers are key to developing this skill. Moreover, novice researchers should actively seek mentorships and collaborations with experienced professionals to accelerate their learning and avoid common errors[4].

Researchers frequently encounter difficulties such as identifying gaps in the literature, lack of clarity in objectives, or questions that are too broad or too narrow. To address these challenges, systematic literature reviews, participation in academic discussion groups, and the use of structured frameworks for question formulation are recommended. Consulting experts and testing preliminary questions are also crucial practices to ensure that the research question is both sound and feasible[3].

A poorly structured question can undermine the internal validity of a study and reduce its practical applicability. In contrast, a well-developed research question supports stronger hypotheses, method-

ological rigor, and more robust data analysis. Therefore, dedicating time and effort to formulating a high-quality research question is a critical investment in the success of any scientific inquiry. The quality of the research question impacts not only the study itself but also its contribution to scientific knowledge and influence on professional practice[1,2].

Creating a strong research question is a dynamic process that requires deep knowledge, a systematic literature review, and structured planning. The use of frameworks such as PICOT and FINER, combined with the ten strategies proposed by Mendes *et al*.[2], offers a reliable foundation for developing well-grounded questions. Continuous refinement, consultation with experts, and assessment of feasibility are essential to ensure that the research question meaningfully contributes to science and clinical practice.

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