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Research Methodology and Critical Reading of Studies

The research question in clinical practice: A guideline for its formulation[☆]

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ABSTRACT

The systematic formulation of the research question allows the researcher to focus the study, guide the method decisions, and to put forward possible solutions. In practice, there are difficulties in the formulation of research problems. Diversity of clinical scenarios can lead to a mismatch between the structure of the research question and the classical PICO (population, intervention, control, and outcomes) format. The aim of this article is to provide guidelines that help in the proper formulation of clinical practice research questions for general practitioners, specialists, and healthcare personnel in training.

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La pregunta de investigación en la práctica clínica: guía para formularla

RESUMEN

La elaboración sistemática de la pregunta de investigación permite al investigador enfocar el problema, orientar los métodos y postular posibles soluciones. En la práctica, todavía se observan dificultades en la formulación del problema de investigación. La diversidad de los escenarios clínicos, de donde resulta buena parte de las preguntas de investigación, hace que su formulación no se ajuste siempre a la estrategia PICO. El objetivo de este artículo es aportar una guía que facilite la formulación de las preguntas de investigación que surgen en la práctica clínica a médicos, especialistas y personal en entrenamiento.

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Introduction

The correct formulation of a question is one of the first critical steps in the process of preparing a research study. It helps the researcher to focus on the problem and identify the study variables, the population and the possible outcomes. The research question is the structural axis of the protocol. It guides the development of the theoretical framework, the conceptual hypothesis and the objectives. It also facilitates the selection of the type of epidemiological design that can best answer the particular type of question.^{1,2} At the same time, it facilitates the search for scientific information³ through the specification of search terms,^{4,5} which helps establish the state of the art and, consequently, identify gaps in knowledge of interest to the scientific community.

In routine practice it is very often difficult to identify the elements of the question and achieve suitable wording that matches the intention of the researcher. In order to help researchers in their work, strategies have been developed that simplify the formulating of research questions.⁶⁻⁹ However, there are reports of difficulties in prioritising the questions, insufficient time to formulate and answer them and a lack of tools to carry out an efficient review of the literature.^{10,11} Another obstacle identified is that formulating strategies, such as PICO,¹² are too rigid and do not fit the various research scenarios.

Research objectives are not met because of errors in the expression of the problem and incomplete, imprecise or confusing formulation of the question. As a result, the information obtained from the research process does not always provide the expected responses to the original questions. The objective of this article is to provide general practitioners, specialists and healthcare personnel in training with some key points to facilitate the formulating of research questions, in order to make their writing more efficient and ensure a successful start to the research process.

Definition

The research question is a structured question asked by the researcher about a subject of interest based on a problem that the scientific community has not solved. The problem can be defined as a situation that has invalid, disputed or insufficient results for the generation of conclusions (knowledge gap).¹³ It is important to differentiate the research question from clinical questions, which are designed to cross the knowledge boundaries of the individual posing them, but not of the scientific community. The current strategy for answering that type of question is evidence-based medicine (EBM). However, after an exhaustive search and critical analysis of the literature, that clinical question may be the starting point from which to identify a gap in knowledge, and then be transformed into a research question.

Classification

Research questions are classified into three categories, according to the purpose, objective and clinical context.¹⁴ The

purpose is what the researcher intends with the question they are formulating. For this there are two basic options: to describe a phenomenon of nature at a specific point in time and space (descriptive); or compare interventions, techniques or exposures to determine their association with an outcome (inferential or analytical).

The question's objective is the specific outcome expected by the researcher. If it is about the variability of some clinical or epidemiological aspect, the question is quantitative. If, however, the researcher expects to obtain new categories or processes associated with a phenomenon, the question will be qualitative.

The clinical context is the most used in EBM and defines the universe of clinical activities in which the question is immersed. Clinical practice includes four basic activities: the identification of risk factors (aetiology, causality); the detection of diseases based on questioning, physical examination and paraclinical data (diagnosis); prevention or treatment (intervention); and prediction of the consequences of the condition over time (prognosis).

Structure

Descriptive

The structure of the descriptive questions includes the following elements: an interrogative adjective (which, how much, who); the measurement (prevalence, incidence); a condition (depression, anxiety); the population; the place; and the time.¹⁴ This defines a very specific population to which the results would be generalised. Questions about frequencies such as prevalence and incidence belong in this structure.

Inferential

The strategy most used in clinical practice to structure inferential questions is PICO.¹² This format includes population (P); intervention, exposure or diagnostic technique (I, E or T, respectively) comparison (C) and an outcome (O). Within the framework of EBM, the "T" is sometimes used to establish the type of study that would best answer the clinical question,⁴ but for research questions it would be equivalent to the follow-up time of the condition or the time in which it is expected to take effect (PICOT).^{12,15}

One category not included in this strategy, but which would avoid confusion in the wording of the question, is measurement (M). The researcher has to determine whether they want to measure the effect of an intervention, the risk of suffering an outcome due to the presence of a particular factor or the operating characteristics of a diagnostic test.

Guidelines are provided below on quantitative questions in the clinical context, which include a proposed structure.

Aetiology or causality

These questions have negative connotations. They arise when the researcher thinks of a factor that will increase the likelihood of suffering from a disease or condition. Some examples of risk factors are: use of psychoactive substances, tobacco or alcohol; sedentary lifestyle; and noise.

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