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Assessment of Perceived Health Care Service Quality

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ABSTRACT

This article's objective is to describe a simplified method for developing and assessing the quality of healthcare-related research questions. This process involved three stages. The objective of the initial phase was to identify and investigate a scientific field. This field would be used to identify outputs such as analysis units, variables, and goals. The objective of the second stage was to formulate structured research questions based on the findings of the first phase. In general, research questions begin with interrogative adverbs (e.g., what and when), auxiliary verbs (e.g., is there and are there), or other auxiliaries (e.g., do, does, and did); followed by nouns nominalized from verbs of research objectives, such as association, correlation, influence, causation, prediction, and application; research variables (e.g., risk factors, efficiency, effectiveness, and safety); and units of measurement (e.g., patients with hypertension and general hospitals). The objective of the third stage was to evaluate the relevance, originality, generalizability, measurability, communicability, resource availability, and ethical considerations of the research questions. By adhering to the proposed streamlined procedure, inexperienced researchers can learn how to compose well-structured research questions with solid scientific value.

KEYWORDS: writing research questions, quality of research questions, healthcare

ARTICLE DETAILS

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INTRODUCTION

Important to the success of research projects is the selection of high-quality research questions. [1,2] Research questions are designed to address knowledge gaps and generate hypotheses (e.g., unknown and controversial knowledge). In research projects, the scientific method is used to answer such questions.

Inexperienced and untrained in the steps and procedures of the scientific method, novice researchers may be unable to efficiently develop high-quality research questions. [1,3]. Even if novice researchers attempt to self-educate on the processes of identifying research questions, the vast body of literature published on the subject may hinder their ability to learn effectively. Developing research questions is a time-consuming and challenging process.

This article aims to provide a simplified method for developing and assessing the quality of health-related research questions. For novice researchers who will independently design and conduct research projects and publish their findings in peer-reviewed journals, the process is broken down into three stages. Figure 1 illustrates a process overview.

STAGE 1. SELECTING AND EXPLORING A SCIENCE FIELD

Step 1: Selecting a science field

Step 1 requires the selection of a specific scientific field for study. Simply put, a science field is a subject area that scientific communities study for research purposes. Classifications of scientific fields may be useful for identifying such fields. The Qatar National Research Foundation, for instance [4]. Subsets of science include the natural sciences, engineering and technology, medical and health sciences, agricultural sciences, social sciences, and humanities. Such expansive fields are divided into fields of intermediate size. For instance, the field of medical and health sciences is subdivided into health sciences, basic medicine, clinical medicine, medical biotechnology, and other medical sciences. Finally, larger fields are subdivided into smaller fields. They divide the field of health sciences into subfields

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such as hospital administration, health policy, nursing, nutrition, dietetics, public health, environmental health, tropical medicine, epidemiology, occupational health, social biomedical health, etc

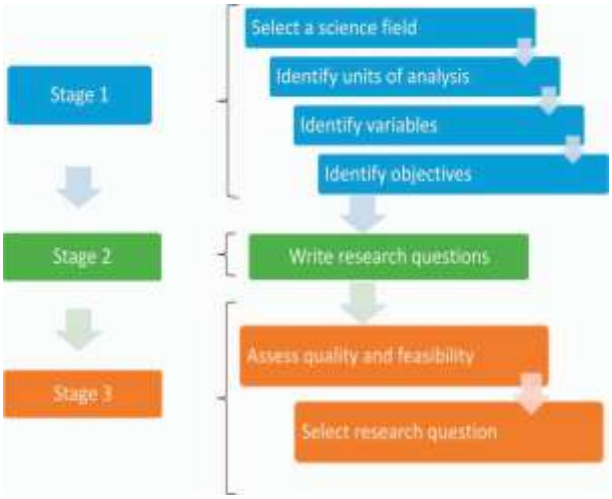

Figure 1. Overview of process to build and assess the quality of healthcare-related research questions.

Whether you choose a science field suggested by someone else or one from your own knowledge, look for evidence (such as peer-reviewed journal articles) that supports its scientific legitimacy. Scientists and editors from research institutes and scientific journals publish definitions and descriptions of their fields of interest on web pages and in journal articles [5] as well as on research agendas. [2]

If such evidence is difficult to find, try a keyword search on the Internet, such as the one provided below. Initially, determine which keywords or phrases you believe to be scientific field names. Whenever necessary, combine your keywords with one or more of the following terms: science, research, research agenda, research center, World Health Organization research, international forum, and journal. The second step is to enclose keywords or phrases in quotation marks and enter them into a search engine. Finally, examine a few (e.g., ten) of the top hits on the search engine results pages, especially those that match the query phrase, for evidence of the science field's legitimacy. For instance, I combined the terms healthcare quality and journal to create healthcare quality journal. Then I searched Google using quotation marks. The query returned 13,800 results. I discovered a peer-reviewed journal on healthcare quality within the first 10 pages. With this evidence, I felt confident in the scientific field of healthcare quality known as quality assurance. If you are interested in multiple scientific fields, prioritize one that has social relevance, feasibility (e.g., technical, material, and financial), and a low risk of ethical issues for research purposes.

Step 2: Identifying units of analysis (UAs)

Step 2 entails two tasks: first, identifying potential UAs of interest for scientific inquiry from the standpoint of the science field chosen in step 1, and second, selecting one or a few of them. The UA is a definable and measurable natural or social entity.

Table 1. Example units of analysis for the field of healthcare quality

Category	Examples
Individuals	Patient with type I diabetes, patients with substance abuse disorder, and individual nurses
	Nurses, doctors, quality specialists, families, and surgical teams
Organizations	Hospital networks, health centers, nursing homes, and medical schools
Social interactions	Communication, relationships, and conflicts Social artifacts
	Strategic health plans, quality policies, hospital buildings, health technologies, vaccines, drugs, and medical charts

Content based on Babbie.[7]

which projects seek answers to research questions? There are two primary reasons why a list of UAs is compiled. The first objective is to make a novice researcher aware of the different kinds of UAs that exist within a science field. In the field of medicine, for instance, this knowledge would enable researchers to consider not only patients but also other types

of UAs for their research projects. The second objective is to increase awareness of the potential for developing research questions for studies that target multiple UAs, such as multilevel analysis studies. Following are four recommendations for creating a list of UAs.

Utilize publicly accessible lists or classification systems of UAs to identify UAs.

For instance, one published list of UAs includes control projects, single patients, single clinicians, clinics, and patient populations in nursing homes, hospital wards, microsystems, or entire hospitals. [6] Babbie [7] The five categories of UAs are individuals, groups, organizations, social interactions, and social artifacts. Lofland [8] In social science fields, UA categories include cultural practices, episodes, encounters, roles, social and personal relationships, groups and cliques, organizations, settlements and habitats, and subcultures and lifestyles. The UAs in the field of healthcare quality are listed in Table 1. The second tip for distinguishing UAs is to use specific phrases. Individual humans, for example, includes all humans, whereas human with type I diabetes over the age of 40 is specific enough to include only those individuals.

A specific condition or disease, such as hypertension, diabetes, or dengue; behaviors such as physical activity, diet, and sexual practices; functions and capacities such as attention, memory, and judgment; and socio-demographic characteristics such as age, ethnicity, religion, and marital status are examples of additional criteria for human group differentiation.

The third piece of advice is to compile a list of homogeneous UAs, particularly when analyzing consolidated data, such as in quantitative studies. Examine the standard "production" process of each unit in order to comprehend the UA homogenous population. On the one hand, UAs favor products (e.g., vaccines)

Table 2. Example units of analysis and variables for the field of healthcare quality

	Variables					
Units of aanalysis	Characteristics	Frequencies	Factors or causes	Processes	Effects	Solutions
Patient with diabetes type I	Age and gender	Percentage of patients dissatisfied	Look-alike drugs	Self-care Aging	Adverse events	Drugs and diets adherences
Professional groups of nurses, doctors	Group size and average years of professional experience	Incidence of conflicts between nurses and doctors	Professional subculture	Time spent on verbal communication	Adverse events	Multiprofessional teamwork practice in health-related careers
Hospital	Score of PSC	The proportion of hospitals measuring PSC annually	Determinants of PSC	Quality improvement systems	Adverse events	Cognitive debiasing training strategy

PSC: patient safety culture.

Using standardized industrial processes, mass-produced goods are relatively identical. Nevertheless, UAs such as social constructs (e.g., neighborhoods) are typically not homogeneous because they emerge spontaneously through social processes, with typically few limitations and flexible constraints. Even within the same city, neighborhoods can vary in size, social composition, economic status, and so on.

Use UAs to formulate research questions for qualitative and quantitative studies involving single, small, and large natural or social entities.

For instance, the World Health Organization is a single entity; the number of continents in the world is small, whereas the number of cities is large. In quantitative studies, the inferential power of statistical analysis of a small sample of UAs may be compromised.

The second component of step 2 is to select one or more UAs to develop in step 3, which is to generate a list of variables for each UA. Prioritize UAs for research purposes that are socially relevant, technically and financially feasible, and carry a low risk of ethical issues.

Step 3: Identifying variables and phenomena for research

The objective of step three is to compile a list of variables and phenomena associated with each UA selected in step two. Variables are measurable attributes of UAs whose values vary based on the context.

Phenomena define the significance, interpretation, or clarification of UA variables. [9,10]

At this point, researchers should be familiar with the vast array of variables and phenomena associated with each UA. A research project may employ one, two, or multiple variables, depending on the research questions it seeks to answer. It is easier to formulate univariate, bivariate, and multivariate research questions with a larger list of variables. The example UAs and variables in the field of healthcare quality are presented in Table 2. Here are three recommendations for creating a list of variables and occurrences.

The first piece of advice is to conduct a thorough literature search for relevant scientific publications, variable by variable. Keep in mind that quantitative publications frequently use the term variable, whereas qualitative

publications may use different terms (e.g., phenomena). [9,10] This distinction may be because qualitative research seeks to understand the how and why of specific behaviors, decisions, and individual experiences. [9] and such comprehension is not quantifiable.

The second piece of advice is to identify a useful framework for classifying diverse variables. As an illustration, Lofland's[8] A question typology can help classify variables and phenomena according to type, frequency, magnitude, structure, process, cause, effect, and agent. Another classification promoted by the quality management systems field,[11] is that of quality management systems (QMS). Physical (e.g., physical activity, drug safety, surgical procedure effectiveness); sensory (e.g., vision, smell, hearing); behavioral (e.g., courtesy, honesty, veracity); temporal (e.g., punctuality, reliability, availability); ergonomic (e.g., physiology or human safety); and functional. Consider every variable, whether simple or complex, as a single unit. Simple variables can be measured by a single indicator (i.e., age, sex).

Typically, complex variables are subdivided into multiple dimensions (for instance, patient safety culture may be subdivided into teamwork and communication), and each dimension can be measured using multiple indicators. When a researcher includes complex variables and their dimensions as separate units in the same list, the total number of variables increases, potentially making analysis more complicated.

Step 4: Identifying possible research objectives

Creating a list of potential research project objectives of interest is the objective of Step 4. The anticipated outcome of a research project is its objective. The research objectives determine whether a project seeks to describe one or more variables and phenomena or to examine how two or more variables interact.

UA	Variables	Objectives	Examples of research questions
Hospital	Dimensions of PSC	*Exploratory*: To identify dimensions of PSC in Hospital	What are the dimensions of PSC in hospitals?
Hospital	PSC	*Descriptive*: To assess the hospital PSC	What are the strengths and weaknesses of PSC in hospitals?
Hospital	PSC and adverse events	*Correlational*: To correlate the score of PSC and incidence of adverse events in hospitals	What is the relationship between PSC and adverse events in hospitals?
Hospital	System-level factors and adverse drug events	*Explicative*: To analyze the system-level factors contributing to adverse drug events in hospitals	What are the system-level factors contributing to noncompliance with timely administration of drugs in hospitals?
Hospital	Team trust and willingness to discuss patient safety issues	*Predictive*: To determine if team trust is a predictor of the willingness to speak on patient safety issues in hospitals	Does team trust predict the willingness to speak on patient safety issues in hospitals?
Hospital	Electronic prescription and medication error rate	*Applicative*: To assess the effectiveness of using electronic prescriptions to reduce the medication error rate in hospitals	How can the medication error rate be reduced by using electronic prescriptions in hospitals?

UA: units of analysis; PSC: patient safety culture.

Objectives and research questions are interdependent. Creating a list of objectives will therefore facilitate the development of a list of research questions. Common classifications include exploratory, descriptive, correlational, explanatory, predictive, and applied objectives. The purpose of exploratory objectives is to discover, comprehend, and characterize phenomena and their interrelationships. The objective of descriptive objectives is to count the frequency of variables without making comparisons. Correlational objectives assess the interrelationships between two or more variables. Explanatory objectives investigate the relationship between variables' causes and effects. Predictive objectives seek to predict the behavior of one variable by gaining insight into the behavior of other variables. The objectives of the application are to examine the efficacy of interventions in altering the status and behaviors of other variables. Table 3 is an example of an UA that includes variables, objectives, and research questions regarding healthcare quality.

Table 4. Examples of framework used to write research questions

Acronym	Elements of the framework
PICO	Population, Intervention, Comparison, Outcome
PICOS	Patient population or problem, Intervention (treatment or test), Comparison (group or treatment), Outcomes, and Setting or study type
PICOT	Patient population of interest, Intervention or issue of interest, Comparison with another intervention or issue, Outcome of interest and Time frame
PESICO	Person, Environment, Stakeholders, Intervention, Comparison, Outcomes,
SPICE	Setting, Perspective, Intervention or Exposure or Interest, Comparison, Evaluation
SPIDER	Sample, Phenomenon of Interest, Design, Evaluation, Research Type

Content based on Fandino,[1] Thabane et al,[3] Cooke et al,[9] and Can˜o´n and Buitrago-Go´mez.[10]

STAGE 2: WRITING STRUCTURED RESEARCH QUESTIONS

The objective of the second stage is to generate a list of possible research questions for the project. A research question is "a logical statement that moves from what is known or believed to be true to what is unknown and must be validated." [12] A research question specifies the specific knowledge that a research project hopes to discover by investigating one or more variables or phenomena associated with one or more UAs.

Interrogative adverbs (e.g., what, why, who, when, and where), auxiliary verbs (e.g., is there and are there), or other auxiliaries (e.g., do, does, and did); nouns nominalized from verbs of research objectives, such as association, correlation, causation, prediction, and application; research variables (e.g., incidence, prevalence, risk factors, causes, and effects); and UAs (e.g., patients with hypertension, mothers, pregnant women with diabetes, and general hospitals). The format of prognosis-related research questions and relationships between interventions and outcomes would resemble that of Table 4. [1,3,9,10]

Write structured research questions using the outputs of the first stage (e.g., UA list, variables, and objectives) and general or specific formats for structuring research questions. There are examples of research questions in Table 3.

STAGE 3: ASSESSING AND SELECTING RESEARCH QUESTIONS

Step 1: Assessing the quality and feasibility of a research question

This step entails assessing the quality of the research question based on a set of criteria, such as those shown in Figure 2. These criteria have been discussed elsewhere in greater detail. [2,3,13,14] Other criteria for evaluating the quality of research questions include answerability, efficiency, innovation, implementation, burden reduction, and fairness. [2] Researchers may also use criteria derived from acronyms such as FINER (feasible, interesting, novel, ethical, and relevant)[1,3] and I-SMART (important, specific, measurable, achievable, relevant, and timely). [14] On a scale from 1 to 10, rate the criteria's quality and applicability (i.e., 10 being highest quality and 1 being lowest). Remember to score each criterion using the same scale. Finally, add up the points earned for each research question.

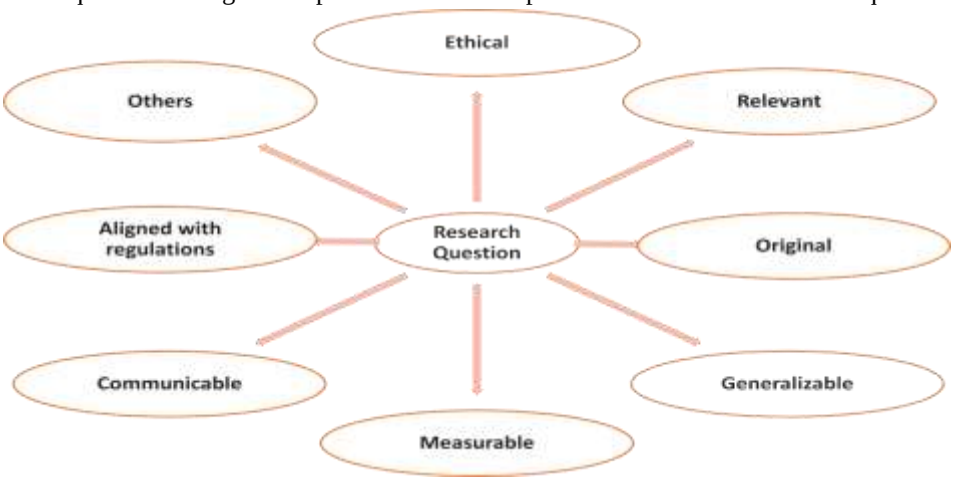

Figure 2. Examples of criteria used to assess the quality of research questions.

Step 2: Selecting the research question

Select the research questions with the highest quality ratings from the preceding step. Avoid selecting high-risk ethical questions regardless of the performance of the other criteria. Lastly, if answering a research question with the available resources is not feasible (e.g., too costly or complex), the

question may be shelved until the conditions for feasibility improve.

SUMMARY

Developing a high-quality research question through guesswork is improbable, particularly for inexperienced researchers with no training in the scientific method. The proposed streamlined method is intended to aid inexperienced researchers in developing structured, high-quality research questions. The key concepts and framework of the scientific method presented illustrate the plethora of research questions that can be developed by scientists in any scientific field. The importance of evaluating the quality of research questions using a well-established set of criteria was emphasized. This streamlined procedure instructs novice researchers on how to construct scientifically sound research questions in a systematic manner.

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