

# Beyond PICO—A New Question Simplifies the Search for Evidence

A revised framework can inform practice improvement.

## ABSTRACT

The framework for the PICO (population, intervention, comparison intervention, outcome) question was developed for use in the field of medicine to help determine the best treatment or intervention for a patient. However, use of the PICO question often fails to make sense when the problem or issue of interest is unrelated to determining the best treatment; in such cases, PICO is a less-than-optimal framework to use in searching for evidence. Nurses undertaking an evidence-based practice quality improvement (EBPQI) initiative must begin with a full understanding of the problem by exploring both external evidence (research) and internal evidence from the local setting to support the initiative. This article presents the framework for an alternative question—PPCO, or problem, population, change, outcome—that simplifies the search for evidence and provides a universal approach to question development for EBPQI initiatives. The PPCO question was developed for use with all nursing issues that need addressing.

**Keywords:** evidence-based practice, literature search, quality improvement, research

Have you experienced frustration or confusion when trying to develop a question to inform a systematic search for the evidence to address a health care–related problem? Rest assured you are not alone. We have been teaching nursing for decades, and the two topics we love to teach most are evidence-based practice and quality improvement. Although we have been faithful in the past to use of the traditional PICO (population, intervention, comparison intervention, outcome) question in searching for evidence to guide practice improvement, we’ve found that this framework isn’t always optimal. We decided to search for evidence supporting the PICO framework and, to our surprise, discovered that it is quite limited, especially in the field of nursing.<sup>1</sup>

## BACKGROUND

The PICO question framework was developed for use in research in the field of medicine<sup>2</sup> to help determine the best treatment or intervention for a sick patient, and it can work quite well for this purpose. In the

classic PICO question, the population (P) can include many characteristics, such as age, gender, disease, symptoms, or current treatment. The intervention (I) and comparison intervention (C) components can incorporate all therapies (such as drugs, procedures, tests, surgeries, usual care, or placebo). The outcome (O) is what occurs (ideally an improvement in disease indicators or consequences) as the result of the intervention or comparison intervention. To narrow the results of the PICO question, other elements can be added, such as a specific time frame (PICOT) or setting (PICOS).

We all want to find the best available research evidence to support proposed practice changes, yet the traditional PICO question favors experimental research evidence and that from medical interventions. Research evidence is usually defined hierarchically—as a pyramid whose top tier reflects the highest level of evidence, such as systematic reviews of randomized controlled trials. This approach can be problematic, however, because most research studies have historically excluded minority popula-



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tions; therefore, using the PICO question may reveal significant gaps in evidence if the population is underrepresented.<sup>3</sup>

Another issue with the PICO question is that it supports a premature bias toward an already-known intervention or practice change.<sup>4</sup> It begs the nurse to identify an intervention and compare it to another intervention or to the more common usual care. This results in a search biased toward the chosen intervention or solution and risks overlooking an alternative that might be more effective.<sup>4</sup> For example, a nurse who seeks to address the problem of health care-acquired infections wants to learn about best practices to reduce these infections. Picking one intervention and comparing it to usual practice or to another intervention will bias the search, and the narrow “intervention versus comparison” search framework might cause the nurse to miss a vital practice change.

Furthermore, nurses have varied interests: some may want to learn about the best treatment for a patient with a specific condition, whereas others may want to focus on administration issues, leadership problems, or health care-related technology questions. Use of the PICO question often fails to make sense when the problem or issue of interest is unrelated to determining the best treatment for a patient, thus leaving nurses with a less-than-optimal framework to use for searching for evidence. While many different frameworks have been proposed that are specific to certain problems, such as SPIDER (sample, phenomenon of interest, design, evaluation, research type) for searching qualitative and

mixed-methods studies, SPICE (setting, population, intervention, comparison, evaluation) for qualitative questions, and ECLIPSE (expectation, client group, location, impact, professionals, service) for topics concerning health management, having to find and use a different framework for each type of issue is cumbersome.<sup>1,3</sup>

In addition to being a poor match for many nursing issues, the PICO question doesn’t always address the need to describe a problem thoroughly and understand its consequences before attempting to determine possible solutions. Furthermore, the problem of interest must be described both generally and specifically (in relation to the local context). To broadly describe a problem, one uses a background question, as opposed to the more specific PICO, or foreground, question.<sup>5</sup> It is crucial that the general background question be asked before the PICO question is written. The traditional PICO question does not include a reminder to do this, which can create confusion. Moreover, the search for knowledge about the extent of a problem entails exploring external evidence (research) to support the evidence-based practice quality improvement (EBPQI) initiative as well as internal evidence from the local setting or specific area. A framework that systematically includes this vital step in building the evidence foundation—which the PICO framework does not—is needed.

To highlight the importance of exploring both external and internal evidence, we refer to the experience of a former student who was interested in addressing the problem of childhood obesity. There

**Table 1.** The PPCO Framework and an Example

Element	Description	Example
Problem (P)	What is the problem in general (external evidence) and specifically in the local context (internal evidence)?	Dehydration related to ileostomy placement
Population (P)	Who does the problem impact?	Adult patients with cancer
Change (C)	What has been recommended or done to address the problem?	Changes in practice or processes
Outcome (O)	How are outcomes reported (measured)?	Readmission

is a plethora of research on this problem, and even some research on effective interventions; however, when this student began working as an NP in a pediatric practice focused on holistic health and wellness, she found that the patient population included very few children who were overweight or obese. Therefore, an EBPQI initiative to reduce childhood obesity was not indicated in her setting. Any improvement efforts would have been a waste of valuable health care resources.

We believe that the traditional PICO format for building a research question is less accurate when the question concerns an issue or system process rather than a population or disease process, yet many of the problems that nurses encounter are unrelated to treatments or interventions. For example, problems may be related to management processes, systems of care, program effectiveness, policies and protocols, or public disaster responses. Nurses identify health-related issues in a wide variety of settings and should try to address the many factors that affect people's health beyond the clinic or hospital setting, such as social determinants of health.<sup>6,7</sup>

Since the inception of the PICO question, attempts have been made to adapt it to different types of problems,<sup>3,8</sup> but to us, using it for nursing issues, in particular, feels like trying to fit a square peg into a round hole. We believe in identifying evidence as the foundation of every EBPQI initiative. In that spirit, we present a new framework—PPCO, or problem, population, change, outcome—to simplify the search for evidence and provide a universal approach to question development for EBPQI initiatives—and for all nursing issues that need addressing.

### THE PPCO QUESTION

The PPCO format reflects a combination of the background and foreground questions, with the first P representing the problem the nurse or team wishes to address. Placing the problem P first is a reminder of the need to first ask the background question and become well informed about the problem both in general and specifically in the local context before looking for evidence-based solutions. The second P stands for population; the nurse must specify the population impacted by the problem. C stands for change—what

has been demonstrated (by research) to address the problem. The question ends with O for outcome, or the observable difference the change has made.

Consider the following example: A nurse administrator notices that adult patients with cancer who have newly placed ileostomies frequently present to the ED with dehydration, leading to readmission. He thinks this must surely be a preventable problem and decides to collect evidence on how to address it using the PPCO framework. He first needs to determine whether this issue (dehydration due to ileostomy placement) is a general problem (first P) for this population (adult patients with cancer; second P). He searches the literature using a simple question such as, “What is the incidence or prevalence of dehydration in adult patients with cancer and an ileostomy?” and finds that dehydration is indeed a serious issue and the most common reason for readmission among such patients. Dehydration can also lead to numerous consequences for these patients and be a resource burden on the health system.

The nurse administrator must next find local or internal evidence (beyond his observations), if possible. He seeks assistance from admissions personnel, who identify the most common admission diagnoses for patients with cancer and an ileostomy and calculate the readmission rate among this population for the prior six months. The results show that his observation was accurate: readmission for dehydration among such patients is an ongoing problem for the organization—but is there a solution?

The nurse administrator is now ready to search for evidence about known ways to address the problem. To be sure that his evidence search is not biased and that he finds the highest quality, most relevant studies (even if the outcomes are not positive), he formulates this question: “When dehydration related to ileostomy placement prompts presentation to the ED (P) in adult patients with cancer (P), what measures can be taken (C) to impact readmission (O)?” (See Table 1.) Ideally, this question will help him identify all the effective changes that can be made in his setting to decrease dehydration in this population and hopefully prevent readmission, which is his aim.

His search of the literature reveals that short-term follow-up evaluation for signs and symptoms of dehy-

dration after an ileostomy and subsequent patient education on self-management is the best intervention to prevent readmission due to dehydration. He proposes that patients be seen in the clinic by an NP four to seven days after ileostomy placement for this follow-up evaluation and education.

Finally, the nurse administrator presents to upper administrators the evidence on the problem in general, including how costly it is for both patients and the health care system, as well as the data on how many ileostomy patients have been readmitted for dehydration over the past six months. Not surprisingly, they are eager to hear his evidence-based ideas for practice change and improvement.

## CONCLUSION

EBPQI initiatives begin with an understanding of the clinical problem or issue coupled with knowledge of the local context. A new, more specific EBPQI model is needed to align practice changes with the formation of searchable questions to guide the development of EBPQI initiatives in real-world settings. The PPCO question can serve as a practical and accessible starting point for the search for EBPQI evidence, as it reflects the current health care landscape. Developing a focused question is a learned skill and should not necessarily require the assistance of a librarian, as most nurses will not have the luxury of this resource. The question should provide a clear pathway to realistic, standardized searches of the most inclusive, relevant, high-quality evidence available to inform best practices within health care systems and global communities.

As nurses, we strive in many spaces—community, clinical, and academic—to effect positive changes in health-related systems and the lives of our patients. How we pursue change also needs to change. Depending on the focus of the next health-related problem you encounter, consider crafting both a PICO and a

PPCO question to explore the difference between these approaches. We believe that you may obtain better results and find the process much less frustrating with PPCO. ▼

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