7 Steps to the Perfect PICO Search
Evidence-Based Nursing Practice

Overview

Searching for high-quality clinical research evidence can be a daunting task, yet it is an integral part of the evidence-based practice process. One way to streamline and improve the research process for nurses and researchers of all backgrounds is to utilize the PICO search strategy. PICO is a format for developing a good clinical research question prior to starting one's research. It is a mnemonic used to describe the four elements of a sound clinical foreground question (Yale University's Cushing/Whitney Medical Library).

In this white paper, we will explore the importance of evidence-based nursing practice, take a deeper dive into the PICO process, and provide an example of the PICO process in action through a case scenario. Whether you are a librarian, a nurse or a nursing student, the chances are good that you will learn something new as you read, *7 Steps to the Perfect PICO Search*.)

What is Evidence-Based Nursing Practice and Why is it Important?

"Evidence-based practice in nursing is using and carrying out nursing practices based on the best available knowledge. Evidence-based practice integrates the nurse's clinical expertise with the best external research evidence, and takes into account patient preferences to deliver quality nursing care."

– Victoria Schirm, Director of Nursing Research, Penn State University

Evidence-based nursing is a process founded on the collection, interpretation, appraisal, and integration of valid, clinically significant, and applicable research. It is not about developing new knowledge or validating existing knowledge, but rather translating existing evidence so that it can be applied to clinical decision making. The expected standard in modern healthcare systems, ***evidence-based nursing practice*** links research and theory to practice, providing clinicians with current, reliable research-driven data to guide patient care decisions.

Research has shown that patient outcomes are substantially improved when health care is based on evidence from well-designed studies versus tradition or clinical expertise alone. Better patient outcomes lead to more efficient performance, which is crucial for hospitals with staffing challenges.

What is the PICO Process?

PICO is a format for developing a good clinical research question prior to starting one's research. It is a mnemonic used to describe the four elements of a sound clinical foreground question. (Yale University's Cushing/Whitney Medical Library). The question needs to identify the patient or population we intend to study, the intervention or treatment we plan to use, the comparison of one intervention to another (if applicable) and the outcome we anticipate. These make up the four elements of the PICO model: **P**atient/Problem, **I**ntervention, **C**omparison and **O**utcome.

The PICO process starts with a case scenario from which a question is constructed that is relevant to the case and is phrased in such a way as to facilitate finding an answer. Once a well-structured question is formulated, researchers will be in a better position to search the literature for evidence that will support their original PICO question. (In the last few years, researchers have added **(T)** to the PICO formula, capturing the timeframe of the study. For the purposes of this paper, we did not include time.)

7 Steps to the Perfect PICO Search

1. Formulate the PICO Question
2. Identify Keywords for each PICO Element
3. Plan the Search Strategy
4. Execute the Search
5. Refine the Results
6. Review the Literature
7. Assess the Evidence

Step 1: Formulate the PICO Question

Case Scenario:
You are a Registered Nurse working on a Urology unit. One of your patients is a 55-year-old man who is recovering from abdominal surgery — specifically a laparoscopic prostatectomy. The patient complains of abdominal pain and nausea. His abdomen is distended, and he has no bowel sounds. The physician suspects a paralytic ileus and confirms the diagnosis based on the combination of clinical features and imaging.

At the next Evidence-Based Nursing Practice Committee meeting, you discuss this case. The committee decides to do a case study to determine if there is evidence to suggest that a simple intervention such as chewing gum post-operatively can prevent a post-operative ileus following abdominal surgery

Based on this scenario, our research question is: "In patients undergoing ***abdominal surgery***, is there evidence to suggest that ***chewing gum*** post-operatively compared with not chewing gum post-operatively affects ***post-operative ileus***?"

Step 2: Identify Keywords for each PICO Element

Population (P) – What individual or group are we interested in studying?

Intervention (I) – What is the action (intervention, treatment) we are considering taking?

Comparison (C) – To what other action (intervention, treatment) are we comparing the considered action?

Outcome (O) – What do we anticipate as an outcome?

"In patients undergoing ***abdominal surgery***, is there evidence to suggest that ***chewing gum*** post-operatively compared with not chewing gum post-operatively affects ***post-operative ileus***?"

PICO Elements	Keywords
P (**P**atient or **P**opulation)	**Patients** undergoing **abdominal surgery**
I (**I**ntervention)	**Chewing gum**
C (**C**omparison)	Not chewing gum
O (**O**utcome)	Affects **post-operative ileus**

Fig. 1

Step 3: Plan Your Search Strategy

Plan a search strategy by:

- Determining which database(s) to search
- Identifying the major elements of your question
- Translating natural language terms to subject descriptors, CINAHL Headings, or synonyms

Interface: EBSCOhost Research Databases

Database: CINAHL Ultimate

Search Screen: Advanced Search

Synonyms, words or phrases that mean exactly or nearly the same as another word or phrase, can help expand your search appropriately. For example: when searching the keyword ***'surgery'***, you might miss articles that instead describe a patient as ***'postoperative'*** or in ***'recovery'***. Adding synonyms will help to expand your results to those articles that are still relevant but might not include the words ***'abdominal surgery'***. These are shown as 'Search Strategies' in the table below.

CINAHL Ultimate

CINAHL Ultimate is just one of the information resources a nursing researcher can utilize to execute a perfect PICO search. Considered to be the definitive research tool for nursing and allied health professionals, CINAHL Ultimate provides fast and easy access to top nursing and allied health journals, evidence-based care sheets, quick lessons, and continuing education modules. This database contains full text for many of the most-used journals found in the CINAHL index. With CINAHL Ultimate, users can access a comprehensive scope of content covering all nursing specialties as well as allied health subjects including speech and language pathology, nutrition, physical therapy and much more.

PICO Elements	Keywords	Search Terms	Search Strategies
P (**P**atient or **P**opulation)	Patients undergoing abdominal surgery	Abdominal Surgery	Abdominal surgery **OR** Surgery **OR** Postoperative **OR** Recovery
I (**I**ntervention)	Chewing gum	Chewing Gum	Chewing Gum **OR** Gum
C (**C**omparison)	Not chewing gum		
O (**O**utcome)	Affects post-operative ileus	Postoperative Ileus	Postoperative Ileus **OR** Paralytic Ileus **OR** Ileus

Fig. 2

Step 4: Execute the Search

Before you begin your search, you will want to ensure the ***Search Mode*** is set to ***Boolean/Phrase***. The reason this is important is because this option allows for "exact phrase" searching. For example, if you searched for the phrase, Heart Disease, the system would search for records where the two words heart and disease appear together, as a phrase, and not simply records where the two words appear separately.

To begin your search, first refer to Fig. 2 above. Each PICO Element (P, I, C, O) will be searched individually using the correlating Search Strategy. After each search, you will clear the screen and start a new search before beginning your next search. Once the searches are completed, we will combine all of the searches.

- **P (Patient or Population):** Begin your search with the Patient or Population, which are those patients undergoing ***abdominal surgery***. As mentioned above, to increase your search results, try adding less descriptive terms that have the same meaning, such as ***Surgery, Postoperative*** or ***Recovery***. **Note: Be sure to use the Boolean operator, "Or", so that each result contains **at least one** of these search terms. Fig. 3 is an example of this search strategy shown on EBSCOhost.* Click "Search".

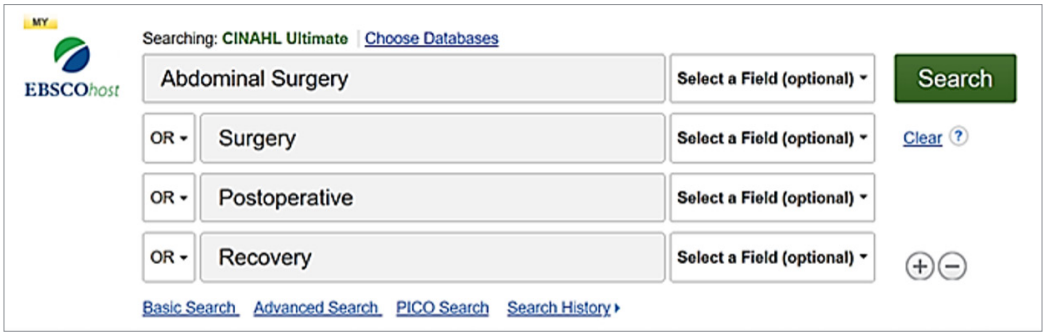

Fig. 3

- **I (Intervention):** Start a new search for the Intervention, which is ***Chewing Gum*** or ***Gum***. Be sure to use the Boolean operator, "Or". Then click "Search".

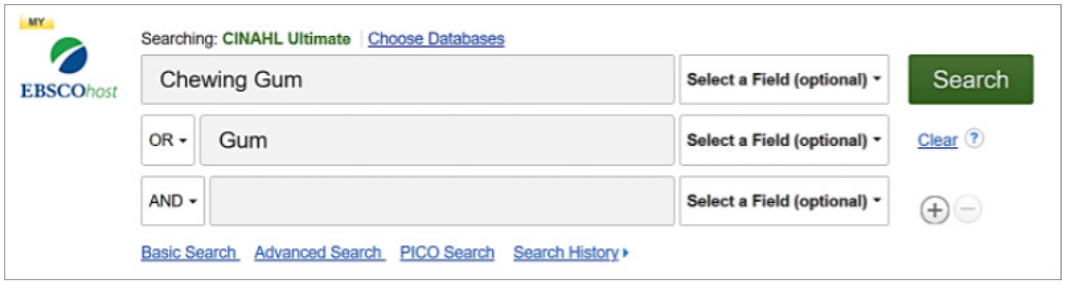

Fig. 4

- **C (Comparison):** The Comparison in this search would be "not chewing gum", so we will not be adding the Comparison component.
- **O (Outcome):** You can now conduct a search for the Outcome, which is ***post-operative ileus***. Add the synonyms ***paralytic ileus*** or ***ileus***. Your goal is to determine whether chewing gum postoperatively affects postoperative ileus, positively or negatively. Click search and note the number of results.

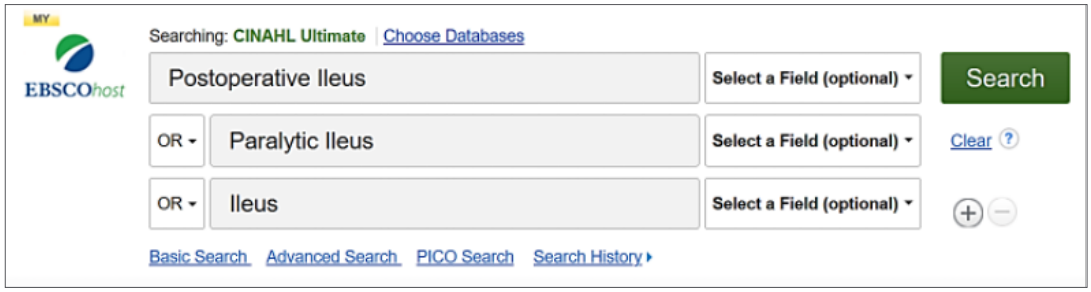

Fig. 5

- **Combine searches:** To complete your search, you will combine the Population (those patients undergoing abdominal surgery); the Intervention (Chewing gum) and the Outcome (Post-operative ileus/paralytic ileus). By using your database's Search History, you should be able to combine these searches into one search showing results from all three of your previous searches.

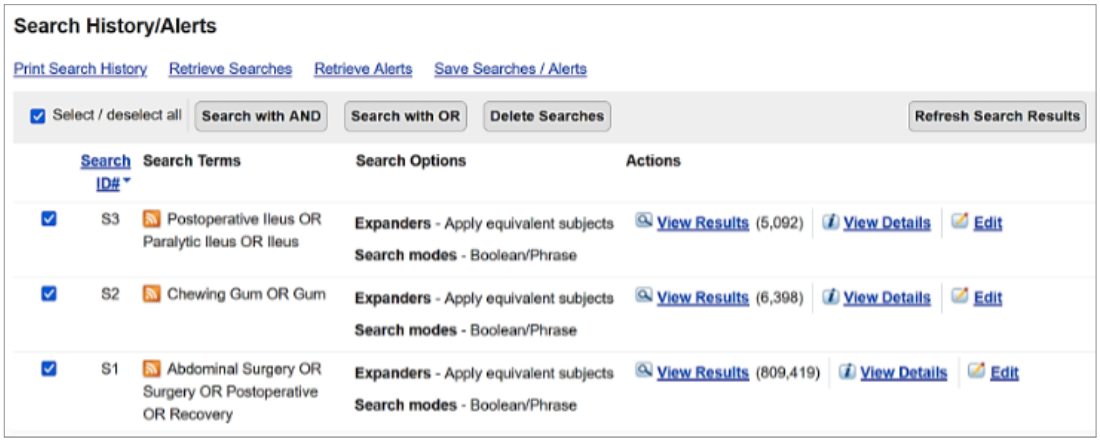

Fig. 6

S4 represents the results of our combined search. Now click “View Results” to see all 79 articles that meet your criteria. Fig. 7

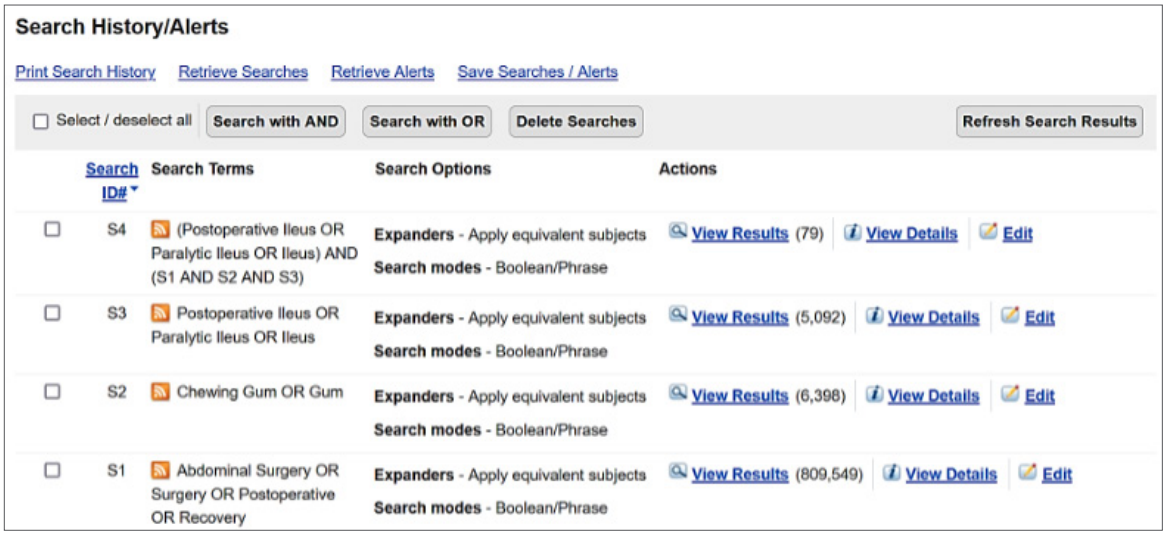

Fig. 7

Step 5: Refine Your Results

Applying limiters to your search ensures you will view the most relevant articles. Make sure your results are set to the most relevant, not the newest. On the left side of the CINAHL results page, under “Refine Results”, limit to “Full Text”. Then, use the date slider to choose articles that are less than 5 years old. Use “Show More” for additional limiters, if warranted.

Step 6: Review the Literature

Once you have added limiters to your combined search and run the results again, choose and review articles that are most relevant to your PICO question. Fig. 8

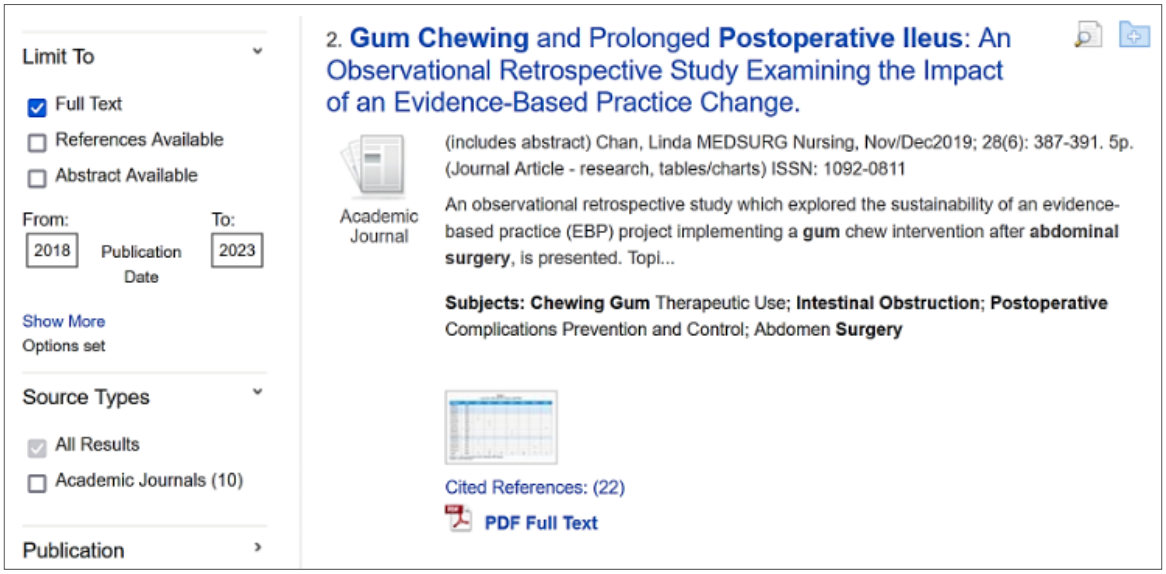

Fig. 8

Step 7: Assess the Evidence

The final step to the perfect PICO search is to determine the level of evidence within each relevant article. In searching for the best available evidence, a hierarchy exists regarding the level and strength of evidence. As you review the journal articles, select those that are based on highest level of evidence, such as a Meta-Analyses or a Systematic Review. Fig. 9

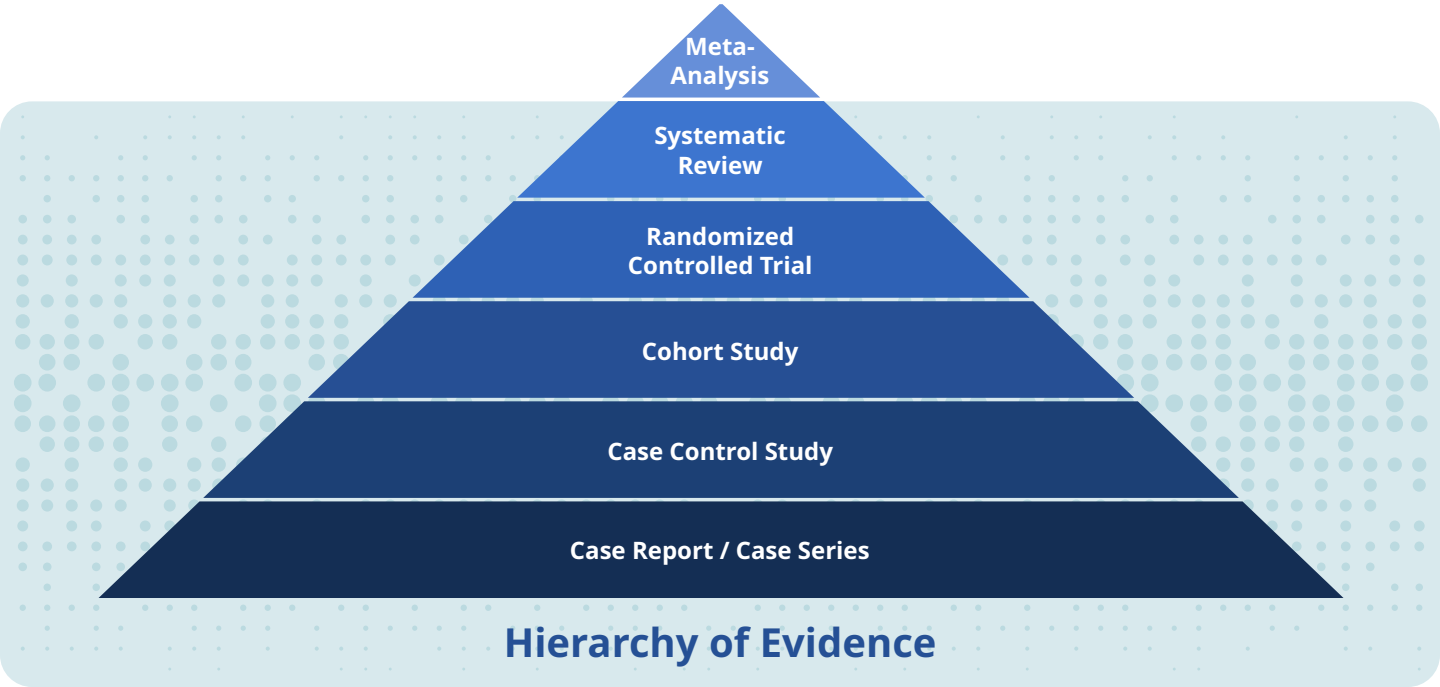

Fig. 9

Studies Defined

Meta-Analysis: A systematic review that uses quantitative methods to synthesize & summarize results.

Systematic Review: A summary of the medical literature that uses explicit methods to perform a comprehensive literature search & critical appraisal of individual studies.

Randomized Controlled Trial: Participants are randomly allocated into experimental, or control groups & are followed over time for the variables/outcomes of interest.

Cohort Study: Identifies participants who currently have a certain condition or receive a treatment and are followed over time & compared with another group of people who are not affected by the condition.

Case Control Study: Identifies participants who have a certain outcome (cases) & participants without that outcome (controls).

Case Report/Case Series: A report on one or more participants with a particular outcome.

(Adapted from CEBM - Centre for Evidence-Based Medicine)

The PICO Search Bar — CINAHL Ultimate

The CINAHL Ultimate Database also offers a PICO Search Bar, perfect for a cursory PICO search. Individual keywords are utilized, without synonyms. Click on the PICO Search button to access the PICO Search Bar in the basic or advanced search mode (Note: If you do not see the PICO Search button, please contact Customer Support). *Fig. 10*

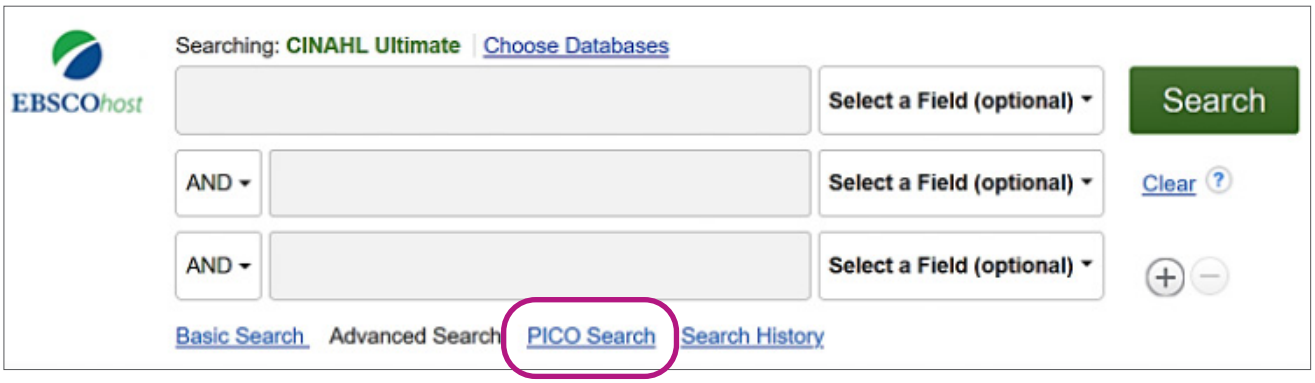

Fig. 10

When the PICO Search Box opens, simply type in your keywords, and submit. The results may yield fewer articles, but this is a great way to get the relevant information fast. *Fig. 11*

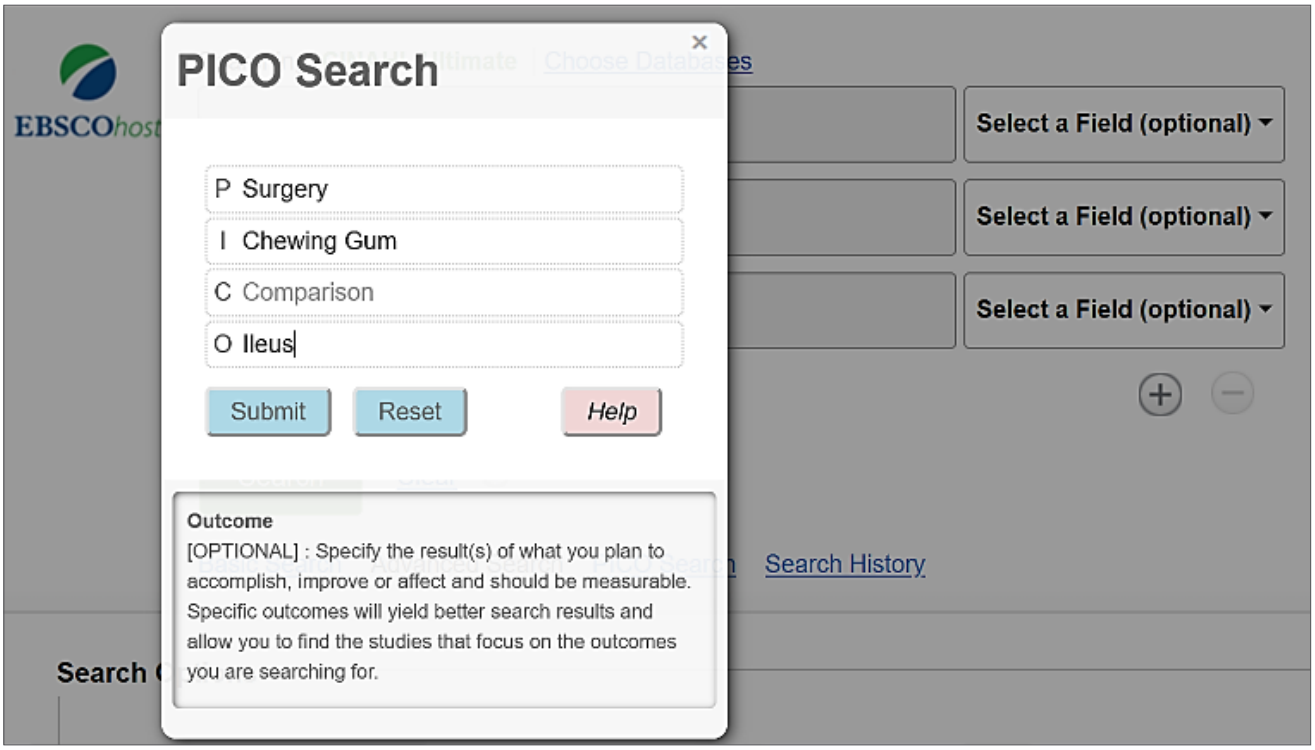

Fig. 11

Conclusion

Fostering a culture of evidence-based nursing practice within a hospital is no easy task. It involves the integration of clinical expertise, patient values, and the best research evidence (Sackett D, 2002). The actual search for high quality clinical research evidence can be overwhelming to many. By utilizing the PICO format, the search process will be streamlined and will yield the best available evidence to support clinical decisions and explore alternatives.

Kathy Jensen, MHA, RN
Nurse Consultant
EBSCO Health Care

10 Estes Street
Ipswich, MA 01938
E: kjensen@ebsco.com

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