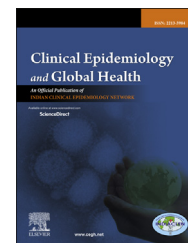




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Continuing Education

Reading systematic reviews to answer clinical questions

Anke Rohwer^{a,*}, Paul Garner^b, Taryn Young^{a,c}^aCentre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University, Francie van Zijl Drive, Parow 7500, South Africa^bLiverpool School of Tropical Medicine, UK^cSouth African Cochrane Centre, South African Medical Research Council, South Africa

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ABSTRACT

Healthcare decisions need to be informed by reliable research. This requires practitioners to phrase clear questions when being faced with a knowledge gap, find the evidence that will best answer the question, critically appraise the evidence for validity and reliability and apply the findings to the unique setting. Systematic reviews are often the first point of reference when seeking healthcare answers.

This article provides a short guide on finding, reading and interpreting systematic reviews, as well as applying the results, illustrated by a clinical scenario (multiple micronutrient powders for health and nutrition in children under two years of age).

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1. Introduction

You are a healthcare professional working in a rural area. A woman and her 12-month old boy come for a routine check-up. She mentions that she has introduced solid food to the baby's diet, after having exclusively breastfed him for 6 months. His diet consists mainly of porridge, since the woman is a single parent on a low wage and cannot afford much. You are concerned about the risk of anaemia and enquire about the use of any form of vitamin supplements. She answers that she was told to give him iron drops at her previous visit, but that he does not like the taste and refuses to eat anything that contains the drops. So she stopped using the drops months ago. You remember that you have recently listened to a presentation on the use of powders containing iron and a variety of vitamins at a conference, and wonder whether the use of these micronutrient powders would be an effective way to supplement his diet, in order to

prevent anaemia. You decide to find out what research evidence exists before making recommendations about its use.

Which study should you be reading? Where will you find a suitable study? In the past you might have turned to expert opinion, a text book, or sought for a relevant study on MEDLINE. However, over the last 20 years, good evidence has emerged that expert opinion and text books, based on expert opinion, may be wrong and out of date. What is more, whilst one study may help inform your answer, it is important that decisions are made based on the totality of the evidence around a particular question. For this, you will need to access a systematic review of all relevant evidence, critically appraised and summarized. So skills in finding, reading, appraising and interpreting systematic reviews are critical to health professionals in staying up to date and using the best research evidence in their decision making.

* Corresponding author. Tel.: +27 21 938 9886; fax: +27 21 938 9743.

E-mail address: arohwer@sun.ac.za (A. Rohwer).

In the following article, using the scenario above as an example, we will attempt to answer these questions and provide you with a short guide of systematic reviews – what they are, why read them, where to find and how to read them.

2. What is a systematic review?

A systematic review is a study “in which bias has been reduced by the systematic identification, appraisal, synthesis, and, if relevant, statistical aggregation of all relevant studies on a specific topic according to a predetermined and explicit method”.¹ The key characteristics of a systematic review include a clearly stated set of objectives with pre-defined eligibility criteria for studies; explicit, reproducible methodology; a comprehensive systematic search that attempts to identify all studies that would meet the eligibility criteria; an assessment of the validity of the findings of the included studies; and a systematic presentation and synthesis of the characteristics and findings of the included studies.^{2,3}

3. Why do we need to read systematic reviews?

Evidence-based medicine, according to David Sackett (1996) is “the conscientious, explicit and judicious use of the current best evidence in making decisions about the care of individual patients”.⁴ It therefore means incorporating the current, best available evidence to help answer our questions in clinical practice. Systematic reviews are considered an excellent source of evidence, and are often the first point of reference when seeking healthcare answers.

4. Where does one start?

Before we can find an answer, we need to have a clearly formulated question. The five steps of evidence-based health care (EBHC) are a very helpful process when being faced with a knowledge gap: It requires us to ask an answerable question; access the literature to find an answer to this question; critically appraise the literature for validity and reliability; apply the results to our practice and lastly evaluate our practice.

Phrasing clear questions is a key first step. Structuring the question in a way that incorporates all the essential elements, helps us to find relevant information that can answer our question. A widely adopted format for phrasing questions is the “PICO” format, where the “P” stands for the population, patient or participant; the “I” for the intervention; the “C” for the comparison; and the “O” for the main outcome of interest.³

Thinking back to our scenario, the “PICO” would thus be:

P: 12-month old at risk of developing anaemia

I: routine supplementation with micronutrient powders containing minerals and vitamins

C: no routine supplementation

O: anaemia

The corresponding question would thus be: *In infants at risk of developing anaemia, does routine supplementation with micronutrient powders containing minerals and vitamins, compared to no routine supplementation, reduce the incidence of anaemia?*

In addition to the information about the population, intervention, comparison and outcomes (PICO) in questions, it is imperative that we are clear about the type of question we are asking. This is important since it will determine the type of primary study that will best answer our question. Since our question is a question on treatment or prevention, the best study design to answer this question would be a randomized controlled trial (RCT).

A systematic review is even more useful than the best single study to answer a question, since it aims to find all studies relevant to the question at hand. It therefore gives us a more holistic picture of the current evidence and the various studies that have been done. The most well-known and probably most commonly used, are systematic reviews of healthcare interventions, answering questions about effectiveness of medical interventions. Systematic reviews can also summarize other types of studies providing answers to questions of risk factors,⁵ diagnostic accuracy,⁶ incidence⁷ or prevalence⁸; and qualitative studies.⁹

Further examples of PICO questions and references to systematic reviews that can be consulted to answer these questions are presented in [Table 1](#).

5. Where can we find systematic reviews?

After having phrased a clear question, we need to find the best available evidence. Since a systematic review is considered best evidence, we need to attempt to find one that would answer our question. If no systematic review is available, we can look then for single, primary studies that would answer the question.

When searching for systematic reviews, it is helpful to use the PICO elements as keywords, combining them with Boolean operators (AND, OR, NOT). Adding synonyms to the keywords will broaden the search and will decrease the chance of missing important studies.¹⁰

The Cochrane Database of Systematic Reviews is the best place to start looking for systematic reviews of healthcare interventions. We searched *The Cochrane Library* using the following keywords in our search: *infant AND (micronutrient OR vitamin) AND anaemia* and found the following systematic review:

De-Regil LM, Suchdev PS, Vist GE, Walleser S, Peña-Rosas JP. Home fortification of foods with multiple micronutrient powders for health and nutrition in children under two years of age. *Cochrane Database of Systematic Reviews* 2011, Issue 9. Art. No.: CD008959. DOI: [10.1002/14651858.CD008959.pub2](https://doi.org/10.1002/14651858.CD008959.pub2).¹¹

The TRIP database (www.tripdatabase.com) is another very useful database, since it filters the search according to synthesised (systematic reviews, guidelines) and primary research. It also allows you to enter the PICO components of your question in a very user-friendly manner.

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