

Systematic Reviews: are they Real Evidence?

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Since the emergence of evidence based medicine in the early 90s of the past century, systematic reviews has gained great importance in medical practice. Being a summary of valid literature, systematic reviews became the cornerstone of generating evidence and the fundamental basis of building up practice guidelines all over the globe. Therefore reading systematic reviews is a principal skill for medical practitioners who need to offer the best care to their patients. Reading a systematic review appears easy because most of medical practitioners read only the conclusion of the review to know the best care in a certain clinical situation; and this takes only a few seconds. However, systematic reviews are not holy books. Systematic reviews are human products and are actually one type of research, carrying the potential risk of bias and flaws. Therefore it is inappropriate to think that systematic reviews are always the correct facts in medicine. Authors of systematic reviews have many ways, intentionally and unintentionally, to conclude false evidence and to twist the review results towards certain direction. Thus, systematic review readers must be alert during extracting evidence and should know how to immune themselves from falling in such a mistake. When reading a systematic review, the reader must be aware of some points before deciding to take the results of this review as evidence. These points may not appear in the abstract or the conclusion, and the reader must search for them to explore whether the review represents real evidence or not.

First, how many studies included in the review? Systematic reviews that include one or 2 studies are definitely insufficient to generate evidence, even if all studies has the same conclusion without any heterogeneity. In other situations, the review may include a

reasonable number of studies, but it also includes a large number of outcomes, thus each outcome has one or 2 studies in the meta-analysis and this is again insufficient number of studies to generate evidence.

Second, what are the types of included studies? For example, it is well known that randomized controlled clinical trials (RCTs) are the most powerful studies to be included in an interventional systematic review. This is because RCTs have relatively lower risk of bias than other designs, and they are at the top of the hierarchy of study design strength. Thus interventional systematic reviews that include non-randomized controlled studies have generally weaker evidence, and those including cohort studies are weaker and so on. Therefore the reader must explore this point carefully to determine the strength of extracted evidence.

Third, how much the risk of bias across the included studies? Appropriately, the systematic review author(s) must carefully examine the risk of bias for all included studies and report this issue in a table and a graph in the review. Ideally, all the included studies should have low risk of bias. If the included studies have high risk of bias, the reader must take the results of the review cautiously. Forth, did the authors do subgroup analysis, or the review results represent only the overall effects? Some outcomes differ according to certain conditions like age, gender, obesity...etc. In these situations, reporting the overall effect is inappropriate because it actually represents a mixture of heterogenous effects, and if the review authors didn't perform subgroup analysis, the reader should take the results cautiously.

Last but not least, did the authors perform sensitivity analysis? In some reviews, one study may have contradictory results to all included studies, but because it has large sample size and extreme results it drags the result of the whole meta-analysis towards its direction. Therefore the meta-analysis result reflects solely the result of this study. In this situation, the review authors must report this neatly to the reader, and to do the meta-analysis once after including the study and once after excluding this study to show the results in either situation. This is termed sensitivity analysis and this step is very important to offer the real situation to the reader.

In conclusion, reading a systematic review is not simply reading the conclusion or even the whole abstract. To explore the real evidence, the reader must have the tools and skill of appropriate reading of systematic reviews not to be deceived with false evidence that may even harm clinical practice.

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