Supplement to
Health-related Scientific Articles in the 21st Century
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APPLYING THE TEMPLATE TO A LITERATURE REVIEW

Authors of literature reviews sometimes ask,

"How can I apply the Template to my literature review?"

The writing strategy of a literature review is, with three exceptions, similar to a retrospective analysis of data from an existing database. Here I explain the three exceptions.

(1) We must create our own database.

We establish our own database by establishing search criteria and then searching. After an initial search, we usually reject those articles that do not seem to be relevant or credible. The result of this is a database of various articles published by various authors reporting various types of studies. From these articles we select the quantitative and/or qualitative data that seem to be relevant to our study. In contrast to selecting an existing database (such as in the malaria example), establishing our database is a very subjective process. This is an inherent characteristic of literature reviews. And this has consequences for the credibility of our review. Therefore, we want to report how we minimized selection bias in our subjective process.

(2) Research questions are quite different from those in other types of studies

Before starting our study, we do not know what we might find. Our research questions, therefore, are usually rather open and general. Our first question, for example, might be, "What variables and the relationships between them have been reported?" or, "Has evidence been reported that link XXX and YYY?". Note that such questions focus on *what has been reported.* In an analysis of data in an existing database, the research question usually focuses on factual relationships between variables in the database.

(3) Data are quite different from those in other types of studies.

In studies of quantitative data, such as in an existing database, our *results* include only factual findings. The data of a literature review include also the subjective interpretations of the authors of the articles. This implies that there are more uncertainties in the data of a literature review. Therefore, in the Discussion section we discuss the consequences of these uncertainties.

A FICTITIOUS EXAMPLE OF CORE THE CONCEPTS APPLICABLE TO A LITERATURE REVIEW

Suppose, for example, our purpose is to help clinicians more effectively diagnose and treat patients with a specific disease, let's call it AAA. In the example below, I have added comments between square brackets.

Introduction section

Our Introduction defines the scope of the study in four core concepts: our take-home messages that clinicians will understand.

Core concept 1: the health-related problem

Clinicians that suspect a patient has AAA are faced with a dilemma: no easily accessible information is available to guide them in diagnosing AAA. Furthermore, if diagnosed, no comparative summary of treatment outcomes is available.

Core concept 2: our strategy

To help clinicians diagnose AAA and make effective treatment decisions, an accessible summary of research and clinical outcomes related to AAA could be valuable. As a first step toward this goal, we systematically reviewed literature related to AAA.

Core concept 3: our research questions

For this literature review, we focused on the following research questions related to diagnostics and treatments of AAA. (1) What risk factors of acquiring AAA have been reported? (2) Do authors agree regarding these factors? (3) What clinical treatments/interventions have been reported? (4) Do authors agree on their effectiveness?

[Note that these open questions imply various possible answers. Furthermore, these are specific questions that narrow the scope of the study.]

Core concept 4: the general study design contains 4 take-home messages

(1) To answer our research questions, we searched PubMed and … using the search terms AAA, BBB, CCC and DDD.

(2) From the set of articles found, three of us (you and two co-authors) independently assessed their credibility and relevance. Differences of opinions were resolved by consensus meetings.
(3) From the remaining articles we tabulated quantitative and qualitative data including the authors' interpretations.
(4) After independent subjective analysis of the data, we held consensus meetings. This led to our conclusions reported and discussed in the Discussion section.
[Such messages should appear at the end of the Introduction. This helps readers to quickly understand the scope and credibility of our study design without reading the technical details in the Methods section. Each of these messages, of course, must be supported by details in our Methods section.]

A word about the Results section

Our Results section should report all the quantitative and qualitative data we found in the final set of articles that we reviewed. Usually we have a wide range of authors in different fields, ranging from basic research to clinical case report. For our review, we can best present this data—including the authors' interpretations—in tables. Because of the wide range of findings, summarizing this (core concept 5) is neither easy nor effective. Therefore, I suggest leaving this out.

Discussion section

In our Discussion section we present our subjective interpretations of the factual findings (Results section). By doing this, we clearly separate the factual findings from our subjective interpretations and conclusions. Just like in other types of health-related articles, our interpretations give meaning to the factual findings. This we do in core concepts 6 through 10.

Core concept 6: our answers to our research questions

Three risk factors of acquiring AAA have been reported by three authors: XXX, YYY and ZZZ. Two authors did not agree on ZZZ. This suggests that XXX and YYY may be risk factors.

Treatments reported for AAA include T1, T2, T3 and T4. The authors' agreement on T3 suggests that T3 is the most effective. However, due to side effects, we do not consider it to be optimal.

[Note that our subjective interpretations of the findings are present tense. Also note that each research question is specifically answered by using the same words we used in stating the question. Furthermore, with words like, "suggests "and "seems to be" we acknowledge that our answers are subject to uncertainties.]

Core concept 7: the support of our answers

After a brief answer to our research questions, we need to support those answers with a discussion of the details of the findings reported in the Results section. I do not give an example here; this would be too much speculation of details.

I suggest organizing this part of the discussion around each research question.

Core concept 8: the uncertainties of our answers

All interpretations of findings, including those of the original authors as well as our own, are subject to uncertainties. Uncertainties are due to uncontrollable and unknown factors, selection bias etc. Inherent to literature reviews, outcomes are subject to many uncontrollable variables. We do not know the validity of the data collected by the original authors, or the possible selection bias. If the original data include patient or animal data, we may not know the individual characteristics, or how that data was collected. Qualitative findings such as interviews, patient-reported outcomes, clinical opinions etc. are fraught with uncertainties.

The credibility of our review depends upon openly discussing the various causes of uncertainties and their possible consequences. Note in core concept 4, we mentioned how we minimized our own selection bias. We could further discuss this here.

Conclusion section: a subsection of the Discussion

Here we present two take-home messages: the value of our literature review (core concept 9) and our speculation on how we might give direction to further research (core concept 10).

Core concept 9: the value our work

Our goal was to provide accessible information to clinicians for diagnosing AAA and prescribing effective personalized treatment. Our literature review takes a first step toward that goal: BBB, CCC and DDD are possible risk factors for acquiring AAA, and T1, T2 and T3 are current treatments. Although these risk factors and efficacy of the treatments need to be validated, clinicians might gain some guidance by screening their AAA patients for these risk factors and by personally evaluating the reported treatments.

[Note, that we come back to the problem stated in core concept 1. Here we point out the value of our new knowledge: a step towards solving the problem. Although small, that step is the value of our research.]

Core concept 10: speculations

These risk factors and the effectiveness of personalized treatment may relate to patient-specific characteristics. If so, screening patients for these risk factors could provide clinical guidance for effective personalized treatment.

[Note, here, we step outside the scope of our study (a literature review) and give direction for further research. Be imaginative.]