Reviewer’s report

Title: Ten Recommendations for Using Implementation Frameworks in Research and Practice

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Reviewer: Bethany Kwan

Reviewer's report:

Summary: This paper outlines 10 recommendations for applying D&I frameworks in the context of "implementation efforts." Overall, the paper is well-written, addresses an important gap in the science and practice of D&I, and recommends concrete tools to guide application of the proposed recommendations. I have a few general critiques and suggestions:

As noted by the authors, the order and relevance of these 10 steps can vary - and likely depends on the purpose of the study. What guidance might you provide on the order and relevance for different types of implementation science projects? For instance, this order looks right for those who are at the stage of developing and testing implementation strategies - but those who are earlier in the process, perhaps at the point of trying to determine implementation determinants, may not be able to produce process or logic models or articulate mechanisms yet. This doesn't mean a framework isn't very informative at this stage, but the steps and their order would vary. It could be really helpful - especially for more junior D&I scientists - to indicate when each step may be especially relevant. As it stands, I think the list could be overwhelming and it would be difficult for users to know what to use and what not to use.

I can see the pros and cons of always using EPIS as the exemplar framework for each Step. The consistency does aid in understanding and cognitive processing - and the authors are quite experienced in the application of EPIS. However, there are other types of frameworks that are much better suited for certain steps. Perhaps the exemplar frameworks at each step could extend beyond EPIS to include a determinant and an evaluation framework as well - especially those that pair nicely with EPIS.

Specific critiques and suggestions:

1. Page 5, lines 39-55. This content nicely mirrors the categories of frameworks as described in the D&I frameworks chapter in Brownson et al (process, determinants, and evaluation frameworks), but does not explicitly use that terminology. It would be helpful here to introduce that terminology to describe the various categories of frameworks (with examples of each), and then refer to this terminology later when explaining each of the 10 steps. For instance, you might say, "Process models such as EPIS and REP are particularly well-suited to Step 2, engage stakeholders." Or "Determinant frameworks are particularly well-suited for use in Step 6, determine implementation determinants." (The framework categories are indeed referenced under Step 1, but are not previously defined.)

2. How might you address the use of hybrid or custom frameworks - e.g., combining process models and determinant frameworks - for different aspects of a project?

3. Page 6, line 1: Please clarify, what makes use of a framework "suboptimal"?

4. Page 6, line 23: Please define what is meant by an "implementation effort."

5. Page 7, lines 21-25, "the framework's orientation, for example the setting....": This wording is a bit confusing. Please rephrase.

6. Page 8, EPIS application: In selecting a framework, how might one determine that a framework is NOT a good fit or should be ruled out? How about an example showing how a particular framework would NOT fit a particular context?

7. Page 9, step 3: This paragraph is great! I would love to see this step introduced sooner (perhaps...
even first). I think it helps set the context for the rest of the steps and aids in reader understanding. It also nicely shows that there are many research questions that could be relevant depending on the stage of the research or the state of the evidence around a particular EBP or IS.

8. Page 10, line 4, "the selection of the BCW as a guiding framework necessitates for a question or issue to be described in behavioral terms and, in many cases, refined to be more specific." : This sentence is a bit awkward. Please clarify what it means for a question or issue to be described "In behavioral terms" and what would be entailed in refining an issue to be more specific.

9. Page 10, lines 9-10, "Frameworks also provide guidance for the translation of implementation literature to research or evaluation questions." Please clarify what "translation of implementation literature to research or evaluation questions" means.

10. Page 10, Step 3 EPIS application: Please clarify - it is difficult to tie this example to the "step" in #3.

11. Page 11, Step 4 EPIS application: EPIS may not serve as the best example here. What specific determinant framework was used in this case?

12. Page 12, lines 27-30, "Beyond identifying and analyzing key implementation determinants, there are frameworks that describe important implementation mechanisms and their associated impacts across the phases of implementation processes": It is unclear how this relates to the research and evaluation method step.

13. Pages 14-15, Step 8: This section is really strong. I really appreciate the citations from a variety of published studies representing this step. It seems the evidence here is much stronger than for other steps. Is that the case? If other steps have a weaker evidence base, please comment on this as an opportunity. If not, then it would be really helpful for the other steps to have a similar discussion of (non-EPIS) examples from the literature.

14. The tools (Tables 1 and 2) appear to be useful worksheets for study planning. Some of the questions appear to be redundant or overlapping, and may be somewhat confusing. While it was noted on page 6 that stakeholders were engaged in reviewing the recommendations, it does not explicitly state that the tools underwent review by stakeholders. Was any user testing done on the tools? Methods and results of user testing, and demonstrating refinement of the tools based on that user testing, would significantly strengthen this paper.

15. There are a few questions in Table 1 that are confusing or need to be more specific, which would likely be discovered in user testing. For example, Step 2, "How can the selected implementation framework(s) be used as a tool in engaging stakeholders in this implementation project? (i.e., as a simplified and therefore appealing and intuitive representation of the implementation process)" and "How can the selected implementation framework(s) be used to determine the roles and activities of stakeholders within and across the implementation phase(s)?" - this is confusing. In what sense would a D&I framework guide stakeholder roles and activities? Same for the questions in Step 5 - in what sense would a framework guide study design, etc? In Step 8 - "Given the framework(s) and determinants selected, what evaluation method and measures are being employed to measure determinants and changes in determinants over time?" - this seems to fit better with Step 6. (Minor detail in step 9, "How can the selected implementation framework(s) inform tailoring and adaption…" should say adaptation, not adaption.

16. For Table 2, what is the purpose of the ratings? How would they be used? For instance, is more always better or does the extent to which the framework is used for each specified domain depend on the needs of the project? How might the scale responses capture this?

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