Peer Review File

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Reviewer A

Comment 1:
This is a well written paper which presents a classification scheme or taxonomy for digital health interventions (DHIs) in mental health.
Reply 1:
Thank you.

Comment 2:
The authors suggest (rightly) that one of the aims of a taxonomy is to group similar DHIs together for the purposes of evidence synthesis/ systematic review and meta-analyses. While I agree with this aim - I don't believe that the author's 4 Type classification will achieve this given the considerable heterogeneity within Types and overlap between categories. In particular, there is no clear boundary between Type 2 'live interventions with adjuncts' and Type 3 'supported self-help interventions'. For example, the difficulty in allocating therapist-guided CBT interventions as either Type 2 or 3 illustrates this point - and as the authors state, this is a 'gray area' (ln 319-325).
Reply 2:
We have clarified the four types of digital mental health interventions and in particular, we have reorganized the section on type 3 interventions to make the differences clearer (see lines 433-449).

Comment 3:
It would be helpful if the authors could agree on a terminology for these interventions. I would suggest using either DHIs or digital mental health interventions (DMHIs) which are terms increasingly adopted in the literature.
Reply 3:
We will use the term Digital Mental Health Interventions (DMHIs). We replaced the current term of "digital interventions" to be specific to Digital Mental Health Interventions (DMHIs) when appropriate throughout the paper.

Comment 4:
Although mental health conditions and outcomes are the predominant focus of the paper - in a few instances (ln 216; re: diabetes and ln 430; re: smoking cessation) the paper strays into physical health behaviour change interventions. This doesn't fit with the overall theme and scope of the paper.

Reply 4:
We will focus on mental health digital interventions, therefore, we have removed the reference to diabetes (line 343). According to the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders), tobacco use is a mental disorder, therefore, we will leave these studies in the paper.

Comment 5:
I don't entirely agree with the author's statement (ln 491-493) that Types 1 and 2 refer to interventions provided by a health professional or lay healthcare worker - as contrasted with Types 3 & 4 which are self- help only and are provided outside the healthcare system. Clearly, there are examples of DHIs within all 4 Types that can be prescribed/ delivered by the healthcare system.
Reply 5:
We have updated the statement to make clear the differences between the 4 types (see lines 749-753). This is also made clear within the abstract. In particular, if Type 3 or 4 interventions are embedded in services by a health care system, they would become part of Type 2 interventions.

Comment 6:
The authors state that Type 1 (Telehealth) is only delivered as synchronous communication. However, an example of asynchronous text based CBT telehealth is provided by Ieso Health's approach.
Reply 6:
We have clarified that Type 1 and Type 2 interventions can be delivered asynchronously or synchronously within the Type 1 and Type 2 sections as well as the Table 1 summarizing the four types and the newly added Figure 1.

Comment 7:
The terminology for Type 3 and Type 4 is confusing with the terms 'guided' and 'self-help' in the same title. I would suggest calling Type 3 "Human supported/guided interventions" and Type 4 "Self-guided interventions"
Reply 7:
We have revised the terminology to make clear the differences between the 4 types of DMHIs. To make Type 3 DMHIs even clearer, we have defined these separately as Type 3A and Type 3B within the Type 3 section (see lines 441-449).

Comment 8:
ln 412; chatbots should be included in Type 4.
Reply 8:
We have modified our text as advised and added chatbots in the sentence (see line 600).

Comment 9:

Type 2 refers to adjunctive digital therapy. The terms 'blended' or digitally-enabled' therapy is increasing being used to refer to this integration of traditional face-to-face care and digital interventions.

Reply 9:

We have included the term “blended” in our description of type 2 DMHIs.

Comment 10:

the title of Table 1. includes '...Health Digital' should this be 'Digital Health...'?

Reply 10:

Table 1 has been updated with updated Type descriptions and the title has been corrected.

Reviewer B

Overall, I think the described taxonomy is a helpful tool that will add valuably to the field of digital health promotion and treatment, and therefore should be published. I applaud the awareness of potential for inequality in digital interventions and the ambition to reduce it. However, I have a number of concerns that would need to be addressed before I would deem it 'fit' for publication.

Overall:

Comment 1:

There seem to be a few non-congruent aims with this taxonomy. The title suggests focus on better sorting/reporting of digital tools (i.e., proposing a new taxonomy), while also referring to reducing health inequalities. Does this suggest that the taxonomy should only be used to describe literature specifically aiming to do this? Mental health is not mentioned in the title at all, yet it is central to your illustrations of the framework. I would suggest narrowing the focus only to the new taxonomy, and rephrase the title/abstract to emphasise using mental health tools as an example (e.g., "Updated Taxonomy of Digital Health Tools: A Conceptual Framework illustrated in the area of Mental Health").

Reply 1:

The title has been changed to "Updated taxonomy of digital mental health interventions: A conceptual framework" to make it clear that our focus is on the proposed taxonomy and mental health. We have clarified in the text that the taxonomy is encouraged to be used to categorize Digital Mental Health Interventions in a cohesive manner (see lines 728-747), but we also talk about how the taxonomy can be used to address the needs of underserved populations (see lines 838-846). We believe that it is important to highlight the needs of underserved populations within the context of this taxonomy and paper.

Comment 2:

Along the same lines, the authors need to make a better distinction between the general framework (referring to digital interventions in general) and the mental health literature example they have decided to use. I suggest doing this explicitly towards the end of the introduction section (lines 120-130), but continue to refer to mental health as the example throughout the manuscript.

Reply 2:

We have made it clear throughout the paper that we are focusing on digital mental health interventions (DMHIs), which also addresses a comment about this issue from another reviewer.

Comment 3:

There are many unsubstantiated claims throughout the manuscript that need to be referenced. For example, statements in lines 39, 48, 118-120, 149-150, 253-255, 299, 335-336, 520-522, 529,

536, 544-545, 298 all
state facts and require evidence for them. This is a core part of scientific writing and reporting and simply must be done.

Reply 3:

We have referenced the statements. Please see lines 62, 70, 167-169, 102-105, 435, 518-519, 796-797, 812-
813, 824-26, 836.

Abstract

Comment 4:

Cite the previous taxonomy you refer to. Citations are appropriate in the abstract where central to the present work.

Reply 4:

The citation has been added to the abstract.

Comment 5:

Make it clear how the present taxonomy is different from the previous one and how it enhances the field.

Reply 5:

Lines 133-139 specify the difference between this updated taxonomy and the previous one.

Introduction

Comment 6:

I would like to see a more thorough rationale for why this taxonomy is needed. This could include providing statistics on increase in digital service provision, number of academic publications reporting on them, or calls from major health/governmental bodies. Convince the reader that this taxonomy will solve a problem in the digital health intervention literature.

Reply 6:

We have created a section on the "How the proposed taxonomy fits within the WHO taxonomy" to provide additional rationale for this taxonomy (see lines 189-198).

Comment 7:

Lines 60-63: If you are referring to specific interventions reducing incidence/prevalence of specific conditions, cite them. If not, make it clear that you are describing what either type of intervention aims to do.

Reply 7:

We made it clear that we are describing what preventive and treatment interventions aim to do (see line 79).

Comment 8:
Lines 110-116 & 121-124: These examples are interesting but could be made more concise and sound non- academic.
Reply 8:
We have redrafted these sections (see lines 158-166, 167-188).

Comment 9:
Line 131: Emphasising the need to conduct more research and tailor more resources towards under- represented groups is great, and I agree – but explain why this is the case (e.g., poorer health outcomes, higher incidence, fewer existing resources, …).
Reply 9:
We have added additional information to explain the need to conduct more research for underserved populations (see lines 203-207).

Body
Comment 10:
Lines 146-161: This paragraph explains the benefit of digital (over in-person) interventions. The listed benefits are legitimate, but the paragraph seems out of place in a taxonomy only considering digital interventions to begin with. Perhaps this is better placed integrated in the introduction, to demonstrate the need for more digital health tools (and consequently their structured reporting).
Reply 10:
We have moved this paragraph so it is integrated in the introduction (see lines 99-122).

Comment 11:
I recommend merging and shortening the sections on reviews and illustrative examples for each type of intervention. The value of this section is to summarise the evidence for this type of intervention (with reviews) and clarify which characteristics an intervention needs to have to be classified as this type (with individual studies). I think this can be done in a single paragraph for treatment and another one for prevention, for each of the four types. Doing this will make your manuscript easier to read and keep the focus on the taxonomy itself (rather than focusing too much on the review aspect, which is beyond your scope and arguably deserves its own publication).
Reply 11:
We have shortened the sections and kept illustrations to one or two per type of intervention.

Comment 12:
In some cases (e.g., sections 2.1.2, 4.3), you only report pilot/feasibility studies as examples. These types of studies cannot reliably inform us of the intervention effectiveness, so do not provide the most illustrative examples. If there are no full-scale studies out there to report as

examples, this can be mentioned and feasibility examples given.

Reply 12:

We explained that full scale DMHIs studies are needed (see line 319).

Comment 13:

At times, it would be good to have fewer examples and make sure sufficient information is given with each one, rather than just listing them (e.g., end of sections 2.1.3, 4.2, 5.2).

Reply 13:

We have provided one or two examples for section type. Any additional examples are included in the tables but not in the text.

Comment 14:

Line 310: It is entirely subjective to describe a piece of work as “the best summary of this literature to date”. Remove this claim or substantiate why you believe this is the case (and how it is relevant to the paper).

Reply 14:

The section where this sentence appeared has been reorganized and we have removed the claim (see lines 434-449).

Comment 15:

Lines 350-351: Promoting greater inclusivity and cultural adaptations of interventions is commendable (I agree myself), but seems beyond the scope of this paper. If the reduction of inequalities is central to the taxonomy itself, this needs to be better illustrated (see comment 1).

Reply 15:

The focus of this paper is on the taxonomy, therefore we removed the sentence about the cultural adaptations (see line 529). We have added a paragraph in the discussion section to talk about how we can use the taxonomy to address the needs of underserved populations (see lines 838-846). We think it is important to talk about the needs of underserved populations whenever this is relevant, including within this paper.

Comment 16:

Section 5.2: This section gives disproportionate detail on the intervention design, funding and other study characteristics, which are not given for any other example study. The section sounds much more subjective than the rest of the manuscript and needs to be edited to describe Muñoz and colleagues’ work objectively, focusing on key intervention characteristics and findings.

Reply 16:

This section has been edited to focus on key intervention characteristics and findings (see lines 669-679).

Comment 17:

Line 461: stating that "interventions were effective in preventing" a number of disorders is misleading. Reword to be more precise, for example by stating the timeframes the review looked at, or saying the interventions "reduced incidence".

Reply 17:

We have updated this section and included a quote about the outcome directly from the review (see lines 714-716).

Discussion

Comment 18:

The opening paragraph summarises the taxonomy well, but provides confusing guidance on what researchers should report. I suggest you end the paragraph by suggesting researchers in the field to report

i) Type of intervention according to your taxonomy, ii) whether it is consumable or not, iii) whether it is a preventative or treatment intervention (rather than just point i) suggested at present).

Reply 18:

We have ended the paragraph as suggested (see lines 760-762).

Comment 19:

Lines 525-530: This paragraph discusses Type 4 interventions but over-states their upsides. I would like to see some acknowledgement that digital interventions themselves can promote or widen inequalities and are not equally effective for everyone (see Western et al., 2022, for review). Additionally, the claim that they come with "no limitations" is false. Many digital interventions maintain a paywall, or are only available in certain parts of the world, or only on certain devices. Please acknowledge and discuss this in the discussion. **Reply 19:**

We have added a whole paragraph to acknowledge the potentially harmful effects of digital interventions (see lines 814-827).

Comment 20:

Lines 557-558: Encouraging researchers to "share the ones found effective" could be seen as encouraging selective reporting or biased research practices. Reword to convey that null results are important and valuable to report as well.

Reply 20:

We have clarified this point to note that we encourage researchers to share all their findings in the literature, but to share with people via the internet those DHMIs that have been found effective (see line 863-866).

Tables:

Comment 21:

Table 1: Provides a good summary of the taxonomy. Perhaps could be made into a graphic, to

help the taxonomy gain visibility? (Optional)

Reply 21:

We have created a graphic (Figure 1) to provide a visual summary of the taxonomy.

Comment 22:

Table 7: The recommendations you give here reflect the confusion with focus/aim of the manuscript I refer to in comment 1. You recommend a mix of taxonomy-specific practices (suggestions 1-4), better reporting practices (sugg 5, 9), and general directions for the field (sugg 6-8, 10). This seems unstructured and beyond the scope of the present work. I recommend removing this table and incorporating the main actionable points (1-4) into the discussion, whereas the rest can be discussed elsewhere in discussion or in future publications.

Reply 22:

We removed table 6 and discussed the main actionable points in the discussion section.