PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

Title (Provisional)

Digital Health Technologies and Self-Efficacy in Parkinson's: A Scoping Review

Authors

Hall, Andrew Michael; Allgar, Victoria; Carroll, Camille B; Meinert, Edward

VERSION 1 - REVIEW

Reviewer	**1**
Name	**Sinha, , Krishnendu**
Affiliation	**Jhargram Raj College**
Date	**06-Jun-2024**
COI	**NA**

The scoping review "The impact of digital health technologies on self-efficacy in People with Parkinson's" provides a comprehensive overview of the literature, addressing a critical and timely topic. The thorough search strategy, use of the PRISMA ScR framework, and inclusion of various study designs contribute significantly to its robustness. The well-structured review highlights important findings that can guide future research and practice.

Strengths of the Review

1. Comprehensive Database Search: The review's extensive search across multiple databases (MEDLINE, Embase, PsychINFO, CINAHL, Web of Science, IEEE Xplore, and Google Scholar) ensures a broad coverage of relevant literature.

2. Focus on Self-Efficacy: By concentrating on self-efficacy, the review addresses a specific and crucial aspect of self-management in Parkinson's disease that has not been extensively explored.

3. Use of PRISMA ScR Framework: Adherence to the PRISMA ScR framework and a published protocol enhances the transparency and reproducibility of the review.

4. Diverse Study Designs: Including various study designs (RCTs, pilot studies, feasibility studies, cohort studies, cross-sectional studies, and case reports) provides a comprehensive understanding of the field.

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5. Identification of Gaps: The review effectively identifies gaps in the current literature, offering valuable insights for future research directions.

Comments and Suggestions

1. Inclusion of PubMed:

Considering the extensive list of databases searched, including MEDLINE, Embase, PsychINFO, CINAHL, Web of Science, IEEE Xplore, and Google Scholar for grey literature, can you explain the rationale behind not including PubMed, a prominent resource for biomedical literature, in your search strategy?

2. Updating References:

Could you please update the reference list to include the most recent literature up to the current date in the revision? This will ensure the review is as current as possible.

3. Title Simplification:

The title could be streamlined to make it more straightforward and concise. One suggestion is "Digital Health Technologies and Self-Efficacy in Parkinson's: A Scoping Review." Additionally, in the abstract section, it would be beneficial to include a sentence in the background to emphasize the significance of self-efficacy in managing Parkinson's disease.

4. Discussion of Literature Gaps:

The identification of potential gaps in the literature is very helpful. However, a more detailed discussion of these gaps would be valuable. Could you please expand on this section to further facilitate research in this field?

Overall, the scoping review is a significant contribution to the understanding of digital health technologies in managing Parkinson's disease, specifically regarding their impact on self-efficacy. Addressing the above comments will further enhance the quality and clarity of the review.

Reviewer	**2**
Name	**Theodore Armand, , Tagne Poupi**
Affiliation	**Institute of Digital Anti-Aging Healthcare, Inje University**
Date	**11-Jun-2024**
COI	

The authors conducted a scoping review on the impact of digital health technologies on self-efficacy in People with Parkinson's. After the database search, the authors used PRISMA to select nine research papers for the final review. Though the research was conducted appropriately, I noted some points on which the quality of the manuscript can be improved:

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1- In the abstract, presenting the database search methods is insufficient. Clearly state the technique adopted in the paper

2—The authors clearly defined the self-efficacy concept following Bandura's protocol but did not do the same for DHT. The paper covered DHT superficially; I suggest a deeper definition and categorization of various digital technologies. (Page 13, line 55)

3 - Does the Effectiveness section (Page 14, line 31) stand for literature validation? If so, you should follow the PRISMA guidelines to validate the selected studies.

4—The discussion section must elaborate deeply. The actual description does not interpret and justify the results deeply.

Reviewer	**3**
Name	**Lee, JuHee**
Affiliation	**Yonsei University**
Date	**14-Jun-2024**
COI	**none**

This study reviewed digital health technologies on self-efficacy in people iwth Parkinson's which highlighted the importance of digital interventions. I think authors should consider revising belows. Thank you.

Your population was PwP (page 9), but you also included studies with the care partner of PwP in your inclusion criteria (page 10). I think you need more explanation about this for the readers.

Numbers are not matched with the Figure 1 and page 12 line 60. Records identified from Databases (n=27449) vs A total of 27499 records were exported

And in the Figure 1, 27449 were identified and duplicates (1266) and articles marked ineligible by automation (25793) were removed then the number should be 390. There is a need for more information to understand the record screened (n=97).

The table 2 need to be organized. Especially the Intervention description and key findings column needs more editing and summarizing to increase readability. And please use correct punctuations in the table.

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Page 18. In discussion, please elaborate on 'a sizable gap' mentioned in the discussion.

Also, more details are required to follow your argument on informing other clinical specialties.

It appears that the discussion section needs overall enhancement focused on self-efficacy and usability/satisfaction-pros and cons using this intervention.

Page 19 line 13, Please remove the period in the middle of the sentence.

Thank you.

VERSION 1 - AUTHOR RESPONSE

Response to decision letter uploaded as a PDF. Title has been modified based on peer-reviewed feedback.

Reviewer 1

Comment	Response and location
1. Inclusion of PubMed: Considering the extensive list of databases searched, including MEDLINE, Embase, PsychINFO, CINAHL, Web of Science, IEEE Xplore, and Google Scholar for grey literature, can you explain the rationale behind not including PubMed, a prominent resource for biomedical literature, in your search strategy?	Thank you for raising this pertinent question. Response: Our response to this feedback is shown in the text below. PubMed is an excellent interface when executing a simple scoping search, or when identifying a limited number of specific key references is sought. Meanwhile, MEDLINE via Ovid more appropriate when the reviewer seeks to perform a comprehensive, structured, and systematic review of the literature. The source of this information which has informed the revision has been cited (and can be found at this URL https://library-guides.ucl.ac.uk/pubmed/medline).and the amended text is located on pages 9 & 10 of the manuscript.

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2. Updating References: Could you please update the reference list to include the most recent literature up to the current date in the revision? This will ensure the review is as current as possible.	Thank you for this useful suggestion which will enhance our review. Response: Our response to your feedback is as follows; This review was expanded from the end date reported in the submitted manuscript up to 29/07/24, which was the date the peer-review feedback was received by us. This identified two eligible studies. One using the original search terms and one from the bibliography of a systematic review which was only published in 2024. In addition, a doctoral thesis was identified but not included in the review as it was ineligible but was included in the manuscript in order to highlight the potential limitations of this review in terms of its eligibility criteria. Details of the additional eligible studies are located in Table 2 on pages 18-19 of the manuscript, the ineligible doctoral thesis page 22. Citations for eligible and ineligible studies arising from this updated search are shown below. Eligible studies
	Agley et al., 2024 Digital intervention promoting physical activity in people newly diagnosed with Parkinson's disease: Feasibility and acceptability of knowledge, exercise-self-efficacy, and participation (KEEP) Intervention. Colón-Semenza et al., 2018 Peer coaching through mHealth targeting physical activity in people with Parkinson's disease: Feasibility study. Ineligible but relevant doctoral thesis Long K. Physical Activity Behaviour Change Program for People with Early Stage Parkinson's.: Columbia University; 2020.

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3. Title Simplification: The title could be streamlined to make it more straightforward and concise. One suggestion is "Digital Health Technologies and Self-Efficacy in Parkinson's: A Scoping Review." Additionally, in the abstract section, it would be beneficial to include a sentence in the background to emphasize the significance of self-efficacy in managing Parkinson's disease.	You raise a good point here to improve the manuscript. Response: We have changed the title to that which you suggest as it is more succinct and impactful. Located on Page 2 of the manuscript. Thank you for your insight on this aspect of the review, Response: In response we have written that; Prior research has identified that People with Parkinson's reporting lower levels of self-efficacy exhibit worsening motor and non-motor symptomology, reduced quality of life and selfmanagement located in the first sentence of the abstract located on page 3 of the manuscript. In addition, these determinants of self-efficacy have been developed in the background of this manuscript at the end of the second paragraph on page 7. The source related to this has been cited.
4. Discussion of Literature Gaps: Identification of potential gaps in the literature is very helpful.	Thank you for this postive and balanced feedback It is pleasing that you have found our inclusion of the potential gaps in the literature very helpful.

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However, a more detailed discussion of these gaps would be valuable. Could you please expand on this section to further facilitate research in this field?	We are grateful to receive your suggestion on how we can enhance this particular point in the manuscript. Response: In response we have introduced this in the conclusion of the abstract located on page 5 of the manuscript. Introduced in the conclusion of the abstract located on page 5 of the manuscript. We have discussed the types of gaps in the literature this scoping review has identified specifically mentioning that these are evidence and knowledge gaps are evidence and knowledge gaps and have cited research on the types of literature gaps. We have sign-posted readers to a published framework which can be used to evaluate gaps in literature reviews, and in doing so have facilitated future work in this field. This is located on the 4th paragraph on page 22 and extends into the top of page 23. In response to this feedback, we have thematically developed this important aspect of the review on pages 21, 22, and 24 which forms part of the discussion. A separate paragraph on gaps in the literature and future research has been written and can be located on page 24 paragraph 3 extending into page 25 of this manuscript.
5.The identification of potential gaps in the literature is very helpful. However, a more detailed discussion of these gaps would be valuable. Could you please expand on this section to further facilitate research in this field?	Thank you for this clear and helpful response. Response: The manuscript has been revised in the following ways. The types of gaps in the literature have been identified and characterised with examples of how this review has identified these gaps with examples to support them. A published framework for evaluating gaps in literature in systematic reviews is presented in order to facilitate the readers understanding of these gaps more broadly and in greater depth. These revisions are located in the last paragraph of page 21, and both paragraphs 1 and 2 on page 22 of this manuscript

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Reviewer 2

Comment	Response
1- In the abstract, presenting the database search methods is insufficient. Clearly state the technique adopted in the paper.	Thank you for this useful and considered feedback. Response: This feedback appears to partially conflicts with editorial feedback which sign-posts the authors to this example. https://bmjopen.bmj.com/content/12/2/e054120 To address both your feedback and the editorial feedback the following text has been incorporated into the manuscripts abstract. 'MEDLINE, Embase, PsychINFO, CINAHL, Web of Science, IEEE Xplore, and Google Scholar for grey literature were searched and reviewed using the six-step review reported by Arksey and O'Malley (2005)'.Located on page 4 of this manuscript.

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2—The authors clearly defined the selfefficacy concept following Bandura's protocol but did not do the same for DHT. The paper covered DHT superficially; I suggest a deeper definition and categorization of various digital technologies. (Page 13, line 55)	Thank you for this clear and useful feedback. Response: We have now included the following definition of DHT proposed by the FDA; 'Digital health technologies use computing platforms, connectivity software, and sensors for health care and related uses. These technologies span a wide range of span a wide range of uses, from applications in general wellness to applications as medical devices' (FDA 2020). This is located on pages7-8. These DHT are categorised as follows. Tier C DHTs for treating and diagnosis medical conditions or guiding care choices Tier B DHTs for helping citizens and patients to manage their own health and wellness Tier A DHTs intended to save costs or release staff time, no direct patient, health, or care outcomes (NICE, 2022). This can be located on Page 8 of the manuscript.
3 - Does the Effectiveness section (Page 14, line 31) stand for literature validation? If so, you should follow the PRISMA guidelines to validate the selected studies.	The subtitle has been changed to included studies rather than effectiveness. A detailed rationale for the information presented for each study in Table 2 and reasons why this review does not involve literature validation or effectiveness is provided. This can be located in the final paragraph on page 14.

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4—The discussion section must elaborate deeply. The actual description does not interpret and justify the results deeply.	Thank you for suggesting how the discussion can be discussed. Response In response to your feedback the discussion has been elaborated on more deeply. Findings from the review are scrutinised and their interpretation has been extended beyond simply describing them. These revisions are interspersed throughout the discussion section of the manuscript starting on page 21.

Reviewer 3

Your population was PwP (page 9), but you also included studies with the care partner of PwP in your inclusion criteria (page 10). I think you need more explanation about this for the readers.	Thank you for highlighting this discrepancy. This replicates the PICOS and inclusion criteria in the scoping review protocol we published in this journal. Deviating from the protocol would have been of concern had the protocol and the review been compared. The rationale for including care partners was that some studies might have People with Parkinson's and their care partners and that excluding these might exclude important studies. Given the important role care partners play in supporting People with Parkinson's the absence of studies which included care partners is potentially important. (Hall *et al.*, 2023). However, we do concede this discrepancy and an explanation for this is located in the
	inclusion criteria on page 12 of the manuscript.

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Numbers are not matched with the Figure 1 and page 12 line 60. And in the Figure 1, 27449 were identified and duplicates (1266) and articles marked ineligible by automation (25793) were removed then the number should be 390. Records identified from Databases (n=27449) vs A total of 27499 records were exported And in the Figure 1, 27449 were identified and duplicates (1266) and articles marked ineligible by automation (25793) were removed then the number should be 390. There is a need for more information to understand the record screened (n=97).	Thank you for bringing these discrepancies to our attention. Response These have been corrected. Response The PRISMA flowchart Figure 1 has been updated to incorporate the two extensions to the search, the original extension found in the first manuscript and a further extension at the request of one of the peer-reviewers. These changes can be located in Figure 1 and on page 14 of the manuscript in the first paragraph. Thank you for highlighting this discrepancy Response (n=27449) in Figure 1 has been retained as it is correct. A total of 27499 records were exported in the text has been changed to 27449 records were exported, located on page 13 of the manuscript. Thank you for this suggestion to enhance the manuscript. Response More information is provided in Figure 1 on page 13 of the manuscript. This describes how n=97 records was reached and the step in which n=97 records was reduced to n=33 records is written in the text of the manuscript located on
The Table 2 need to be organized. Especially the Intervention description and key findings column needs more editing and	Thank you for this constructive feedback. Response

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summarizing to increase readability. And please use correct punctuations in the table.	In response to the feedback provided we have sought to make the intervention descriptions clearer and more succinct. Intervention and outcome have been distance further to demarcate them more clearly. Finally, the punctuations in this table have been reviewed and addressed Table 2 and its revisions can be located across pages 17-19 of the manuscript.

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Page 18. In discussion, please elaborate on 'a sizable gap' mentioned in the discussion. Also, more details are required to follow your argument on informing other clinical specialties.	Thank you for identifying how ‘sizable gap’ needs to be better explained and elaborated upon. Response The manuscript has been revised in the following ways. The types of gaps in the literature have been identified and characterised with examples of how this review has identified these gaps with examples to support them. A published framework for evaluating gaps in literature in systematic reviews is presented in order to facilitate the readers understanding of these gaps more broadly and in greater depth. This is informed by the findings of this review. These revisions are located on the last paragraph of of page 21 and the first two paragraphs of page 22. In addition, this is briefly included in the conclusion of the abstract. This is a good point you raise here. Response The argument of informing other clinical specialities has been expanded and developed and also includes reciprocation. This can be located in the second paragraph on page 22 of this manuscript.
It appears that the discussion section needs overall enhancement focused on selfefficacy and usability/satisfaction-pros and cons using this intervention. Locate in manuscript.	This is expanded on in paragraph 2 of page 22 and 1 on page 23.Much more emphasis of this is also interspersed throughout the discussion in general now.

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Page 19 line 13, Please remove the period in the middle of the sentence. Thank you.	Thank you for identifying this unnecessary punctuation mark. This period in the middle of the sentence has been removed.

We have uploaded as requested the following documents:

- This cover letter
- Main Document - Clean
- Main Document – Tracked changes version
- PRISMA ScR checklist
- Revised PRISMA Flowchart
- Updated Supplement Full Extracted Dataset

VERSION 2 - REVIEW

Reviewer	**3**
Name	**Lee, JuHee**
Affiliation	**Yonsei University**
Date	**04-Nov-2024**
COI	

Thank you for the revision. The authors tried to report current evidence though followings are still limited.General approach using digital health technology in symptomatically or affective/physical domain should be elaborated more because self-efficacy is one of NMS other than symptoms. Thank you.

Results

- The results included both qualitative research and survey-based studies.

An additional description of the similarities and differences or pros/cons between the two groups of studies is required.

- Table 2 needs to be organized in a more visually accessible way.

Discussion

- A more thorough comparative review of self-efficacy about digital health technology and Parkinson's disease is needed.

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VERSION 2 - AUTHOR RESPONSE

Response letter upload below. File entitled Cover Letter BMJ Open Scoping review 011224.docx

Comment from Reviewer 1	Response and location in manuscript
General approach using digital health technology in symptomatically or affective/physical domain should be elaborated more because self-efficacy is one of NMS other than symptoms. Thank you.	Thank you for this helpful suggested which we have sought to address. In the discussion we highlight that the eligible studies predominantly focus on physical activities and falls, and by inference MS as the outcomes indicate these types of measures. and that self-efficacy is determined by MS and NMS. This is additionally described under themes in Table 2.
Results - The results included both qualitative research and survey-based studies. An additional description of the similarities and differences or pros/cons between the two groups of studies is required. - Table 2 needs to be organized in a more visually accessible way.	This feedback is really helpful for enhancing our manuscript, thank you. This is discussed in the paragraph between Table 2 and the discussion. It develops beyond Table 2 and leads into the discussion where this is further discussed. Table 2 has been reorganised to make it more accessible for the reader. The content is reduced, and reader is signposted to the supplements for the remaining extracted data. Modifications made to this Table are based on the feedback from reviewer 1 and stipulations from the journal regarding table size.
Discussion - A more thorough comparative review of self-efficacy about digital health technology and Parkinson's disease is needed.	Thank you for proposing a clear way to enhance our manuscript, which we have sought to address. The discussion has be revised to demonstrate a more comparative review of self-efficacy about digital technologies and Parkinson's.
If you have selected 'Yes' above, please provide details of any competing interests.: Not applicable	There are the competing interests which are disclosed in the manuscript written as. Competing interests: VA sits on the Statistical Advisory Board of the BMJ Open. AMH, CBC and EM have no competing interests to declare.

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We have uploaded as requested the following documents:

- This cover letter
- Main Document - Clean
- Main Document – Tracked changes version
- PRISMA ScR checklist
- Revised PRISMA Flowchart
- Supplement 1
- Supplement 2
- Supplement 3

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