



STUDY PROTOCOL

Can behavioural change interventions improve self-efficacy and exercise adherence among people with Parkinson's? A systematic review protocol [version 1; peer review: 1 approved, 1 approved with reservations]

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Abstract

Context: People with Parkinson's (PwP) have a higher tendency to engage in sedentary lifestyle behaviours and have lower physical activity levels compared to their healthy peers. Previous research has indicated that personal factors including poor outcome expectation and low self-efficacy are stronger predictors of exercise adherence than disease severity. **Objectives:** The purpose of this review is to synthesize the best available evidence on interventions that encompass self-management strategies to overcome barriers to exercise and improve self-efficacy and exercise adherence among PwP. **Methods:** The following databases will be searched using a comprehensive search strategy: EBSCO, Medline, Cinhal, Web of Science, PubMed, Embase, Scopus, Google Scholar and Cochrane Library from database inception to 2020. The title, abstract and full-text screening will be conducted by two independent reviewers. The Joanne Briggs Institute Checklist will be used to assess the quality of each included study. The quality of evidence will be reviewed using the GRADE criteria. Data will be extracted by two independent reviewers. The outcomes of interest will be self-efficacy outcomes and measures of exercise adherence. A systematic narrative synthesis will be conducted using a framework analysis, applying the Theoretical Domains Framework and Behaviour Change Wheel, producing findings focusing on practice-orientated outcomes. Presentation of data will include tables and text summarizing the characteristics and findings of the eligible studies. **Discussion:** The review will synthesize the best available evidence on interventions to enhance self-efficacy, improve quality of life, physical function, and ultimately improve

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Approval Status  

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Any reports and responses or comments on the article can be found at the end of the article.		

exercise adherence among PwP and provide invaluable information for healthcare professionals. The findings of this review will be disseminated through publication in a peer-reviewed journal and presented at relevant conference proceedings. This review will make recommendations for appropriate self-management strategies for maximum effect and may have implications for policy and practice regarding enhancing self-efficacy and long-term exercise adherence among PwP.

Keywords

Parkinson's, exercise self-efficacy, behavioural change interventions, quality of life, exercise adherence

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Introduction

Parkinson's is the second most common neurological condition globally. This neurodegenerative condition affects the basal ganglia, leading to progressive movement disorders which with time become more disabling¹. Key motor features associated with Parkinson's are tremor, rigidity (muscle stiffness), akinesia (difficulty initiating movement), bradykinesia (slow movements) and postural instability². There are also many non-motor features associated with Parkinson's including apathy, depression, pain, fatigue, sleep disorders, cognitive impairment, and autonomic dysfunction³. The combination of these motor and non-motor features can result in reduced mobility, reduction in quality of life and loss of function⁴. As a result, people with Parkinson's (PwP) have a higher tendency to adopt sedentary lifestyle behaviours and have lower levels of physical activity compared to their healthy peers^{4,5}.

Exercise and Parkinson's

The role of exercise in the management of Parkinson's is well-documented. Majority of exercise interventions for PwP focus on resistance training, balance, aerobic exercise, and flexibility conducted in an exercise or rehabilitative setting⁶. A meta-analysis conducted by Choi *et al.*⁷ investigated the effects of exercise therapies on PwP. Exercise therapies including walking⁸⁻¹⁰, strength and flexibility¹¹⁻¹⁴, balance^{15,16}, aerobic¹⁷⁻²⁰ and combined exercise²¹⁻²⁵ were shown to improve balance, walking speed, exercise tolerance, gait function, aerobic capacity, motor control, physical functioning, muscular strength and flexibility among PwP⁷. However, exercise therapies did not show a statistically significant effect on the non-motor symptoms. They concluded that exercise therapy is more effective for the motor symptoms rather than the non-motor symptoms of PwP⁷.

However, Tennigkeit *et al.*²⁶ conducted a systematic review including 24 studies which discussed the benefits of exercise and self-management education for PwP from Sweden and Germany. Self-management education interventions included interactive group sessions, education sessions for PwP and family members, educational video clips, role playing and handouts and self-monitoring techniques (using diaries for fluctuation in symptoms). They reported positive outcomes for health-related and general quality of life (QoL)²⁷⁻³⁷, depression^{27,28,30,32-36,38,39}, self-efficacy^{27,32,38,40}, and functional mobility^{30,40,41}, suggesting the benefit of behavioural change interventions for improving the non-motor symptoms of PwP.

Despite the clear benefits of exercise for PwP, only 30% achieve recommended activity levels, some are inactive for 70% of the day and most are less active than their age-matched peers⁴². Recently, studies have shown that exercise may have protective effects associated with the basal ganglia (known as neurogenesis) which results in improvement in dopamine transmission, increased cerebral blood flow and new formation of neuronal synapses which in turn can improve motor function⁴³. Neurogenesis can result in a slowed progression of Parkinson's and improvements in motor control, particularly when exercise is carried out at vigorous intensities⁴³⁻⁴⁵.

In addition to this, a study conducted by Sajatovic *et al.*³⁸ investigated the changes in depression in PwP (with depression) between a combined group exercise and self-management

program and a self-directed individual exercise and self-management program. They reported no significant changes in apathy or anxiety in both groups. However, both groups displayed modest improvement in cognition, while the combined group showed additional significant improvements in depression³⁸. This indicates that behavioural self-management strategies such as group education and peer support may improve non-motor features such as depression in PwP.

Barriers to exercise in PwP

While good compliance can be achieved with prescribed exercise programmes with supervision within a clinical trial this does not completely translate to similar compliance during everyday life. Schootemeijer *et al.*⁴⁶ conducted a comprehensive review discussing the various barriers to exercise faced by PwP. They discussed barriers including non-motor factors (anxiety, depression, fatigue, and apathy), personal factors (low self-efficacy, fear of falling, low outcome expectation and lack of time) and environmental factors (lack of social support, lack of exercise partner, poor accessibility, bad weather, financial burden, cultural challenges, awareness of moving in a crowded environment, and discomfort of seeing advancing symptoms of peers)⁴⁶.

Although PwP experience increasing difficulties engaging in exercise as the disease progresses, previous research has indicated that personal factors including poor outcome expectation and low self-efficacy are stronger predictors of exercise adherence than disease severity⁴⁷.

In terms of exercise, self-efficacy is an individual's confidence or belief that they can successfully engage in physical activity or exercise^{48,49}. Exercise self-efficacy can be categorized into performance self-efficacy (beliefs about performing exercises) or beliefs in overcoming barriers^{50,51}. Exercise self-efficacy determines the type of exercise an individual partakes in, their effort level, and their long-term exercise adherence when they face barriers to participation^{50,52}. A meta-analysis conducted by Higgins *et al.*⁵¹ reported that short-term exercise interventions (duration between two - eight weeks) were more effective for enhancing performance efficacy. While interventions that included long-term strategies which provided opportunities for individuals to experience and successfully conquer barriers over a longer period were more effective for enhancing confidence in overcoming barriers to exercise⁵¹.

Behavioural change

Adapting health behaviour in terms of changing from a sedentary lifestyle to a more physically active lifestyle is a complex process⁵³. Merely informing individuals about the benefits of physical activity has been shown as inadequate to maintaining behavioural change^{53,54}. In order to assist behavioural change in PwP disease-specific counselling and coaching may be required⁵⁵. Behavioural change interventions are complex and involved many cooperating components⁵⁶. These psychology-focused interventions try to facilitate more constructive health behaviours⁵⁷. Particular strategies are utilized to promote behaviour change; some interventions are tailored to enhancing physical activity engagement by identifying barriers and problem solving⁵⁸. While others prompt individuals to track their sedentary behaviour as a method of changing behaviour⁵⁸. These

interventions utilize theories of behaviour and behaviour change to inform particular therapeutic strategies⁵⁹.

Speelman *et al.*⁶⁰ studied the long-term effect of including behavioural change interventions (coaching, goal setting, use of activity monitors) into a multi-facet exercise program for PwP. They reported improvements in physical activity level for all subgroups of PwP⁶⁰. While Ellis *et al.*⁶¹ investigated the effects of short daily interactions (five minutes/day) with a virtual exercise coach to encourage walking (monitored by a pedometer) among PwP. The interactions discussed progression of short- and long-term goals, collaborative problem solving to overcome barriers and positive support⁶¹. They reported excellent retention rate in the walking program and improvements in gait after one month. However, due to the short duration of the intervention the long-term effects of adherence and occurrence of behaviour change are unknown⁶¹.

In order to motivate individuals with Parkinson’s to remain physically active outside a clinical setting it is important to identify self-management strategies to overcome these barriers, improve self-efficacy and promote physical activity among PwP. To the best of our knowledge this is the only review exploring the effectiveness of behaviour change interventions on self-efficacy and long-term exercise adherence among PwP. The findings of this review will make recommendations for appropriate self-management strategies and may have implications for policy and practice.

Review objectives

The purpose of this review is to synthesize the best available evidence on behaviour change interventions that encompass self-management strategies to over barriers to exercise and improve exercise adherence among PwP.

Specifically, the objectives are to:

- Examine self-management strategies to overcome barriers to exercise among PwP.
- Determine the effectiveness of behavioural change interventions aimed to improve exercise self-efficacy, QoL and physical function among PwP.
- Identify strategies to promote long-term exercise adherence among PwP.

Research question

Specially, this review is aimed to answer the following questions:

1. Do behavioural change interventions improve exercise self-efficacy among PwP?
2. Do behavioural change interventions improve QoL and/or physical function among PwP?
3. Do behavioural change interventions improve exercise adherence/increase levels of physical activity among PwP?

Methods

This protocol was designed in line with the methodological framework provided by the Joanna Briggs Institute (JBI)

Reviewer’s Manual⁶² and the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines⁶³. This review is registered with PROSPERO (ID: 293057; currently awaiting confirmation). *Extended Data:* PRIMSA-P Checklist

Inclusion and exclusion criteria

Studies to be include in this review must satisfy the following inclusion criteria

Study Characteristics	Inclusion Criteria	Exclusion Criteria
(i) Population, or participants and conditions of interest	<ul style="list-style-type: none"> • Community dwelling independently mobile people with Parkinson’s. • No limitations will be placed on the length of time since diagnosis or age. • Studies including people with Parkinson’s diagnosed with other comorbidities (e.g anxiety, depression, and diabetes) can be included. However, outcomes must focus on exercise self-efficacy and/or exercise uptake/ adherence and not changes in the comorbidity. • Population will not be restricted to Ireland or the UK, articles from all countries will be examined. 	<p>If recruited participants:</p> <ol style="list-style-type: none"> a) Do not have a diagnosis of Parkinson’s, or have a diagnosis of Atypical Parkinson’s b) Are immobile or wheelchair-bound, c) Involve severe visual or auditory impairment, serious medical conditions in major organs (heart, lung, or kidney) or other illnesses which prevent independent ambulation. d) Involve people with Parkinson’s who are identified as a high falls risk (fallers)
(ii) Intervention	<ul style="list-style-type: none"> • Any form of behavioural change intervention (e.g education, behavioural technology, or support groups) or support strategy to improve QoL, exercise self-efficacy or exercise uptake. <p>For the purpose of this review <i>behavioural change intervention</i> will be defined as any psychology-focused intervention (used in conjunction with exercise or alone)⁵⁷. While <i>exercise self-efficacy</i> is defined as an individual’s confidence or belief that they can successfully engage in physical activity or exercise^{48,49}</p>	<ul style="list-style-type: none"> • The intervention does not include self-efficacy strategies or behavioural change interventions. • The intervention focuses solely on falls prevention

Study Characteristics	Inclusion Criteria	Exclusion Criteria
(iii) Outcomes of interest	<ul style="list-style-type: none"> Outcomes reported at every time-points will be considered for this review. Primary outcomes are self-efficacy measures (e.g Self-efficacy for exercise scale, Physical Activity Assessment Inventory), QoL (e.g PDQ-39, PDQ-8), physical function (e.g 6MWT, gait velocity), and measures of exercise adherence (e.g self-log, activity monitors). 	Outcomes reported are not related to exercise adherence/uptake (i.e medication adherence, changes in anxiety and depression)
(iv) Setting	Studies conducting interventions in the following settings will be included; community gyms/halls, community outpatient facilities, home environment or in any geographical setting globally.	Acute hospitals, Long-term care facilities.
(v) Study design	Interventional studies: RCTs, quasi-experimental trials, pilot interventional studies, pre- and post-interventional studies, and feasibility studies.	Qualitative studies, observational studies, or systematic reviews
		Other: <ul style="list-style-type: none"> Full-text articles are not available. Papers are not published in English
(vi) Phenomenon of interest	The review will include studies that explore behavioural change strategies to enhance exercise self-efficacy, improve QoL, physical function and ultimately improve adherence to exercise among community dwelling individuals with Parkinson's, including but not limited to behavioural interventions (motivational interviewing, goal setting and cognitive re-framing) and support strategies (peer and family education and support sessions).	

Search strategy. Two independent reviewers (LA and RMcC) will conduct a search using the following electronic databases: *EBSCO, Medline, Cinhal, Web of science, PubMed, Embase, Scopus, Google Scholar, Cochrane Library*. Databases will be searched from inception to 2020. The search strategy was developed by the primary author (LA) and supported by a librarian with systematic review experience (VC). Two independent reviewers (LA and RMcC) will search the databases using the

search terms showed in [Table 1](#). Reference lists of related articles and relevant reviews will be checked to identify further eligible studies.

Study records. Articles identified from the literature search will be uploaded to Endnote X8, a citation manager. Duplicates will be removed using the “remove duplicates” function, and manual screening of the results will be conducted to ensure accuracy (LA). Titles and abstracts of the identified articles will then be exported to Rayyan (LA), an electronic software designed to support article screening and allows collaboration between reviewers during the study selection process.

Study selection. Two independent reviewers (LA and RMcC) will be involved in the study selection process through each phase of the review. Following the removal of duplicates, LA and RMcC will independently screen all titles and abstracts of the articles identified by the literature search. Studies not meeting the inclusion criteria will be excluded. Prior to the formal screening process, test screening questions will be developed based on the inclusion/exclusion criteria.

Subsequently, LA and RMcC will independently screen the full text articles identified from the previous stage to select the suitable studies. Reference lists of the included articles and previously conducted reviews in the area will be checked to identify any additional studies. Both LA and RMcC will independently screen any additional articles to determine their suitability. Any disagreement regarding inclusion will be resolved by a third reviewer (ST). A Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) flow diagram will display the study selection process and summarise the inclusion and exclusion of studies at each stage of the review by providing reason for exclusion.

Data collection and extraction

Two independent reviewers (LA and RMcC) will extract data from each eligible study and conduct the risk of bias assessment. Reviewers will perform practice extraction exercises prior to the formal extraction to ensure consistency. Any disagreement regarding extraction will be resolved by a third reviewer (ST) and a consensus achieved. If required, primary authors of studies will be contacted to provide further details. Data extracted will include study design, sample characteristics (size, gender, mean age) specific details about the intervention (type, duration and follow-up) and implementation methods, pre- and post-intervention outcome results, and theoretical framework used (if applicable).

Methodological quality of studies

To assess the potential risk of bias The Joanne Briggs Institute Checklist⁶² for the corresponding study designs will be used for each eligible study.

Two independent reviewers (LA and RMcC) will assess the potential risk of bias of each article. Any disagreements will be resolved by a third reviewer (ST). In the incidence where

Table 1. Search strategy.

Databases:
- EBSCO (Academic search complete and Psycinfo)
- Medline
- Cinahl
- Web of Science
- PubMed
- Embase
- Scopus
- Google Scholar
- Cochrane Library
Search keywords:
1. ["behavioural change intervention*" OR "behavioral change intervention*" OR "behaviour change technique*" OR "behavior change technique*" OR "cognitive behavioural therapy" OR "cognitive behavioral therapy" OR psychology OR "psychological therapy" OR "health behaviour*" OR "health behavior*"]
2. [self-efficacy OR "self efficacy" OR "physical activity self-efficacy" OR "physical activity self efficacy" OR "exercise self-efficacy" OR "exercise self efficacy" OR self-management]
3. 1 AND 2
4. ["physical activit*" OR recreation OR sport OR exercise OR training OR fitness OR "physical therap*" OR rehabilitation]
5. 3 AND 4
6. ["Parkinson's Disease" OR "Parkinsons Disease" OR "Parkinson Disease" OR Parkinson's OR Parkinson]
7. 5 AND 6

data is missing, or information is not clear the primary authors will be contacted for clarification. Following the assessment, studies will be classified as a high, medium, low, or unclear risk of bias.

Assessing the quality of evidence

The quality of evidence will be assessed using the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) approach⁶⁴. This involves assessing the quality of evidence using a specific points system to upgrade or downgrade the ratings for each quality characteristic. Evidence can be downgraded one level for serious limitations or two levels for very serious limitations depending on the assessment for five characteristics: limitation in study design and conduct, inconsistent results across studies, indirectness of evidence with respect to study design, populations, interventions, comparisons or outcomes, imprecision of the estimates of the effect and publication bias. Evidence can be upgraded depending on the assessment of the following three characteristics; large magnitude of effect, plausible confounding that would reduce the effect, and dose-response gradient⁶⁵⁻⁶⁸.

Two independent reviewers will assess the quality of each eligible articles (LA and RMcC). Any disagreement will be resolved by a third reviewer (ST) and a consensus achieved. In the

incidence where information is not clear the primary authors will be contacted for clarification.

Data synthesis and analysis

A narrative synthesis will be conducted. Data presentation will include tables and text summarizing the characteristics and findings of the eligible studies. The qualitative synthesis will investigate the association and findings between and within the eligible studies.

Data analysis will be conducted using a framework analysis, applying the Theoretical Domains Framework (TDF) and Behaviour Change Wheel (BCW), producing findings focusing on practice-orientated outcomes. The TDF includes fourteen domains related to the psychology of behaviour change⁶⁹. While the BCW focuses on the success of implementing interventions by coordinating change interventions with behavioural barriers; a person's opportunity, capability and motivation interconnects and influence their behaviour (COM-B)⁷⁰.

One researcher (LA) will develop initial codes and themes, which will be verified by another researchers (RMcC). All coding will be conducted iteratively by two members of the research team (LA and RMcC). Two researchers (LA and RMcC) will than assign codes and themes to the TDF and

BWC domains. Themes will then be reviewed again by all three researchers (LA, and RMCC) to confirm final coding and theme allocation.

Dissemination of results

The systematic review will be disseminated in a peer-reviewed journal. The dataset created during the study will be available from the corresponding author upon request.

Amendments

Any amendments to this protocol will be described in a table including the date of each amendment as well as a description of and rationale for this. The PROSPERO register will remain updated with the protocol and any amendments made.

Ethics approval and consent to participate

Ethical approval is not required for this study as it will not involve conducting experimental research or include identifying personal data.

Study status

The systematic review protocol was finalised in November 2021 and the database search was conducted in December 2021. Full-text screening will be completed in January 2022. It is anticipated the review will be completed in April 2022.

Discussion

Self-efficacy and attitudes towards exercise are linked in a linear relationship^{52,71}. Exercise self-efficacy increases with mastery experiences, as individual become more experienced with exercise. However, self-efficacy also plays an important role in maintaining motivation to exercise⁴⁹. While the body of evidence supporting behavioural change interventions displays a positive effect of self-efficacy there is a need to pool evidence from trials to accurately determine the treatment effect of these different interventions.

This will be the first review of behavioural change interventions implemented to enhance self-efficacy and improve exercise adherence among PwP. By exploring this, the findings of this review will provide invaluable information for healthcare professionals. Additionally, this review will make recommendations for appropriate self-management strategies for maximum effect and may have implications for future policy and practice regarding enhancing self-efficacy and long-term exercise adherence among PwP.

Data availability

No data are associated with this article.

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Open Peer Review

Current Peer Review Status: ? ✓

Version 1

Reviewer Report 25 April 2022

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Ailish Malone 

RCSI University of Medicine and Health Sciences, Dublin, Ireland

Thank you for the invitation to review this systematic review protocol. The protocol addresses an important gap in current evidence synthesis and proposes robust methods to achieve its aims.

The Introduction clearly conveys the state of the evidence in favour of the myriad benefits of exercise in Parkinson's, and the problem of inactivity. The review refers almost exclusively to "exercise" but the interventions might have an effect on habitual physical activity, too. Does the review intend to focus exclusively on *exercise* (structured, planned, repetitive, intentional), as distinct from *physical activity* (also including unstructured / incidental movement)? (I see that "physical activity" is a search term but the rest of the review refers to "exercise".)

The last paragraph under the subheading "Exercise in Parkinson's" presents the Sajatovic study, which compared a **group**-based exercise and self-management program with an **individual** exercise and self-management program. Participants in the **group** program showed additional improvements in depression scores, but were these differences seen within-group or between-group? Is the key difference, then, the mode of delivery (group v individual) rather than the components of the intervention and if so, what bearing might this have on the review?

Section "Barriers to exercise in PwP" – this section clearly communicates the problems with the translation of evidence for exercise into the real-world setting. The last paragraph could include a summary sentence. What are the implications for the review from the outcomes of short-term and long-term strategies?

Methods

The methods are mostly clear and follow the expected process for a systematic review. Some clarifications:

- Inclusion and exclusion criteria

For (i) Population, exclusion criterion b: please amend "wheelchair-bound" to "wheelchair user" ("wheelchair user" is the preferred, more inclusive term)

(iv) Setting: The study excludes acute hospitals. I see the rationale for this for current hospital inpatients or people who had a recent admission. However, would this exclusion apply if an outpatient intervention for community-dwelling people with Parkinson's happened to be delivered at an acute hospital? The service arrangements for delivery of outpatient care to people with Parkinson's might vary among health services and interventions meeting criteria (ii) could occur at an acute, specialist neurological hospital. If a study's population, intervention, and outcome(s) meet the inclusion criteria, should it not be included, irrespective of where it took place?

- Data extraction – do the authors have a plan for identifying and handling duplicate data (for example, where the same trial produced multiple papers with secondary analyses?)

The final article needs a thorough proofread as several minor errors remain in this version.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 16 Jul 2022

Leanne Ahern, University College Cork, Cork, Ireland

Thank you so much for taking the time to review our manuscript, and for your constructive comments. Responses and subsequent changes to the manuscript are detailed below.

Comment: The Introduction clearly conveys the state of the evidence in favour of the myriad benefits of exercise in Parkinson's and the problem of inactivity. The review refers almost exclusively to "exercise" but the interventions might have an effect on habitual physical activity, too. Does the review intend to focus exclusively on exercise (structured, planned, repetitive, intentional), as distinct from physical activity (also including unstructured/incidental movement)? (I see that "physical activity" is a search term but the rest of the review refers to "exercise".)

Response: Thank you for this comment, with was a factor in which we overlooked

Action: Paragraph added to the introduction regarding physical activity. This review intends to focus on both exercise and physical activity

Comment: The last paragraph under the subheading “Exercise in Parkinson’s” presents the Sajatovic study, which compared a group-based exercise and self-management program with an individual exercise and self-management program. Participants in the group program showed additional improvements in depression scores, but were these differences seen within-group or between-group? Is the key difference, then, the mode of delivery (group v individual) rather than the components of the intervention and if so, what bearing might this have on the review?

Response: Thank you for this comment as it is important that the information is clear for the readers. Upon further review of the paper, the differences that were reported in this review were within-group, therefore, highlighting that the differences are not solely related to mode of delivery.

Action: Rephrasing and more information provided to ensure clear message is conveyed regarding the results of this study

Comment: Section “Barriers to exercise in PwP” – this section clearly communicates the problems with the translation of evidence for exercise into the real-world setting. The last paragraph could include a summary sentence. What are the implications for the review from the outcomes of short-term and long-term strategies?

Response: Thank you for this comment

Action: Included summary sentence at end of paragraph

Comment: The methods are mostly clear and follow the expected process for a systematic review. Some clarifications:
Inclusion and exclusion criteria

For (i) Population, exclusion criterion b: please amend “wheelchair-bound” to “wheelchair user” (“wheelchair user” is the preferred, more inclusive term)

(iv) Setting: The study excludes acute hospitals. I see the rationale for this for current hospital inpatients or people who had a recent admission. However, would this exclusion apply if an outpatient intervention for community-dwelling people with Parkinson’s happened to be delivered at an acute hospital? The service arrangements for delivery of outpatient care to people with Parkinson’s might vary among health services and interventions meeting criteria (ii) could occur at an acute, specialist neurological hospital. If a study’s population, intervention, and outcome(s) meet the inclusion criteria, should it not be included, irrespective of where it took place?

Response: Thank you for this comment, we agree that clarification is needed.

Action: The suggestions have been considered and amendments have been made regarding the inclusion criteria for the population and the setting.

Competing Interests: None

Reviewer Report 11 March 2022

<https://doi.org/10.21956/hrbopenres.14686.r31537>

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Katherine Baker

Department of Sport, Exercise and Rehabilitation, Northumbria University, Newcastle upon Tyne, UK

Thank you for the opportunity to review this manuscript. The proposed review will make an important contribution to the evidence base.

Abstract: Provides a useful summary and rationale for the review. Methods could include study designs that will be included.

Introduction: includes relevant and contemporary work in the area. This section clearly outlines the need to better understand ways of influencing behaviour change. As the Theoretical Domains Framework and Behaviour Change Wheel are proposed as the theoretical frameworks for the review, it would be appropriate to acknowledge them here.

Review objectives: exercise adherence is not identified as an outcome in the second objective, consider including this given the third objective which talks about the strategies but not adherence as an outcome.

Methodology: it is interesting that you propose a qualitative synthesis when the review inclusion criteria allows only quantitative study designs. Further explanation is needed on how this will be done.

There are typographical mistakes throughout, please review carefully.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Partly

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Physiotherapy, Parkinson's, physical activity and exercise

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 16 Jul 2022

Leanne Ahern, University College Cork, Cork, Ireland

Thank you so much for taking the time to review our manuscript, and for your constructive comments. Responses and subsequent changes to the manuscript are detailed below.

Comment: Abstract: Provides a useful summary and rationale for the review. Methods could include study designs that will be included.

Response: We agree with this comment and believe it would provide important information to the readers

Action: Sentence "Interventional studies including behavioural change interventions will be included in this review" was included in the abstract

Comment: Introduction: includes relevant and contemporary work in the area. This section clearly outlines the need to better understand ways of influencing behaviour change. As the Theoretical Domains Framework and Behaviour Change Wheel are proposed as the theoretical frameworks for the review, it would be appropriate to acknowledge them here.

Response: We agree with this comment and admit it was an element which we overlooked. Thank you for this comment.

Action: Paragraphs regarding the Theoretical Domains Framework and Behaviour Change Wheel have been included in the introduction

Comment: Review objectives: exercise adherence is not identified as an outcome in the second objective, consider including this in the third objective which talks about the strategies but not adherence as an outcome.

Response: We agree with this comment as exercise adherence is referred to many times in the article.

Action: Exercise adherence included as an outcome in the second objective

Comment: Methodology: it is interesting that you propose a qualitative synthesis when the review inclusion criteria allows only quantitative study designs. Further explanation is needed on how this will be done.

Response: Thank you for this comment, we were not aware of the lack of transparency with regards to this.

Action: Methods section has been amended to a narrative synthesis with the addition of assessment for eligibility for meta-analysis

Competing Interests: No competing interests were disclosed.
