PEER REVIEW HISTORY

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ARTICLE DETAILS

<table>
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<th>TITLE (PROVISIONAL)</th>
<th>Efficacy of interventions to improve physical activity levels in individuals with stroke: a systematic review protocol</th>
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<td>AUTHORS</td>
<td>Faria, Christina; Aguiar, Larissa; Martins, Júlia; Nadeau, Sylvie; Britto, Raquel; Teixeira-Salmela, Luci</td>
</tr>
</tbody>
</table>

VERSION 1 - REVIEW

| REVIEWER            | Taryn Jones Macquarie University, Australia |
| REVIEW RETURNED     | 13-May-2016 |

GENERAL COMMENTS

Thank you for allowing me to review this important paper. With a growing global burden of stroke it is important that we update our current knowledge and examine the gaps in the literature in regards to physical activity interventions for those post-stroke. However, I do feel there are a number of amendments to this paper which need to occur prior to publication, and prior to the systematic review being conducted. I hope the authors find these recommendations helpful. There are a number of current references missing from this paper, and some greater specificity required in some aspects of the methods section.

Strengths of the paper: This paper focuses on a major issue in regards to global burden of disease, and offers an opportunity to more closely examine the current state of play in regards to physical activity interventions after stroke. The review plans to utilize the major databases and examine the risk of bias, and report according to current guidelines.

Recommendations:

Abstract: There are some grammatical errors which need to be considered, both in the abstract and throughout the paper itself. I have provided a number of recommendations for the paper, which will impact the abstract and require revision to the abstract for future review.

2. Introduction:
Overall, the introduction needs to be more thorough in its examination of the current literature and needs to be re-structured to more clearly lead the readers through to the aim of the review. I have made some specific recommendations to help guide this process.

2.1 Line 5: Need to change the statement "Stroke is the leading health problem worldwide..." to "Stroke is a leading problem worldwide..." as stating it is THE leading problem is incorrect.
2.2 Line 12: Consider including the point that the majority of the growth of the global stroke burden is coming from developing countries.

2.3 Line 16: Need to improve the final sentence in first paragraph - there is no discussion about the impact of stroke and the link to secondary conditions that makes a clear link built to the need for interventions. It needs an additional sentence prior to this last sentence that makes a better link to this statement.

2.4 Paragraph 2 - consider using the ICF framework to better structure this paragraph - impairments, leading to reductions in physical activity and participation...and structure the cycle around this. Not all of the examples that you have provided are "disabilities" - eg reduced social participation is not a "disability" so this wording is not correct. Also, a useful paper here would be Jones TM, Dean CM, Dear BF, Hush JM, Titov N (2015) An internet survey of the characteristics and physical activity of community-dwelling Australian adults with acquired brain injury: exploring interest in an internet delivered self-management program focused on physical activity. Disability and Health Journal; DOI: 10.1016/j.dhjo.2015.08.004 which discusses the biggest barriers to physical activity being pain, fatigue and fear.

2.5: Consider switching the order of paragraphs 2 & 3 - therefore discussing the low levels of activity first, then what causes them, which leads better into discussion regarding intervention.

2.6: The word 'functionality' is a poor choice - consider replacing this with either function, or be clearer in your definition of what functionality actually is.

2.7: Need to be clearer in the reasons why this review needs to be done - what do we or don't we know yet in this space? This is important as there are other reviews in this space such as a Cochrane review by Morris et al (2014). There is currently no summary of what is known or not known in this space that clearly leads to the reason for this review to be done. The authors need to more clearly outline the current state of play.

3. Methods:
3.1: Types of studies - consider what you will do with studies that used a quasi-randomised strategy, eg date of birth?

3.2: Participants - Consider studies that included mixed groups - eg chronic health conditions. You may need to specify that authors will be contacted for specific data relating to those with stroke, or that a certain proportion of the group needs to be stroke etc...or make ineligible unless all stroke?? Also, will you include TIA and/or those with mild stroke that make a full recovery?

3.3: Types of interventions - what about interventions that include things such as counselling, self-management, behavioural interventions etc? You may also need to specify whether you are restricting or not based on mode of delivery - eg face-to-face, groups, remote delivery etc

3.4: The term 'physical activity needs to be defined earlier in the paper - perhaps in the intro, or earlier in the methods section.
3.5: Search strategy - will papers that are not in English, Spanish or Portuguese be included or not?

3.6: Line 25 - should state "...hand searches" not search

3.7: Risk of bias assessment - how will this be reported? Although PEDro does give an overall score - this is not an ideal way to present risk of bias but rather it is better to present each papers check on the individual items in order to provide greater transparency. This prevents a study seeming to have a high score, but yet failing substantially on one item that can cause a high risk of bias.

3.8: More detail is required as to how the qualitative synthesis will be done.

3.9: RevMan software should be referenced

4. Discussion:
4.1 The statement that this is the first systematic review is incorrect - a Cochrane review by Morris et al (2014) examined the effect of interventions on long-term participation in physical activity after stroke. Myself and others did a SR in 2015 examining the efficacy of self-management interventions on increasing physical activity after ABI, which was predominantly stroke and some TBI (Jones TM et al, 2015, Systematic Reviews).

4.2 The discussion needs to build more on what this review can add, that hasn't already been added by prior reviews in this space.

REVIEWER
Karen Borschmann
The Florey Institute, Australia

REVIEW RETURNED
07-Jun-2016

GENERAL COMMENTS
Thank you for your plans to undertake a systematic review and meta-analysis of methods to increase physical activity after stroke. This is an important gap in evidence. There are a few points that I think will enhance your manuscript:

1. Stroke is not THE (number 1) leading health problem. Please change the first sentence to "Stroke is a leading health problem..."

2. Page 5: third chapter. Although physical activity is low after stroke compared to population-based studies, this only suggests (it does not prove) that physical activity is reduced after stroke. Without knowing how active people are before their stroke, we cannot say that stroke caused them to become inactive. Please change or remove the last sentence in this chapter.

3. Page 7: outcome measures. Sedentary time, separate to physical activity, appears to be important for health outcomes. Please state whether sedentary time would be included as an outcome measure.

4. Page 7: outcome measures. You state that exercise capacity will not be included as an outcome measure, however, search terms 28 - 32 on page 19 include physical fitness measures. Please revise this section, or explain why physical fitness is included in the search.
5. Page 10. Which trail register will be screened to assess whether selective reporting is present?

**VERSION 1 – AUTHOR RESPONSE**

Reviewer: 1  
Reviewer Name: Taryn Jones  
Institution and Country: Macquarie University, Australia  
Please state any competing interests or state 'None declared': None declared  
Please leave your comments for the authors below:

Thank you for allowing me to review this important paper. With a growing global burden of stroke it is important that we update our current knowledge and examine the gaps in the literature in regards to physical activity interventions for those post-stroke. However, I do feel there are a number of amendments to this paper which need to occur prior to publication, and prior to the systematic review being conducted. I hope the authors find these recommendations helpful. There are a number of current references missing from this paper, and some greater specificity required in some aspects of the methods section.

Strengths of the paper: This paper focuses on a major issue in regards to global burden of disease, and offers an opportunity to more closely examine the current state of play in regards to physical activity interventions after stroke. The review plans to utilize the major databases and examine the risk of bias, and report according to current guidelines.

First, we would like to thank the reviewer for all of the relevant comments and we are glad to hear that this manuscript was considered as an important paper.

Recommendations

Abstract: There are some grammatical errors which need to be considered, both in the abstract and throughout the paper itself. I have provided a number of recommendations for the paper, which will impact the abstract and require revision to the abstract for future review.

Modifications were carried-out in the abstract, to match those included in the main text. Page 3:

**ABSTRACT**

Introduction: Stroke is a leading health problem worldwide and an important cause of disability. Stroke subjects show low levels of physical activity and increases in physical activity levels may improve function and health status. Therefore, the aims are to identify which interventions that have been employed to increase physical activity levels with stroke subjects, to verify their efficacy and identify the gaps in the literature.

Methods and analysis: A systematic review of randomized controlled trials that investigated the efficacy of interventions aiming at increasing physical activity levels of stroke subjects will be conducted. Electronic searches will be performed in the MEDLINE, Physiotherapy Evidence Database (PEDro), Excerpta Medica (EMBASE), Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), and Scientific Electronic Library Online (SCIELO) databases. Hand searches of the reference lists of the included studies or relevant reviews will also be employed. Two independent reviewers will screen all the retrieved titles, abstracts, and full texts. A third reviewer will be referred to solve any disagreements. The quality of the included studies will be assessed by the PEDro Rating Scale. This systematic review will also include a qualitative synthesis. Meta-analyses will be performed, if the studies are sufficiently homogeneous. This review will follow the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement. The quality of the evidence regarding physical activity will be assessed, according to the Grading of Recommendations...
Assessment, Development, and Evaluation (GRADE).
Discussion: This systematic review will provide information on which interventions are effective for increasing physical activity levels of stroke subjects. This evidence may be important for clinical decision-making and will allow the identification of gaps in the literature that may be useful for the definition of future research goals and the planning of new trials.

2. Introduction:
Overall, the introduction needs to be more thorough in its examination of the current literature and needs to be re-structured to more clearly lead the readers through to the aim of the review. I have made some specific recommendations to help guide this process.
2.1 Line 5: Need to change the statement "Stroke is the leading health problem worldwide..." to "Stroke is a leading problem worldwide..." as stating it is THE leading problem is incorrect.
The statement was changed, as suggested, as follows: Page 4:
Stroke is a leading health problem worldwide and an important cause of long-term disabilities [1,2].

Page 3:
ABSTRACT
Introduction: Stroke is a leading health problem worldwide and an important cause of disability.

2.2 Line 12: Consider including the point that the majority of the growth of the global stroke burden is coming from developing countries.
This issue was addressed, as follows: Page 4:
Although stroke mortality rate has decreased, the majority of the growth of the global stroke burden is coming from developing countries and it is expected to increase as a result of demographic changes, such the increases in the aging population [1,2].

2.3 Line 16: Need to improve the final sentence in first paragraph - there is no discussion about the impact of stroke and the link to secondary conditions that makes a clear link built to the need for interventions. It needs an additional sentence prior to this last sentence that makes a better link to this statement.
Two additional sentences were added prior to the last sentence of the first paragraph to provide a clear link, as suggested. Pages 4 and 5:
Subjects with stroke are more likely to require help with daily activities and to have restrictions in participation, than controls, matched by socio-demographic characteristics and co-morbidities [3]. In addition, stroke survivors are at higher risks of having other cardiovascular diseases (CVDs), such as myocardial infarction and recurrent stroke [2]. Therefore, it is essential to develop interventions to recover and promote health and function, as well as to prevent secondary diseases in subjects post-stroke.

2.4 Paragraph 2 - consider using the ICF framework to better structure this paragraph - impairments, leading to reductions in physical activity and participation...and structure the cycle around this. Not all of the examples that you have provided are "disabilities" - eg reduced social participation is not a "disability", so this wording is not correct. Also, a useful paper here would be Jones TM, Dean CM, Dear BF, Hush JM, Titov N (2015) An internet survey of the characteristics and physical activity of community-dwelling Australian adults with acquired brain injury: exploring interest in an internet delivered self-management program focused on physical activity. Disability and Health Journal; DOI: 10.1016/j.dhjo.2015.08.004 which discusses the biggest barriers to physical activity being pain, fatigue and fear.

Some modifications were also carried-out in this paragraph, as recommended. The term "disabilities"
was used to refer to impairments, activity limitations, and restrictions in participation, based upon the ICF framework:
The components of Functioning and Disability reported in Part 1 of the ICF can be expressed in two ways. On one hand, they can be used to indicate problems (e.g. impairments, activity limitations, or participation restrictions, which are summarized under the umbrella term of disability); on the other hand, they can indicate non-problematic (i.e. neutral) aspects of health and health-related states, which are summarized under the umbrella term of functioning).

Common disabilities observed after stroke, including muscular weakness,[10] reduced cardiorespiratory fitness,[11] fatigue,[12] physical mobility limitations,[13,14] low perceptions of quality of life,[15] and restrictions in social participation,[3] may lead to low physical activity lifestyles [5]. Low levels of physical activity, in turn, have a negative impact on these disabilities and are related to health problems, and, therefore, create a vicious cycle [5].

2.5: Consider switching the order of paragraphs 2 & 3 - therefore discussing the low levels of activity first, then what causes them, which leads better into discussion regarding intervention. The order of the paragraphs 2 and 3 were switched, as suggested.

2.6: The word 'functionality' is a poor choice - consider replacing this with either function, or be clearer in your definition of what functionality actually is. The word 'functionality' was replaced by function, as suggested.

Page 3:
ABSTRACT
Introduction: Stroke is a leading health problem worldwide and an important cause of disability. Stroke subjects show low levels of physical activity, and increases in physical activity levels may improve function and health.

Page 5:
Therefore, it is essential to develop interventions to recover and promote health and function, as well as to prevent secondary diseases in subjects post-stroke.

Page 5:
Increase in physical activity levels can improve function and health in individuals after stroke [5].

Page 12:
Considering that physical inactivity is a major risk for recurrence of stroke and other cardiovascular diseases and may affect health and function [2,9,16], it is important to investigate the impact of different types of interventions on physical activity levels in post-stroke subjects.

Page 12:
The information from the qualitative synthesis, which will be developed to explore the results and relations within and between the included studies, will be important for clinical decision-making aiming at improving function and health status of subjects with stroke.

2.7: Need to be clearer in the reasons why this review needs to be done - what do we or don't we know yet in this space? This is important as there are other reviews in this space such as a Cochrane review by Morris et al (2014). There is currently no summary of what is known or not known in this space that clearly leads to the reason for this review to be done. The authors need to more clearly outline the current state of play.
Thank you for the indication of the reviews of Morris et al. (2014) and Jones et al. (2015). We considered both reviews in the introduction of this revised version of the manuscript, as follows: Page
However, according to our knowledge, no broad systematic reviews on this topic have been conducted. There was found only two specific systematic reviews that investigated the efficacy of interventions on physical activity levels in subjects with stroke: one targeted behavioral change [18] and the other self-management programs [19]. The results of both reviews showed, in general, improvements in physical activity levels after tailored counselling [18] and self-management programs [19]. Nevertheless, the risk of bias in the included studies was high in both reviews [18,19]. Therefore, the overall efficacy of those interventions to improve physical activity levels in subjects with stroke remains uncertain. In addition, these reviews had strict eligibility criteria, which may have prevented the inclusion of other relevant studies [18,19]. For instance, they included studies that had follow-up measures at three months or longer [18] and that only included community-dwelling subjects [19]. Therefore, the aims of the present systematic review are to identify which interventions have been employed to increase physical activity levels and to verify the efficacy of these interventions in individuals with stroke. The ultimate goal is to identify the gaps in the literature to allow for the planning and development of new clinical trials.

3. Methods

3.1: Types of studies - consider what you will do with studies that used a quasi-randomised strategy, eg date of birth? Quasi-randomized trials will be excluded from this review and this information was included in page 7, as follows:

Types of study
All randomized controlled trials (RCT) that investigated the efficacy of interventions aiming at increasing physical activity levels in subjects with stroke will be included in this systematic review. Quasi-randomized controlled trials, controlled clinical trials, cross-sectional studies, case series, and case reports will be excluded.

3.2: Participants - Consider studies that included mixed groups - eg chronic health conditions. You may need to specify that authors will be contacted for specific data relating to those with stroke, or that a certain proportion of the group needs to be stroke etc...or make ineligible unless all stroke?? Also, will you include TIA and/or those with mild stroke that make a full recovery? Studies with mixed groups will be included and specific data regarding the results of subjects with stroke will be requested to the authors. When these specific data are not available, the study will be excluded. Studies with subjects with transient ischemic attack (TIA) will not be included. There will be no further restrictions. This information was included in this revised version of the manuscript, as follows: Page 7:

Participants
All RCT, in which participants were adults (≥ 18 years of age) and survived a stroke, will be included, without further restrictions. The authors of the studies that included mixed groups will be contacted for specific data related to the stroke subjects. When specific data are not available, the study will be excluded. Studies with subjects with transient ischemic attack will also not be included.

3.3: Types of interventions - what about interventions that include things such as counselling, self-management, behavioural interventions etc? You may also need to specify whether you are restricting or not based on mode of delivery - eg face-to-face, groups, remote delivery etc There will be no restrictions to any type of interventions, such as counselling, self-management, or behavioral interventions, and mode of delivery. This information was added in this revised version of the manuscript, as follows: Page 7:
Types of interventions
All RCT that employed any type and mode of delivery, including, but not limited to aerobic, strength exercises, counselling, self-management, or behavioral interventions, in isolation or in combination, aimed at increasing physical activity levels, will be included. Trials will be excluded if the experimental interventions were invasive procedures, drug, and nutrition therapies.

3.4: The term 'physical activity needs to be defined earlier in the paper - perhaps in the intro, or earlier in the methods section.
The term “physical activity” was defined in the introduction section, as suggested. Page 5:
Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure, such as those performed during activities of daily living, at work, at home, during leisure activities, or transport [4]. Subjects with stroke have low levels of physical activity at both hospital and community settings [5,6].

3.5: Search strategy - will papers that are not in English, Spanish, or Portuguese be included or not?
Yes, there will be no language restrictions. This information was included in this revised version of the manuscript, as follows: Page 8:
Search strategy for the identification of relevant studies
Electronic searches will be conducted in the MEDLINE (via PubMed), Physiotherapy Evidence Database (PEDro), Excerpta Medica Database (EMBASE), Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), and Scientific Electronic Library Online (SCIELO) databases, from their inception to February 2016, without any language restrictions.

3.6: Line 25 - should state "...hand searches" not search
The word “search” was replaced by “searches”, as suggested. Page 8:
Hand searches of the reference lists of the included studies or relevant reviews will also be employed.

3.7: Risk of bias assessment - how will this be reported? Although PEDro does give an overall score - this is not an ideal way to present risk of bias but rather it is better to present each papers check on the individual items in order to provide greater transparency. This prevents a study seeming to have a high score, but yet failing substantially on one item that can cause a high risk of bias.
Thank you for your suggestion. The scores on the individual items of all included trials will be reported in a table. This information was included in this revised version of the manuscript, as follows: Page 10:
Risk of bias
The quality of the included RCT will be assessed by extracting the PEDro scores from the PEDro database (www.pedro.org.au). The PEDro rating scale is an 11-item checklist, which gives scores that range from zero to 10, designed for rating the methodological quality of trials. The RCTs, which have not been assessed by the PEDro rating scale, will be scored by the reviewers (LTA, JCM). Once again, disagreements will be discussed with the third reviewer (CDCMF). The scores on the individual items of the PEDro scale of all included trials will be reported in a table.
3.8: More detail is required as to how the qualitative synthesis will be done.

More details regarding the qualitative synthesis were included in this revised version of the manuscript, as follows: Page 11:

Strategy for data synthesis

This systematic review will also include a qualitative synthesis, which will provide information, both in text and tables, to summarize the results of the included studies. A narrative synthesis will be performed to explore the results and associations within and between the included trials.

3.9: RevMan software should be referenced

The reference was included in this revised version of the manuscript. Page 11:

Forest-plots and meta-analyses will be conducted, if the studies are sufficiently homogeneous regarding the interventions and outcomes and if sufficient data are available, to synthesize the direction, size, and consistency of the possible effects, using the Review Manager software (RevMan). [32].

4. Discussion

4.1 The statement that this is the first systematic review is incorrect - a Cochrane review by Morris et al. (2014) examined the effect of interventions on long-term participation in physical activity after stroke. Myself and others did a SR in 2015 examining the efficacy of self-management interventions on increasing physical activity after ABI, which was predominantly stroke and some TBI (Jones TM et al, 2015, Systematic Reviews).

As previously mentioned, the findings of both reviews were included in the introduction section of the new revised version, as follows: Page 6:

However, according to our knowledge, no broad systematic reviews on that topic have been conducted. There was found only two specific systematic reviews that investigated the efficacy of an intervention on physical activity levels in subjects with stroke: one of the interventions was behavior change [18] and the other was self-management programs [19]. Both reviews showed, in general, improvements in physical activity levels after tailored counseling [18] or self-management programs [19]. Nevertheless, the risk of bias in the included studies was high in both reviews [18,19]. Therefore, the overall efficacy of those interventions to improve physical activity levels in subjects with stroke remains uncertain. In addition, these reviews had strict eligibility criteria, which may have prevented the inclusion of other relevant studies [18,19]. Examples of these stringent eligibility criteria are the inclusion of studies that evaluated follow-up measures at three months or longer [18] and that included only community-dwelling subjects [19].

Therefore, the aims of the present systematic review are to identify which interventions have been employed to increase physical activity levels, and to verify the efficacy of these interventions in individuals with stroke. The ultimate goal is to identify the gaps in the literature to allow for the development of new clinical trials.

Furthermore, modifications were carried-out in the discussion section, to make clear what information this review will add. Pages 11 and 12:

According to our knowledge, this systematic review is the first to investigate the efficacy of broad types of interventions aimed at increasing physical activity levels in subjects with stroke. Previous systematic reviews with the aim to examine the efficacy of interventions on physical activity levels in subjects post-stroke, have investigated only two specific types of interventions: targeted behavioral change [18] and self-management programs [19]. However, the efficacy of those interventions to increase physical activity levels in post-stroke subjects continue to be unclear, due to the fact that the risk of bias of the included trials was high in both reviews [18,19]. Moreover, important trials might not have been included because of the stringent eligibility criteria of these reviews [18,19]. These factors
limit the interpretation of the findings regarding the impacts of interventions on physical activity levels in post-stroke subjects. Considering that physical inactivity is a major risk for recurrence of stroke and other cardiovascular diseases and may affect health and function [2,9,16], it is important to investigate the impact of different types of interventions on physical activity levels in post-stroke subjects.

4.2 The discussion needs to build more on what this review can add, that hasn't already been added by prior reviews in this space.

Modifications were carried out in the discussion section, to make clear what this review can add, considering the previously published reviews. Pages 11 and 12:

According to our knowledge, this systematic review is the first to investigate the efficacy of broad types of interventions aimed at increasing physical activity levels in subjects with stroke. Previous systematic reviews with the aim to examine the efficacy of interventions on physical activity levels in subjects post-stroke, have investigated only two specific types of interventions: targeted behavioral change [18] and self-management programs [19]. However, the efficacy of those interventions to increase physical activity levels in post-stroke subjects continue to be unclear, due to the fact that the risk of bias of the included trials was high in both reviews [18,19]. Moreover, important trials might not have been included because of the stringent eligibility criteria of these reviews [18,19]. These factors limit the interpretation of the findings regarding the impacts of interventions on physical activity levels in post-stroke subjects. Considering that physical inactivity is a major risk for recurrence of stroke and other cardiovascular diseases and may affect health and function [2,9,16], it is important to investigate the impact of different types of interventions on physical activity levels in post-stroke subjects.

The results of this systematic review will provide comprehensive and rigorous evidence regarding which types of interventions, and/or specific protocols have been investigated and are effective for increasing physical activity levels of subjects with stroke. The information from the qualitative synthesis, which will be developed to explore the results and relations within and between the included studies, will be important for clinical decision-making aiming at improving function and health status of subjects with stroke. Moreover, if sufficiently homogeneous data to conduct meta-analyses is available, clinicians will have information reading the expected effect size associated with a given intervention.

**REVIEWER 2**

Reviewer Name: Karen Borschmann  
Institution and Country: The Florey Institute, Australia  
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Thank you for your plans to undertake a systematic review and meta-analysis of methods to increase physical activity after stroke. This is an important gap in evidence. There are a few points that I think will enhance your manuscript:

First, we would like to thank the reviewer for all her pertinent comments. We are glad to know that this paper was considered important.

1. Stroke is not THE (number 1) leading health problem. Please change the first sentence to “Stroke is a leading health problem…”

The first sentence was changed, as suggested. Page 4:

Stroke is a leading health problem worldwide and an important cause of long-term disabilities [1,2].

Page 3:
ABSTRACT
Introduction: Stroke is a leading health problem worldwide and an important cause of disability.

2. Page 5: third chapter. Although physical activity is low after stroke compared to population-based studies, this only suggests (it does not prove) that physical activity is reduced after stroke. Without knowing how active people are before their stroke, we cannot say that stroke caused them to become inactive. Please change or remove the last sentence in this chapter.
We did not mean that physical inactivity is caused by stroke. We agree that physical activity levels prior to stroke influence the physical activity levels after a stroke. The last sentence of the paragraph was re-written, to better convey the message, as follows: Page 5:
Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure, such as those performed during activities of daily living, at work, at home, during leisure activities, or transport [4]. Subjects with stroke have low levels of physical activity at both hospital and community settings [5,6]. The quantity, duration, and intensity of physical activities are reduced, even in high functioning community-dwelling stroke subjects [7]. According to a population-based study, community-dwelling stroke survivors have the highest proportion of physical inactivity, when compared with older adults with diabetes, musculoskeletal, cardiovascular, respiratory, or other neurological chronic diseases [8]. These results illustrate how physical activity levels are low after stroke.

3. Page 7: outcome measures. Sedentary time, separate to physical activity, appears to be important for health outcomes. Please state whether sedentary time would be included as an outcome measure. Although we agree that sedentary time is an important outcome, we did not plan to include this variable as an outcome measure. This information was included in the “Outcome measures” sub-heading, as follows: Page 8:
Trials reporting walking or exercise capacity, gait patterns, or ability to perform activities of daily living (e.g., Barthel or Functional Independence Measure scores), which are not measurements of physical activity levels, will be excluded. Studies reporting only sedentary time will also be excluded.

4. Page 7: outcome measures. You state that exercise capacity will not be included as an outcome measure, however, search terms 28 - 32 on page 19 include physical fitness measures. Please revise this section, or explain why physical fitness is included in the search.
Although exercise capacity will not be included as an outcome, the term “physical fitness” will included in the search strategy, to guarantee a broader search and access all the relevant trials. In addition, we would like to use a search strategy related to physical activity levels with a combination of terms employed in three previously published systematic reviews.

5. Page 10. Which trail register will be screened to asses whether selective reporting is present?
The trial register that will be screened to assess whether selective reporting is present will be ClinicalTrials.gov. This information was included in the “Risk of bias” sub-section, as follows: Page 10:
In an attempt to determine if reporting bias is present in the included trials, the trial register “ClinicalTrials.gov” will be screened to assess whether selective reporting is present.

VERSION 2 – REVIEW

REVIEWER | Karen Borschmann  
The Florey Institute of Neuroscience and Mental Health

REVIEW RETURNED | 23-Jul-2016

GENERAL COMMENTS | Thank you for the opportunity to re-review this paper. The
The manuscript is improved from its first version. I have made a few minor suggestions to enhance a couple of sections of the paper:

1. Abstract and throughout the manuscript: please use the term “stroke survivor” rather than “stroke subject”

2. Introduction:
The sentence “The quantity, duration, and intensity of physical activities are reduced…” is incomplete. Compared to what are they reduced? I assume that you mean that they are lower than aged matched controls? If so, please make this clear. You could remove the sentence “These results illustrate…”

3. The introduction introduces the main important points related to physical inactivity and stroke but there is some repetition which detracts from the quality of the writing (eg that physical inactivity is a risk for recurrent stroke). Reduction of repetition would improve the succinctness and clarity of the introduction.

4. Risk of bias: given that a lot of post-stroke physical activity is completed in Australia and Europe, I suggest that www.anzctr.org.au and https://www.clinicaltrialsregister.eu are also searched.

5. Discussion: last sentence of second last paragraph: should this be “…clinicians will have information regarding the expected…”

Reviewer Name: Karen Borschmann
Institution and Country: The Florey Institute of Neuroscience and Mental Health
Please state any competing interests: None declared

Please leave your comments for the authors below:
Thank you for the opportunity to re-review this paper. The manuscript is improved from its first version. I have made a few minor suggestions to enhance a couple of sections of the paper:

First, we would like to thank the reviewer for all of the relevant comments.

1. Abstract and throughout the manuscript: please use the term “stroke survivor” rather than “stroke subject”
The term “stroke subject” was replaced by “stroke survivor”, on the abstract and throughout the manuscript, as suggested.

2. Introduction:
The sentence “The quantity, duration, and intensity of physical activities are reduced…” is incomplete. Compared to what are they reduced? I assume that you mean that they are lower than aged matched controls? If so, please make this clear. You could remove the sentence “These results illustrate…”

Modifications were carried-out in the second paragraph of the introduction section, to make the sentence clear:

The quantity, duration, and intensity of physical activities are reduced, even in high functioning community-dwelling stroke survivors, when matched by healthy elderly [7].

The sentence “These results illustrate how physical activity levels are low after stroke” was removed, as suggested.

3. The introduction introduces the main important points related to physical inactivity and stroke but there is some repetition which detracts from the quality of the writing (eg that physical inactivity is a risk for recurrent stroke). Reduction of repetition would improve the succinctness and clarity of the
introduction.

Some modifications were carried out in the introduction section, to reduce repetition, as suggested. The removed parts are highlighted in red.

Stroke survivors are more likely to require help with activities and to have restrictions in participation than matched controls, by socio-demographic characteristics and comorbidities [3]. In addition, stroke survivors are at higher risks of having other cardiovascular diseases (CVDs), such as myocardial infarction and recurrent stroke [2].

Increase in physical activity levels can improve function and health in individuals after stroke [9]. Furthermore, once physical inactivity is a major risk for stroke, [2] increases in physical activity levels could reduce the recurrence of stroke and other CVDs [16].

4. Risk of bias: given that a lot of post-stroke physical activity is completed in Australia and Europe, I suggest that www.anzctr.org.au and https://www.clinicaltrialsregister.eu/ctr-search/search registries are also searched.

Thank you for the suggestion. Both trial registers were included in the risk of bias section.

In an attempt to determine if reporting bias is present in the included trials, the trial registers “ClinicalTrials.gov”, “www.anzctr.org.au”, and “www.clinicaltrialsregister.eu/ctr-search/search” will be screened to assess whether selective reporting is present.

5. Discussion: last sentence of second last paragraph: should this be “…clinicians will have information regarding the expected…”

The word “reading” was replaced by “regarding”.

Moreover, if sufficiently homogeneous data to conduct meta-analyses is available, clinicians will have information regarding the expected effect size associated with a given intervention.
Efficacy of interventions to improve physical activity levels in individuals with stroke: a systematic review protocol

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