Author's response to reviews

Title: Participation levels of physical activity programs for community-dwelling older adults: a systematic review

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Author's response to reviews: see over
We would like to thank the editor and reviewers for their dedicated work and their constructive suggestions and comments. Below, we will systematically give our reaction to each of the suggestions.

REVIEWER#1 Freya MacMillan

Dear reviewer,

Thank you for your dedicated work and constructive suggestions and comments aimed at improving the manuscript. Below, we will systematically give our reaction to each of the suggestions. Since there was some overlap in remarks of reviewer 1 and 2, we have indicated where our response to reviewer 2 also applies to reviewer 1.

Reviewer's report:

Thank you for the opportunity to review this paper, which examined participation rates of physical activity programs for community-dwelling older adults. This is an important research area and the findings will be of interest to researchers interested in developing physical activity interventions for older adults. In order for this paper to be published, amendments are necessary first.

Major Compulsory Revisions

1. I am concerned that the search has not captured all relevant papers. For example the following papers are missing from this review:

   Both of these are examples of physical activity interventions for community-dwelling older adults. It may be that these papers were excluded from the review for some reason, but as the methods are currently written I cannot see why. This is worrying in terms of the effectiveness of the search strategy.

   We apologise for not being clear in our manuscript that we excluded studies in which the setting was primary care. We only included PA programs that were community-based, therefore PA programs in a primary care setting such as reported in McMurdo et al. (2010) and Mutrie et al. (2012) were excluded. To make this more clear in the manuscript, we changed in the methods section:

   ‘conducted among community-dwelling populations;..’

   Into

   ‘conducted among community-dwelling populations (i.e. not in a primary care setting and/or assisted living or nursing home);..’
If you have not done so already, I would suggest going through reference lists of previously published systematic reviews of physical activity interventions in older adults to check that you have captured all articles published prior to March 2013. Add this in to your methods section as a strategy to ensure you have captured all suitable articles. Such review include:

- Andre Matthias Müller and Selina Khoo. Non-face-to-face physical activity interventions in older adults: a systematic review

You could also email authors of included studies to ask if they know of any other relevant articles that you have missed or do a citation search to see if other relevant articles come up that have referenced the articles that you have included in the review. I am not suggesting that you need to do all of these but if indeed the papers I have noted above were not found by the current search strategy then I highly recommend you make some adjustments in order to capture them and any other relevant papers that have been missed.

We did check reference lists of systematic reviews by for example Daniels et al. (2008) and Bean et al. (2004) which did not result in extra studies eligible for inclusion. Besides, as the reviewer suggested we went through the reference lists of Müller & Khoo (2014) and Stevens et al. (2014). Based on the titles, 10 articles were further screened but were excluded because 5 programs did not involve a physical activity, participants of three studies were among adults aged under 55 years, 1 study did not study a PA outcome, and one study was published after April 2013.

Also, we emailed the corresponding authors of the included studies which resulted in 3 extra studies for further screening. One study was already excluded during our reviewing process. The other two studies did not meet our inclusion criteria because one targeted adults with a specific medical condition (Kyrdalen et al., 2013) and the other study did not include a PA program (Pasalich et al., 2014).

To report on this extra search, we added to the method section:

‘All corresponding authors of included studies were contacted and reference lists of previously published systematic reviews were checked to make sure all relevant articles were captured. This extra search did not result in extra studies eligible for inclusion.’

**Minor Essential Revisions**

**Abstract**

2. First sentence: Change ‘had’ to ‘have.’

‘had’ has been replaced by ‘have’.

3. Methods, second sentence: insert ‘of’ before ‘participants’

We inserted ‘of’ before ‘participants’.
4. Results, second sentence: change ‘initial participation’ to something like ‘The number of participants at baseline/enrolled in studies ranged between 24 and 582 persons.’ You state in the third sentence that initial participation could not be calculated so do not use ‘initial participation’ in the preceding sentence – this is confusing for the reader.

Thank you for noticing. We changed ‘initial participation’ into ‘The number of participants enrolled in the PA programs’.

**Background**

5. Paragraph 2, first sentence: change ‘had’ to ‘have.’ Third sentence: avoid use of ‘low-intensity’ and ‘high-intensity’ unless you are referring to physical exertion here (If so then fine, leave as is)? Rather, do you mean limited and high contact?

‘had’ has been replaced by ‘have’.

6. Please provide rationale/references for why you have selected 55 years and above to define old age – is this based on the definition of older adults in the PA recommendations?

This is based on previous research which showed low levels of physical activity and a higher risk of adverse outcomes (e.g. frailty and disability) among those from the age of 55 years (Etman et al., 2012; Odding et al., 2001). Therefore, in order to prevent a decrease in physical activity and related increase in adverse health outcomes, preventive measures should focus on those aged 55 years and older.

We added to the background section:

‘Preventive measures aimed at increasing PA levels should focus on those aged 55 and older since they have been found to be at increased risk of adverse outcomes such as frailty and disability (5,6).’

**Methods**

1. What is meant by ‘no review protocol existed to be used?’ Did you not make your own review protocol to follow? Do you mean ‘no review protocol has been published?’

We mean that we made our own search strategy to follow. In order to avoid confusion about this sentence, it was deleted from the text.

2. The Pubmed search has ‘home or community’ and ‘residential’ listed twice.

Thank you for addressing this. You are right that this search strategy can be shortened in case of ‘home or community’. We tested the new search strategy which resulted in an identical number of hits. However, listing ‘residential’ once would decrease the number of hits, therefore we did not make any changes to that part of the search strategy. We may not capture all studies including community-dwelling older adults by leaving one out.

We changed:

‘(((communit* OR home) AND (dwell* OR residen* OR based OR population*)) OR ((living) AND (home OR communit*)) OR (residential* NOT (care OR home OR facilit*)) OR in home OR at home OR domestic*))’

Into
‘(((communit* OR home) AND (living OR dwell* OR residen* OR based OR population*)) OR (residential* NOT (care OR home OR facilit*)) OR in home OR at home OR domestic*))’

3. Insert ‘:’ after ‘included’ in first sentence of study selection section and use ‘;’ rather than ‘,’ to split up the list. Use ‘:’ and ‘;’ to break up the second sentence too. Rather than ‘including study protocol’ do you mean ‘articles reporting on study protocols?’

We added the suggested punctuations in the first and second sentence of the study selection section. Indeed, we referred to articles reporting on study protocols, therefore we changed:

‘including study protocol’

Into

‘reported on study protocols’

4. What do you mean by ‘component of PA.’ Give examples (e.g. do you mean a measure of PA frequency, intensity, duration, type or fitness outcome).

In the abstract and methods section, to ‘….at least one component of PA’, we added ‘(e.g. frequency, duration)’

5. Did the second reviewer screen a random sub-set of abstracts? Currently the paper states that the second reviewer was consulted only in cases of doubt. It would be better if the second reviewer was to review a sub-set of abstracts to ensure they agree with the initial reviewer’s decisions, regardless of if the first reviewer is in doubt or not, to ensure there was no bias in the screening phase.

We apologise that the role of the second reviewer is not fully clear. The second reviewer did screen a random sub-set of abstracts. To make this more clear, we changed

‘One reviewer (MvdD) performed the initial selection of abstracts in the literature search. In case of doubt a second reviewer (AE) was consulted.’

Into

One reviewer (MvdD) performed the initial selection of titles and abstracts in the literature search. A second reviewer (AE) was consulted to screen a random sub-set, and in case of doubt to discuss until agreement was reached.’

6. Please define clearly in the methods what you mean by ‘convenience’ and ‘probability’ sampling to make this clear to the reader.

We added:

‘Probability sampling is a method of sampling that utilizes some form of random selection, whereas convenience sampling is a technique where subjects are selected because of their convenient accessibility and proximity to the researcher (e.g. inviting through advertisements).’

7. Participation levels section: what about number of persons in the total available sample (e.g. the total sample aged 55+ regardless of eligibility status) and the number of eligible persons? It would
be interesting to report this for the studies that include this information, to indicate the % older adult population that are likely capable of participating in such a study. You mention the lack of reporting of this information in the discussion section so I believe it was an aim of your paper and should therefore be stated in the methods – that you would also look for data on the total available and eligible sample (and then in results state that none of the papers reported this data). That is a very important finding – future researchers need to collect and report this data.

Actually, we reported on number of persons available for participation. We refer to the persons ‘available’ (as mentioned by the reviewer) as ‘persons invited to participate’ in the manuscript. To make this more clear we added to the methods section:

‘i.e. available sample’ behind ‘number of persons that were invited’

The exact numbers of persons available for participation are reported in Table 1 as being the denominator of the calculation of initial participation.

Only for three programs different numbers were reported for number of eligible persons and number of participants at baseline. For the other 14 PA programs there was no difference between the number of eligible persons and number of participants at baseline. Because of the small number of studies reporting different numbers on eligible persons and participants in baseline, we think it of less interest to also report on number of eligible persons.

Also in the last sentence in this section, insert ‘that’ before ‘started the program.’

We inserted ‘that’ before ‘started the program’.

8. What is the difference between PubMed and PubMed publisher? Did you mean MEDLINE, PubMed and/or PubMed Central?

In the PubMed search the most recent studies could be overlooked. Additionally, PubMed publisher was searched to find the most recent articles that were already added by the publishers but have not yet been indexed for MEDLINE, using the subset ‘as supplied by publisher’ (publisher[sb]).

9. Risk of bias section: The first sentence is not very clear to me – please re-word. Did you actually check for publication bias? Regardless of whether you think it’s likely or not you should still check. Have you considered potential design issues that could have resulted in bias in the participation data? E.g. in studies that used flyers, were the number of flyers given out recorded? Did studies that used multiple methods of recruitment state the number of participants recruited using each method (e.g. n=12 were recruited via letter, n=4 recruited via poster etc)? Or again have studies failed to report on this information, in which case you should recommend more detailed reporting in future.

We apologise for this part being unclear to the reader. Our main message here is that the chance of selection bias affecting our results is small since we do not expect the selection of studies for publication is based on the participation level. Thus, although there is a possibility that due to publication bias this review included mainly effective PA programs, it is unlikely that this publication bias would affect our results since no differences in participation level are to be expected between effective and non-effective PA programs.
To make this more clear in the manuscript, we rewrote the following text:

‘We checked the availability of the data needed which may be the result of selective reporting of data needed to calculate participation levels. Since the main focus of studies is the effect of the PA programs on health outcomes (and not participation levels), it is unlikely that publication bias has affected our results.’

Into

‘Studies reporting significant effects of PA programs on PA outcomes are more likely to be published as compared to studies in which no significant results were found. However, it is unlikely that this publication bias would affect our results since we focused on participation level as the main outcome, and no differences in participation level are to be expected between effective and non-effective PA programs.’

10. In the statistical analysis section: insert a ‘:’ after ‘and’ and use ‘;’ instead of ‘,’ for the list of characteristics.
We inserted a ‘:’ after ‘and’ and use ‘;’ instead of ‘,’ for the list of characteristics.

Results
11. Please avoid use of first person throughout the paper (such as in the third sentence of the ‘literature search’ section in ‘Results.’). Also delete the word ‘finally’ in this sentence.
A native speaker checked the whole manuscript and rewrote parts where first person was used. The word ‘finally’ was deleted.

12. ‘Characteristics of participants and programs’ paragraph: please write out ‘five’ rather than using ‘5’.
We wrote out ‘five’.

Tables
13. Please make sure you have included how recruitment was done in the ‘Way of recruitment’ column. I suspect that not all papers have included this information and this is why the method of recruitment is not currently reported for all included papers. If this is the case could you add ‘method not reported’ or similar in this column to make it clear to the reader that the author did not report it. For example, for the study by Burke et al., 2013 the ‘way of recruitment’ column states that participants were recruited from 60 suburbs, but how were they recruited (e.g. flyers, telephone etc)? It is essential to have as much detail as possible in this column to gain an idea of how best to recruit participants in to such studies.
In case no information about the detailed method of recruitment was reported, we added in the column ‘way of recruitment’: ‘(method not reported)’

14. Throughout the table in the ‘Way of recruitment’ column replace ‘send’ with ‘sent’
We replaced ‘send’ with ‘sent’.
15. Row for Hernandes 2012: Please change ‘a other project’ to ‘another project’
We replaced ‘a other project’ with ‘another project.’

16. Please add in age range of participants from each study to the table.
To the table we added age ranges or stated ‘range not reported’ in case the age range was not reported.

Figure
17. The reasons for excluding full text articles are not currently provided in the flow diagram. This information is essential.
Since we had to stick to the format of BMC Public Health (PRISMA 2009 Flow Diagram), there is no room for explaining reasons for excluding full text articles. We do have a more detailed figure, however it does not fit to the publication guidelines.

Discussion
18. Last sentence of the first paragraph: edit wording to ‘….and group size are likely important in determining sustained participation.’
A similar remark was also made by reviewer 2 and addressed in comment 15.

19. Paragraph 3, second sentence: delete ‘and’ before ‘higher sustained...’
We deleted ‘and’ before ‘higher sustained’.

20. Paragraph 4. Insert a full-stop after ‘invested’ and start the next sentence with ‘For example...’
Also change ‘phone’ to ‘phoning’ in this sentence.
We inserted a full-stop after ‘invested’ and started the next sentence with ‘For example...’. In addition we changed ‘phone’ into ‘phoning’.

21. The final sentence of this section needs relating back to the findings of this review. E.g. in your review did any of the included papers include online components? If not state this. If they did say what they were and how successful they were.
We changed in the discussion section:
‘Furthermore, it is of interest to study the growing implementation of online PA programs (33) which potentially increase the ease of initial participation.’

Into

‘Although, none of the included PA programs in this current systematic review included online components, it is of interest to study the growing implementation of online PA programs (34) which potentially increase the ease of initial participation.’

Discretionary Revisions
22. I do not think it was necessary to include the community/home, dwelling, or effectiveness related keywords. You would most likely have captured all the studies that you included in the review with keywords relating to older age, physical activity and intervention design....you may have done more work than you needed too!
Thank you for this comment. To carry out the search strategy, we contacted a specialized librarian who helped us building the search strategy. In order to be sure that all possible relevant studies were captured, we included as much related keywords as possible. The reviewer may be right that we did more work than needed.

**REVIEWER#2 Jonine Jancey**

Dear reviewer,

Thank you for your dedicated work and constructive suggestions and comments aimed at improving the manuscript. Below, we will systematically give our reaction to each of the suggestions. Since some remarks were also made by reviewer 1, we have indicated where our response to reviewer 1 also applies to reviewer 2.

**Reviewer’s report:**

Thank you for the review. I have a few things that need clarification. In particular, the discussion is very difficult to understand and requires a thorough review. I also think it is very important to clearly explain in the flow chart why articles were excluded.

**Major**

1. I am not sure of the aim of this study as it changes in document e.g. Aim in abstract does not match that on page 3 para 2

On page 3, paragraph 2, the following sentence was changed:

‘Therefore, we conducted a systematic review to determine participation levels of PA programs for community-dwelling older adults aged 55 years and older and to determine characteristics of PA programs with high initial and sustained participation levels.’

Into

‘Therefore, a systematic review was conducted to determine participation levels of PA programs aimed to improve PA among community-dwelling older adults aged 55 years and older. Furthermore, PA programs with high initial and sustained participation levels were characterised.’

**Methods**

2. How were the key words established?

3. How were the databases established?

Both key-words and databases were established by a librarian of the Erasmus University MC. To the acknowledgements we added:

‘Many thanks to Wichor Bramer, a librarian of the Erasmus University MC who helped establishing the key-words and the databases.’

4. Definition of community dwelling?
In the ‘study selection’ method we changed:

‘2) conducted among community-dwelling populations’
Into

‘2) conducted among community-dwelling (i.e. not in a primary care setting and/or assisted living or nursing home)’

Risk of bias

5. I am unsure of the meaning of this statement ‘Since the main focus of studies....affected our results.’ This statement needs to be reviewed and explained.
This remark was also made by reviewer 1 and addressed in comment 9.

Statistical analysis

6. Once again this statement is unclear ‘Also, the sustained participation level of PA programs reporting at least one significant effect for PA outcome was calculated’.
We changed

‘Also, the mean sustained participation level of PA programs reporting at least one significant effect for a PA outcome was calculated.’
Into

‘Mean sustained participation level was calculated for all PA programs as well as for effective PA programs only.’

7. Why are you looking specifically at females as this does not relate to the aim of the study?
We apologise for the misunderstanding. We did not look specifically into females, however we checked for gender distribution among participants in order to get insight in population characteristics related to participation levels. To make this more clear we changed the following sentence:

‘Pearson correlations were calculated in order to investigate the correlation between participation levels and proportion females participating, mean age of the participants, program duration, and group size. ‘
Into

‘Pearson correlations were calculated in order to investigate the correlation between participation levels and: gender distribution of the participants; mean age of the participants; program duration; and group size.’

8. Figure 1 lacks detail – Require explanation for the reason for the exclusion of papers.
This remark was also made by reviewer 1 and addressed in comment 17.


**Results**

9. Para 1 – There needs to be more explanation relating to the presented data as otherwise it is meaningless. What are the ‘Multi-faceted activities - needs to be explained. What does ‘seven programs had different content’ mean?

We changed

‘Three programs offered a walking group (14, 16, 26), seven programs offered multifaceted activities (12, 13, 16, 19, 21, 22, 28), and seven programs each had a different content (15, 16, 20, 23-25, 27). As shown in table 1, also other program characteristics varied between the PA programs.’

Into

‘Three programs involved group-walking (16, 20, 28), seven programs involved multifaceted activities such as a combination of education and a training program (14, 15, 18, 21, 23, 24), and seven programs involved various PA activities such as a pedometer intervention or different exercise programs (17, 19, 22, 25-27, 29) (Table 1).’

10. Para two – what were the PA outcomes?

To paragraph 2 we added:

‘PA outcomes that were evaluated were: general PA level (n=9); walking (n=6); and household and sports activities (n=1).’

11. What do initial participation levels mean?

We hope we made clear what we mean by initial participation levels by stating in the methods section (‘participation levels’):

‘Initial participation was defined as the number of participants that enrolled in the program divided by the number of persons invited to participate.’

12. There are some very obvious study omissions and therefore I wonder how many other studies were not included. A couple of suggested studies


No full texts were found for the articles Jancey et al. 2008 and Jancey et al., 2011. We sent the corresponding author an email, however that resulted in an error. Therefore we were not able to
screen the full text. It seems plausible that this reviewer is the corresponding author of these studies, so if the reviewer would like to send the articles, we would be pleased to assess the two studies for eligibility. The study by Lee et al., 2011 did not target a PA component (e.g. walking group, exercise class) instead the intervention contained a booklet to advise the participant about physical activity.

13. Table 1 - lack of detail around the content of the some of the interventions e.g. ‘community based exercise program’; ‘combined training.’ Once again to inform the reader and make it useful then the manuscripts needs to present more relevant information.
In table 1, we added more details to the description of the contents of the PA programs.

Discussion
14. The discussion needs a thorough review as it is very difficult to understand.
A native speaker has checked the whole manuscript and revised where needed to improve grammatical, phrasing, and scientific writing.

What does initial participation mean?
In the first paragraph we changed

‘The mean initial participation levels was 9.2%,..’

Into

‘The mean proportion of participants starting the program (initial participation level) was 9.2%,..’

The correlations needs to be explained
a) Duration of program – what length of program?
b) Group size – what size big, small?
c) What age?
d) What proportion of females - less or more?
To explain the correlations in more detail, we changed:

‘..., but the size of the correlations indicated that mean age and proportion females of the participants, duration of the program, and group size are likely to be relevant for sustained participation.’

Into

‘..., but the size of the correlations indicated that a low mean age of the participants, high proportions of females participating, short duration of the program, and a small group size are likely to increase levels of sustained participation.’

15. Para two seems to be repeating para one.
We slightly changed the composition of the first paragraph by partly adding paragraph 2. We changed:
'This systematic review identified seventeen PA programs that aimed at improving PA among community-dwelling older adults. The mean initial participation levels was 9.2%, but could only be calculated for five PA programs. The seventeen PA programs had a mean sustained participation level of 79.8%. No significant correlations were found for participant or program characteristics with sustained participation level, but the size of the correlations indicated that mean age and proportion females of the participants, duration of the program, and group size are likely to be relevant for sustained participation. No significant correlations of participant or program characteristics with sustained participation levels were found which may be due to the small number of studies that were eligible for inclusion. Inclusion of a larger number of studies may result in significant correlations.'

Into

'This systematic review identified 17 PA programs that aimed to improve PA among community-dwelling older adults. The mean proportion of participants starting the program (initial participation level) was 9.2%, but could only be calculated for five PA programs. The 17 PA programs had a mean sustained participation level of 79.8%. No significant correlations were found for participant or program characteristics with sustained participation level, but the size of the correlations indicated that lower mean age of the participants, higher proportions of females participating, shorter duration of the program, and group size are likely to increase levels of sustained participation. The small number of studies that were eligible for inclusion may have resulted in finding no significant correlations.'

16. Discussion around initial participation (page 7 line 176-179) needs to be supported by references.
Unfortunately we could not find literature supporting our statement. In order to make it slighter milder we changed ‘is’ into ‘seems’. Besides that future studies should report on initial participation, further research is needed to investigate differences in initial participation by way of recruitment.

17. Not sure why the RE AIM framework is suddenly introduced.
We agree that the RE AIM may be outplaced. Therefore we removed it from the discussion section, by changing:

‘The initial participation level of 9.2% is difficult to interpret without additional information about the way of recruitment and effort or resources invested, for example 9.2% is high when recruitment is done by putting up an advertisement in a community building, but low when mailing people personally and subsequently phone them. For twelve PA programs important information was missing concerning initial participation level which is striking since information on initial participation gives insight in potential selective participation and in the external validity of the results. The importance of reach, defined as the proportion of eligible people in the target population who participate in a program and extent to which those participants represent the target population (31), is also stressed by the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework for evaluating the public health impact of health promotion interventions. ...’
‘The initial participation level of 9.2% is difficult to interpret without additional information about the way of recruitment and effort or resources invested, for example 9.2% is high when recruitment is done by putting up an advertisement in a community building, but low when mailing people personally and subsequently phone them. Although for public health impact it is important to have insight in the number of older adults that would participate when providing a PA program (31), for twelve PA programs important information was missing which is striking since information on initial participation gives insight in potential selective participation and in the external validity of the results. …’

18. Conclusion – the conclusion does not inform the aim.

We changed:

‘Little is known about initial participation levels of PA programs aimed at improving PA levels among community-dwelling older adults. Sustained participation among those who started participating in PA programs is high. In order to improve the population impact of PA programs among community dwelling older adults, more knowledge is needed about how to optimize initial and sustained participation levels.’

Into

‘Calculating initial participation levels of PA programs aimed to improve PA levels among community-dwelling older adults is hampered by high levels of convenience sampling. Sustained participation among those who started participating in PA programs is high. A low mean age of participants, high proportions of females participating, short duration of a program, and a small group size are likely to increase levels of sustained participation. In order to improve the population impact of PA programs among community-dwelling older adults, more knowledge is needed into how initial and sustained participation levels can be optimized.’

Minor

Number less than 10 are written in text.

We checked the whole manuscript and rewrote all number less than 10 which were not written in text.

REVIEWER#3 Natasha Reid

Dear reviewer,

Thank you for your dedicated work and constructive suggestions and comments aimed at improving the manuscript. Below, we will systematically give our reaction to each of the suggestions. Since some remarks were also made by reviewer 1, we have indicated where our response to reviewer 1 also applies to reviewer 3.
Reviewer's report:
Critical phrasing, grammatical, and scientific writing errors are present in this paper. The authors do not exemplify the importance of the research or relevant future directions. I recommend major revisions with a significant focus on improving the scientific writing style.

Major Revision requiring attention:
Grammatical, phrasing and scientific writing improvements throughout this manuscript are essential before the publication of this paper.
We agree that the manuscript should be of high quality to be published in BMC Public Health. Therefore, a native speaker has checked the whole manuscript and revised where needed to improve grammatical, phrasing, and scientific writing.

Minor essential revisions:
Abstract
Line 33: The sentence “Both proportions participants (initial participation) and completing (sustained participation) the PA program were investigated” is unclear and poorly phrased.
We changed ‘Both proportions of participants starting (initial participation) and completing (sustained participation) the PA programs were investigated.’
Into
‘Proportions of participants starting and completing the PA programs (respectively initial and sustained participation) were determined.’

Introduction
Line 55: Change the word “had” in “Many PA programs had been implemented..” to “have”
We changed ‘had’ into ‘have’

Line 56-57: The two sentences linked by a comma do no link very well. Consider revising
Besides lines 56-57 we also revised line 55 by changing:
‘Many PA programs had been implemented and tested for effectiveness (5). However, strikingly little is known about the participation levels of these programs (6-7), although initial participation and sustained participation (participants starting the program and participants completing the program (8)), are important for achieving public health impact.’
Into
‘Initial and sustained participation is important for achieving public health impact (7). However, although many PA programs have been implemented and tested for effectiveness (8), strikingly little is known about the participation levels of these programs (9,10).’

**Line 61:** The word “input” in this context doesn’t seem correct, consider replacing with “knowledge”.
We changed

‘As such, the identification of PA programs with high levels of participation is important input for the development of future PA programs.’
Into

‘As such, the identification of PA programs with high levels of participation is important for the development of future PA programs.’

**Line 62-64:** Consider writing aims in a more easy-to-read manner.
To improve the readability of the aims we rewrote lines 63-64 from:

‘Therefore, we conducted a systematic review to determine participation levels of PA programs for community-dwelling older adults aged 55 years and older and to determine characteristics of PA programs with high initial and sustained participation levels.’

Into

‘Therefore, a systematic review was conducted to determine participation levels of PA programs aimed to improve PA among community-dwelling older adults aged 55 years and older. Furthermore, PA programs with high initial and sustained participation levels were characterised.’

**Method**
**Data extraction**
**Line 94:** Were any other characteristics examined? E.g., education, income etc?
Although we did look into education and income, unfortunately the information was too diverse to make comparisons (e.g. years of education vs. % finished high school). Besides, only 7 and 3 studies reported on education and income respectively. Therefore it was impossible to compare programs based on this characteristic, as such we did not include this in our study.

**Line 95:** Consider changing the word “way” to “method”
We changed ‘way of sampling’ into ‘sampling method’

**Comment:** what were the agreement rates between the reviewers? Were any quality assessments of the included papers conducted? If so, include this information in the manuscript.
Randomly 100 titles+abstracts were selected and screened by MvdD and AE. Results were compared which resulted in 76% initial agreement meaning that both researchers judged 76 studies exactly the same. Summing the number of studies doubted by one or both researchers, resulted in 14% which needed more detailed screening and discussion until agreement was reached. And for the remaining
10% there was initial disagreement, also resulting in a discussion until agreement was reached. No quality assessments of the included studies were conducted.

**Participation levels and Risk of bias**

These sections are generally poorly phrased and require revision.

The remark concerning the Risk of bias section was also made by reviewer 1 and addressed in comment 9.

The participation levels section was rewritten from:

‘In order to calculate participation levels, numbers of persons invited to participate, started the PA program, and completed the PA program were used. Initial participation was defined as the number of participants entering the program divided by the number of persons invited to participate. Sustained participation was defined as the number of participants who completed the program divided by the number of participants that started the program (8).’

Into

‘In order to calculate participation levels the following measures were used, numbers of persons that: 1) were invited to participate (i.e. available sample); 2) started the PA program; and 3) completed the PA program. By using these measures initial and sustained participation levels were calculated. Initial participation was defined as the number of participants that enrolled in the program divided by the number of persons invited to participate. Sustained participation was defined as the number of participants who completed the program divided by the number of participants that started the program (7).’

**Statistical analysis**

Line 120: Add the words in italics to the following sentence – “..correlation between participation levels and the proportion of females participating..”

As this sentence did not seem to be clear to the reader as reviewer 2 mentioned, we changed this sentence from:

‘Pearson correlations were calculated in order to investigate the correlation between participation levels and proportion females participating, mean age of the participants, program duration, and group size.’

Into

‘Pearson correlations were calculated in order to investigate the correlation between participation levels and: gender distribution of the participants; mean age of the participants; program duration; and group size.’

**Results**

Line 126-127: Non-scientific language used – revise

We changed
‘The flowchart in figure 1 shows how we finally ended up with 17 studies that were included in the review. The studies were published between 2002 and 2013 since no studies prior to this time met the inclusion criteria.’

Into

‘Sixteen studies reporting on 17 PA programs, were included which were published between 2002 and 2013 since no studies prior to this time met the inclusion criteria (Figure 1).’

**Line 136-137: Unclear what is meant by this sentence**

In order to clarify this sentence, we changed ‘Three programs offered a walking group (14, 16, 26), seven programs offered multifaceted activities (12, 13, 16, 19, 21, 22, 28), and seven programs each had a different content (15, 16, 20, 23-25, 27).’

Into

‘Three programs involved group-walking (16, 20, 28), seven programs involved multifaceted activities such as a combination of education and a training program (14, 15, 18, 21, 23, 24), and seven programs involved various PA activities such as a pedometer intervention or different exercise programs (17, 19, 22, 25-27, 29) (Table 1).’

**Line 137-138: Non-scientific language used – revise**

We rephrased lines 136-138 and changed ‘Six programs were home-based (12, 14, 17-19, 22), 5 programs were group-based (20-21, 24-26), and six were both home- and group based (13, 15, 16, 23, 27, 28).’

Into

‘Program characteristics that showed the most variation were the location at which the program took place and the content of the program. Six programs were home-based (14, 16, 19-21, 24), five programs were group-based (22-23, 26-28), and six were both home- and group-based (15, 17, 18, 25, 29).’

**Discussion**

**Line 158 & 160: Change the word “seventeen” to its numeric – 17**

We changed ‘seventeen’ to its numeric.

**Line 158: Change from “at improving” to “to improve”**.

We changed ‘at improving’ to ‘to improve’.

**Line 172: What is meant by the use of “effective” in this sentence? Clarify.**

Thank you for addressing that this is not clearly defined.

We added to the method section:

‘An *effective* PA program was defined as a program for which a significant effect on at least one PA outcome was reported.’
The overall mean sustained participation level of almost 80% found in the current systematic review was higher than expected, as lower participation levels have been found among children (30,31), and for other types of health-behaviour programs for older adults (10). The mean sustained participation level of effective PA programs was lower than the overall mean. This could imply that the effective programs have a smaller overall population impact when implemented on a larger scale as compared to programs with smaller effects but higher sustained participation levels (11-13).

The mean initial participation level of 9.2% is difficult to interpret without additional information about the way of recruitment and effort or resources invested. For example 9.2% seems high when recruitment is done by putting up an advertisement in a community building, but low when mailing people personally and subsequently phoning them. Although for public health impact it is important to have insight in the number of older adults that would participate when providing a PA program
(32), for 12 PA programs important information was missing. This is striking since information on initial participation gives insight into potential selective participation and in the external validity of the results. Furthermore, in the recent CONSORT statement it was emphasized to include information on the eligible participants in order to increase validity (33). Thus, it is important that at least an indication of initial participation levels is reported when the effects of PA programs are studied. Although, none of the included PA programs in this current systematic review included online components, it is of interest to study the growing implementation of online PA programs (34) which potentially increase the ease of initial participation.’

**Conclusions**

Comment: Conclusions don’t address the “so-what” factor of this research. Why is this research important? What are some future directions?

This remark was also made by reviewer 2 and addressed in comment 18.