Author's response to reviews

Title: Cognitive intervention through a training program for picture-book reading in community-dwelling older adults: a randomized controlled trial

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Author's response to reviews: see over
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Editor-in-Chief, BMC Geriatrics

Dear Editor-in-Chief;

We greatly appreciate the careful review of our paper by the Journal. We have revised the paper according to the comments and suggestions made by reviewers, which contributed to a much improved paper. Please find below a point-by-point response to reviewers, as well as the revised manuscript attached.

Best regards,
Hiroyuki Suzuki, PhD

Reviewer 1
Major Compulsory Revisions:

Background,

【1】Pg. 3, line 23 & 24: “The increase in people....” This sentence states that cognitive decline in older adults is a public concern. You should expand on how cognitive decline affects economic costs. This section should sell your intervention, so use the literature to support why this is a problem

We revised as “As the total worldwide societal cost of dementia, based on a dementia population of 34.4 million persons with dementia, was estimated to $422 billion in 2009, including $142 billion for informal care (34%), the increase of people with cognitive decline causes huge economic and societal costs and becomes a burden to the community [1]”. (P3L17~L21 in the revised text)

【2】Pg. 4, line 3-10: (1) This section focuses on the benefits of physical exercise on cognitive functioning in older adults; however, there needs to be details of supporting literature that shows this. It is not enough to state facts. (2) Also, it seems as if you are assuming all older adults have difficulty with physical exercise, when in fact there are some older adults who exercise for their hobby (also consider group exercise which is common among older adults).
(1) We revised as “Previous randomized controlled trials of community-dwelling older adults have found that physical exercise programs contribute to improvement in cognitive functions [5, 6]. Aerobic exercise training is effective at reversing hippocampal volume loss in late adulthood, which is accompanied by improved memory function [5]. A 6-month program of physical activity provided a modest improvement in cognition over an 18-month follow-up period for adults with subjective memory impairment [6].” (P4 L2~L8 in the revised text)

On the other hand, we deleted “van Uffele (2008)” in the revised text because the article reported that the effect of the walking program was limited to memory in men and memory and attention in women with better adherence.

(2) We added “not a few” because the elderly do not always experience pain or suffering from injury, as the reviewer said. (P4 L11 in the revised text)

(3) Pg. 4, line 17: you mentioned lack of hippocampal activation but more information about this is needed for lay readers who may not understand what that means.

(3) We described as “In addition, age-related impairments of memory are thought to originate from the lack of hippocampal activation during memory encoding. When young people memorize novel information, cerebral blood flow of the hippocampus, a region of the brain that participates in memory, increases. On the other hand, when older adults do the same work, the cerebral blood flow of the hippocampus does not increase [10].” (P4 L20~L24 in the revised text)

(4) Pg. 5, line 13 & 14: Social Engagement Theory is an important concept here. Draw on existing literature to further explain how this relates to your intervention.

We developed the present program with reference to Experience Corps®[39]. Therefore, we revised as follows: Especially, initial findings of intergenerational volunteering suggest that a “real-world” intervention can be successful by integrating the individual effects of increased cognitive, social, and physical activity into daily life, thus allowing for large daily doses of stimulating activity [39]. (P15 L20~P15L24 in the revised text)

Measurements:

(5) Please state what the scores mean (e.g., fewer seconds on Trails B indicate better executive function). Also it would help to include test-retest reliability for each measure.

(5) We described what the scores mean of the Logical Memory, TMT, and Kana pick-out test. We explained test-retest reliability of the Japanese version of TMT-B. (P9L2, P9L14~L16 and P9L22 in the revised text)
[6] Pg. 9, line 12: This sentence needs revision because it seems as if the alternating pattern of numbers and letters measured time. It should be clear that this is a timed-task.

[6] We revised as “The participants were required to connect the numbers and letters alternately. Fewer seconds on TMT-A & B indicate better attention and executive function. The test-retest reliability for the Japanese version of TMT-B was 0.595 [24]” (P9L13~L16 in the revised text)

Results

[7] Pg. 11 line 5: the first part of the comma series “age, gender, education level” are characteristics of the two groups being compared, whereas the second part of the comma series list cognitive measures. Are you stating there were no differences in these scores? Please clarify.

[7] Yes, there were no differences in these scores. Therefore, we revised as “scores of MMSE, MoCA-J, GDS, and TMIG-IC at baseline”. (P11L5~L7 in the revised text)

Analysis,

[8] Pg. 11, line 18: “rate of retention” Please indicate if you are referring to the actual retention rate of the participants or memory recall.

[8] The actual retention rate of the participants was 100% without those who dropped out. We revised as “Mean ± standard deviations of the actual retention rate of the memory recall test were 62.7 ± 27.5% at pre-program and 74.0 ± 26.0% at post-program in the intervention group. Those of the control group were 58.8 ± 29.5% at pre-program and 56.7 ± 28.0% at post-program.” (P11L18~L21 in the revised text)

[9] Pg. 12, line 3 & 4: This is only one sentence, but it starts a new paragraph. Where are the remaining sentences to complete the paragraph?

[9] I am sorry that we do not separate the relevant paragraph. (P12L8~L9 in the revised text)

[10] Pg. 12, line 20-25: Trails A results were significant; therefore, there were cognitive improvements not only in the executive function domain but also attention.
The reviewer’s comment is absolutely right. We added the effect in the attention domain as follows: In MCI participants, the intervention effects were found both in executive function and attention tests. (P12L22~L23, P14L3~L4 and P17L6~L8 in the revised text)

Discussion

Pg.13, line 17: “naturally developed memorization strategies” How so? If it was a natural response, there would be no need for this intervention.

Thank you for the reviewer’s reasonable comment. We regarded “unconsciously” as suitable, compared to “naturally.” (P13L19 in the revised text)

Pg.14, line 11-13: Know that there are some situations in which cognitive function cannot be modified. It depends on neuroplasticity and cognitive reserve which can change across the lifespan. The key to preventing cognitive decline is to encourage older adults to engage in cognitively stimulating activities (e.g., learn a new skill). In line 13, “of” should be “in”

As the reviewer pointed out, there are some situations in which cognitive function cannot be modified. Therefore, we modestly revised the relevant sentence as follows: Based on neuroplasticity and cognitive reserve theory, cognitive abilities are expected to be modifiable at all stages of the life course [8]. The key to preventing cognitive decline may be to encourage older adults to engage in cognitively stimulating activities such as learning a new skill. Furthermore, long-term continuation of intellectual activities is also important to maintain cognitive functions. (P14L22~P15L2 in the revised text)

Pg. 15, line 13: Since the study was not conducted over an extended period of time, it is not safe to conclude the intervention contributed to the prevention of cognitive decline. This conclusion cannot be made without observing long-term effects of the intervention.

The reviewer’s comment is absolutely right. We revised as follows: These short-term findings suggest that this program contributed to prevent the decline in some domains of cognitive function. (P17L8~L9 in the revised text)
Minor Essential Revisions:

Abstract

[13] Pg. 2, line 11 & pg. 9, line 9: spell out the number if it starts a sentence

[13] Thank you for pointing out the basic mistakes. We corrected them. (P2L11 and P9L12 in the revised text)


[14] We revised as “In a post-test conducted one-year after baseline comparison” instead of “In one-year post-baseline comparison.” (P15L9~L10 in the revised text)

[15] Pg. 5, line 9 & 11: You use the terms “cognitive training” then “brain training.” Consider using one of these terms throughout the manuscript for consistency. Some areas you hyphenate picture-book and other areas you do not use the hyphen. So far, you have referred to your population of interest as elderly people, persons, older adults, and older people. There should be some consistency in this as well.

[15] According to the reviewer’s comment, we use one term throughout the manuscript for consistency: “cognitive training”, “picture book” and “older adults”

[16] Pg 5, line 25: How does the intervention influence instrumental activities of daily living? Expand on this.

[16] As both the intervention group and the control group were independent in IADL (instrumental activities of daily living) at baseline (Table 1), we cannot find significant change in IADL during the short period observed in this study. Therefore, we do not focus on effects on IADL.

[17] Pg. 6, 10-12: Avoid using 1st or 2nd person

[17] We had a criterion on self-reported memory problem because we wanted to get rid of being occupied with only extensively healthy participants with intellectual curiosity. As criterion (ii): memory complaint of this study does not mean subjective or objective serious symptom, but means “being worried about memory problems”. We revised as “worried about memory problems.” Participants of this study were all age 65 years and older and were worried about memory problems. (P6L5~L9 in the revised text)
“applied” sounds like there was an application process

We apologize for confusing you. The 68 persons were not eligible for the intervention program but participants in initial screening examination. We revised the relevant sentence as “Sixty-eight applicants participated in the initial screening examination.” We thoroughly revised the paragraph of the screening process relevant to the reviewer’s comments [19] and [23]. (P6L8 in the revised text)

Exclusion criteria – What about other neurological impairments (e.g., mental retardation)?

First of all, we apologize that screening process of this study was not clear. We revised the process in detail in the section of “Study Design and Participants” and “Figure 1”. We revised as “No applicant had other neurological impairments including mental retardation”. (P6L12~L13 in the revised text) (Revised Figure 1)

Procedure, Pg. 7, line 5: It should read 12-week.

We revised as 12-week. (P7L6 in the revised text)

Avoid using adjectives such as good to describe cognitive influence. Also, “to” should be “on”

We revised as “Learning new skills had good influence on the memory function”. (P13L15 in the revised text)

“obtained” should be “observed”

We revised as “observed” instead of “obtained”. (P14L14 in the revised text)

If the diagnosis of dementia was self-reported, that is another limitation to consider.

Participants were screened and diagnosed by a geriatrician who is specialized in dementia. I am sorry that we did not describe the process in detail. We revised “the Study Design and participants” according to the comments [18] and [19]. Therefore, we do not think it necessary to add another limitation concerning diagnosis of dementia. (P6L3~P6L14 in the revised text)
Reviewer 2

Major points:

【24】1. Abstract is redundant.

【24】We revised Abstract briefly. (P2L3~P3L7 in the revised text)

【25】2. Background P3L20#"the prevalence of senile dementia in the 2000s tended to be falling as compared with that of the 1980s" This sentence is misleading. The cited report showed decreased age-adjusted prevalence, but not prevalence. Indeed, prevalence increased in 2000s. The author should describe that this reduction of age-adjusted prevalence dues to prevention program.

【26】3. P4L1: “Non-pharmacological interventions are an important strategy for overcoming such a rapidly aging society” Is it possible to overcome aging society? To overcome aging society, average life span should be shorten, which is impossible.

According to the reviewer’s comments【25】and【26】，we revised and partially relocated the relevant paragraphs as follows: Dementia is a topic of international concern, with rapid increase in the number of older adults with dementia in many countries. As the total worldwide societal cost of dementia, based on a dementia population of 34.4 million persons with dementia, was estimated to $422 billion in 2009, including $142 billion for informal care (34%), the increase of people with cognitive decline causes huge economic and societal costs and becomes a burden to the community [1]. On the other hand, recent studies reported that the age-adjusted prevalence of senile dementia in the 2000s tended to be falling as compared with that of the 1980s [2, 3]. Non-pharmacological interventions are expected to be an important strategy for reducing age-adjusted prevalence of senile dementia, considering that complete medical treatment for cognitive decline has not yet been developed [4]. (P3L16~P4L2 in the revised text)

【27】4. P4L9: “For elderly people” should be “For mentally-normal elderly people”.

【27】We revised as “For mentally-normal older adults”. (P4L12 in the revised text)

【28】5. P4L22#P5L14#This part should be discussed in Discussion session. This part makes Background session redundant.

According to the reviewer’s comment, we relocated as follows: P15L3~L24 in the revised text.
6. P7L5: Add how many times lecture was done for the control group.

The lecture was provided 3 times for the control group. (P7L5~L6 in the revised text)

7. P7L7: “each group” should be “both groups”.

We revised as “both groups”. (P7L7 in the revised text)

8. P8L22: “the participants are asked to recall the contents of a story immediately after examiner tell the two stories” This is a wrong method, where examiner tells 2 stories, and then participant recalls 2 stories. In a right way, examiner tells one story and participant recalls the story, then examiner tells the next story. This is a critical point. If the method was wrong, this paper should be rejected.

The reviewer is correct that the original wording does not accurately reflect the procedure. We revised as “In this test, the examiner tells the first story and participants are asked to recall the contents of the story immediately. Then the examiner tells the second story and participants recall the story”. (P8L21~L23 in the revised text)

9. P12L10

#1) Definition of MCI appears here first. It should be described in Method session.

2) The authors used the score of MoCA-J to detect MCI. This method is somewhat troublesome. The reason why they used this standard to define MCI should be described in the Discussion session.

#1) According to the reviewer’s comments, we relocated the relevant paragraph to Method session. (P10L9~L10 in the revised text)

#2) As the reviewer pointed out that it was somewhat troublesome to detect MCI using MoCA-J in the present study. However, well-trained psychologists can objectively detect MCI for collecting much more data or long-term data in the near future even if a physician cannot accompany them. So using MoCA-J is, in a sense, practical, we think. (P16L12~P16L16 in the revised text)

10. P13L19-20: “Repeating these activities might positively influence acquisition of memorization strategies for the participants” Please cite reference for this part, if possible.
I am very sorry for citing no reference article. Therefore, we toned down the sentence as follows: We speculated that repeating these activities might positively influence acquisition of memorization strategies for the participants. (P13L23~P14L2 in the revised text)

11. Fig 2 is incomplete. I recommend to make new table with format of the Table2 to show the result of MCI participants, instead of Fig.2. If the authors want to use Fig 2, number of subjects and p value should be added in the figure.

We revised Fig 2 including number of subjects and p values. (Revised Figure 2)

The authors should consider why there was no intervention effect in other cognitive tests such as MMSE, MoCA-J, Logical Memory I, TMT, Kanapick-out test, etc in the discussion.

We described the reason which had no intervention effects in other cognitive tests such as LM, DSF, DSB, MoCA-J, and executive function tests in the discussion. (P13L19~L22, P14L7~L13 in the revised text)

The hypothesis that delayed verbal memory might be improved by picture-book reading should be written in background.

We described the hypothesis in the background. (P5L17~L18 in the revised text)

It is necessary to mark the places where there is a significant difference in Figure 2.

We indicated P value at the place which had a significant difference in Fig. 2. (Revised Figure 2)
We hope that this revised manuscript is acceptable for publication in the *BMC Geriatrics*.

With best regards,

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