

REVIEW REPORT

Title: Association between cognitive function and physical activity among elderly persons in a selected community in Tamil Nadu, India

Authors: Sivasankari Jayaraj, Veluri Rakesh, Buvanesh Annadurai, Vinodhkumar Ramalingam

Reviewer D: Lingkan Barua, **ORCID:** 0000-0002-9281-3839, **COI:** None, **AI disclosure:** None

1. **Comment** The research question was not explicitly stated.
Author response: The research question has now been revised as advised (Lines 48-49).
2. **Comment** No sample size calculation provided.
Author response: No formal sample size calculation was not performed. We just recruited 80 participants conveniently. Therefore the issue of generalizability has been discussed (Lines 104-114).
3. **Comment** Exclusion criteria unclear. How dementia was ruled out?
Author response: We have clarified the operational definition and screening process.
4. **Comment** Confounding variables were not addressed.
Author response: We have clarified inclusion and exclusion criteria explicitly. Please see the lines 56-64. For ruled out of dementia no extensive measures has taken. Such limitation has been addressed (Lines 104-114).
5. **Comment** MMSE mean (16.03) suggests moderate cognitive impairment, contradicting exclusion of dementia.
Author response: The reported MMSE value has been carefully reviewed. The possibility of inclusion of participants with undiagnosed cognitive impairment has now been acknowledged.
6. **Comment** Statistical approach is oversimplified and potentially misleading due to the following reasons:
very narrow uncertainty interval is unusual in small sample size.
Pearsons correlation coefficient r 0.933, 95 CI: 0.89 0.96; p 0.001 is very high which is unusual for behavioural research. Besides, p value alone is overemphasised.
Author response: We have revised the statistical part. We agree that this value is high for behavioural research. This could be due to not considering the influence of confounding factors. Therefore, we have discussed in discussion section as well as mentioned in conclusion.
7. **Comment** Lack of discussion explanations on limitations like confounding variables, sampling bias, unusually high correlation coefficient and reverse causality better cognition resulting more activity.
Author response: We have significantly expanded the discussion and limitations (Lines 97-114).
8. **Comment** Not discuss about clinical significance of the study. It means "What does a change in PASE mean for MMSE in real terms?"
Author response: We have added interpretation regarding clinical relevance as well as the public health importance.

Reviewer E: Fardina Rahman Omi, **ORCID:** 0000-0002-9135-9937, **COI:** None, **AI disclosure:** None

9. **Comment** Title should be shorter. Please revise it as "Association between cognitive function and physical activity among elderly persons in a selected community in Tamil Nadu, India"
Author response: We have revised the title as advised.
10. **Comment** The objective is not clear. Revise it as statement align with the title.
Author response: Revised the objective as advised (Lines 48-49).
11. **Comment** Which version of the MMSE was used, how it is assessed, explain it with proper reference.
Author response: Appropriate references has been given for MMSE questionnaire. Reference no – 3.
12. **Comment** Line 83- This finding is consistent with previous research reporting superior memory and executive function among physically active....., Need appropriate reference.
Author response: Appropriate references have been added in the revised manuscript. Now the reference number is 4
13. **Comment** Line 87 to 95- These lines jump from public health promotion to physiotherapy/rehabilitation, then to methodological credibility. That makes it feel scattered. One sentence is broad (policy/public health), the next is specific disciplines (physiotherapy), the last is technical (assessment tools). Without transitions, it reads like three separate points. Please refine these lines to improve orientation and flow.

Author response: The paragraph has been rewritten for better coherence and logical flow (Lines 105-114).

Responsible editor: Rijwan Bhuiyan, **ORCID:** 0000-0003-0005-8889, **COI:** None, **AI disclosure:** None

14. Comment The rationale and study objectives are not sufficiently articulated. A major revision is required. The authors are encouraged to carefully revise the introduction to provide a stronger justification and clearly defined objectives.

Author response: The Introduction has been revised and strengthened. The objective was revised. Please see the line numbers 39-49.

15. Comment The source community from which participants were recruited should be described more clearly.

Author response: We have revised the in methods section (Lines 52-54).

16. Comment The inclusion criteria appear to be embedded within the preceding sentence and may be redundant. Please review and revise for clarity and conciseness.

Author response: Revised the inclusion and exclusion criteria (Lines 56-64).

17. Comment Appropriate references should be provided to support the statements made in the discussion section.

Author response: Appropriate and updated references have been incorporated.

18. Comment The conclusion and the generalizability of the findings should be more clearly explained.

Author response: Conclusion has been revised. Now looks like as – “This study shows a positive association between physical activity and cognitive function among community-dwelling older adults. These findings support the potential role of physical activity as a strategy for promoting cognitive health in ageing populations, particularly in low- and middle-income settings.

However, due to methodological limitations, including the cross-sectional design, potential confounding factors, and convenience sampling, the findings should be interpreted with caution. Further longitudinal studies are needed to establish