

RESEARCH LETTER

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



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As the global population ages, cognitive impairment has become a major public health concern, particularly in low- and middle-income countries such as India [1]. Regular physical activity is considered a modifiable factor that may help preserve cognitive function through improved cerebral blood flow, enhanced neuroplasticity, and reduced cardiovascular risk [2]. However, community-based evidence examining this relationship among elderly persons in Southern India remains limited. This study aimed to assess the association between physical activity and cognitive function among elderly persons in a selected community in Tamil Nadu, India.

A cross-sectional study was done among conveniently selected persons aged 60 years and above residing in a selected community in Tamil Nadu, India. Individuals who could communicate effectively and perform basic activities of daily living independently were included. Participants with previously diagnosed dementia, severe neurological disorders such as stroke or Parkinson's disease, major psychiatric illness, severe visual or hearing impairment, or inability to complete the assessments were excluded. Cognitive function and physical activity were assessed using the Mini-Mental State Examination (MMSE) [3], and Physical Activity Scale for the Elderly (PASE) [4] respectively. The MMSE was used only as a screening tool, with no formal diagnostic evaluation performed. Trained physiotherapists conducted all assessments at the community level. Descriptive statistics were used to summaries participant characteristics, and the

association between physical activity and cognitive function was examined using Pearson's correlation coefficient.

Eighty community-dwelling elder persons were analysed, of whom 56% were women. The mean (standard deviation) age was 71.2 (6.5) years. The mean (standard deviation) of PASE and MMSE scores were 309.5 (182.8) and 16.0 (3.9), respectively. Pearson's correlation analysis demonstrated a strong positive correlation between physical activity and cognitive function ($r=0.93$, 95% confidence interval: 0.89–0.96; $P<0.001$) (Figure 1).

The study's findings align with a large study based on Longitudinal Ageing Study in India data showed that frequent physical activity was associated with significantly higher cognitive scores, independent of major confounders [5]. Systematic reviews and meta-analyses have similarly reported a positive relationship between physical activity and better cognitive performance, including reduced risk of cognitive decline [6, 7]. The mean MMSE score of 16.0 observed in this sample indicates a high burden of cognitive impairment and is consistent with other community-based studies in India, where lower scores are commonly influenced by education, socioeconomic status, and rural residence [8]. The PASE scores reflect typical moderate activity levels among older Indian adults, mainly involving household and occupational tasks.

The study has several limitations. The cross-sectional design of this study precludes causal inference, and the possibility of residual confounding

Key messages

This study demonstrates a strong positive association between physical activity and cognitive function among elderly persons in a community in Tamil Nadu, India. The findings highlight the potential of promoting simple and culturally appropriate physical activities as a low-cost approach to support cognitive health in resource-limited settings.

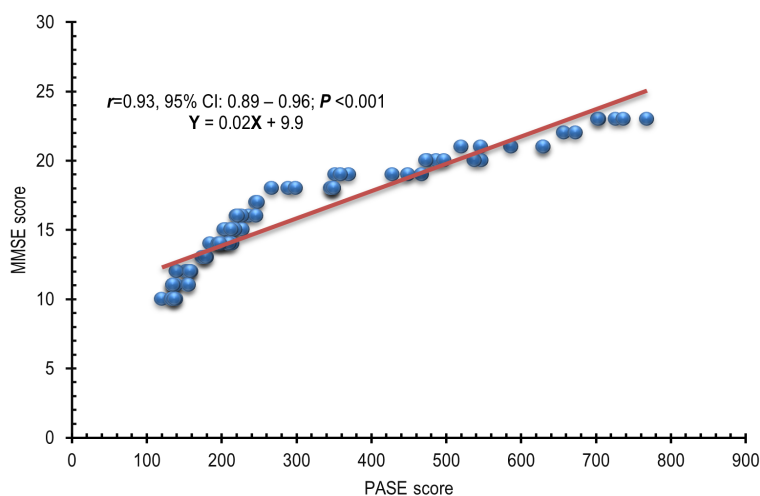


Figure 1 Association of Mini-Mental State Examination (MMSE) scores with Physical Activity Scale for the Elderly (PASE) scores

cannot be ruled out in correlation analysis. Convenience sampling from a single community limits generalization as well. Moreover, the MMSE has known limitations in populations with low education levels, and self-reported physical activity data are subject to recall bias. No comprehensive neuropsychological assessment or clinical diagnosis was conducted. Despite these limitations, the results suggest that promoting culturally appropriate and low-cost physical activities such as walking and yoga may serve as a feasible strategy to support cognitive health in resource-constrained settings like India. Longitudinal and interventional studies are needed to establish causality and evaluate targeted interventions in similar South Indian communities.

In conclusion, this study supports that greater physical activity is strongly associated with better cognitive function among older persons in Tamil Nadu.

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Author contributions

Conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: SJ, VR, BA, VR. *Drafting the work or reviewing it critically for important intellectual content:* SJ, VR, BA, VR. *Final approval of the version to be published:* SJ, VR, BA, VR. *Accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved:* SJ, VR, BA, VR.

Conflict of interest

We do not have any conflict of interest.

Data availability statement

We confirm that the data supporting the findings of the study will be shared upon reasonable request.

AI disclosure

The authors declare that artificial intelligence was used to assist with language editing, improving clarity, and restructuring the manuscript. All content was critically reviewed and approved by the authors, who take full responsibility for the final version.

Supplementary file

None

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