

Understanding the Role of Health Education in Promoting Strengthening Exercises Among the Elderly: A Comprehensive Literature Review

Sona James*, Jeffery Samuel

Department of Physiotherapy St John's Physiotherapy College, Bangalore, India.

*Email: sonajames2003@gmail.com

Abstract

The purpose of this systematic review was to assess how health education impacts awareness and exercise participation in improving exercise among older adults. Systematic searching was performed in PubMed (2017–2025) with pre-specified keywords, and peer-reviewed quantitative and qualitative papers including adults ≥ 60 years were considered; 12 studies meeting the methodological quality standards were assessed. There is evidence that health education interventions, particularly when integrated with multi-component or resistance exercise programs, enhance muscle strength, mobility, balance, fall prevention, and prevention of sarcopenia. Even though considerable evidence exists supporting these effects, strengthening exercise participation is low because of misconceptions regarding ageing, fear of injury, and lack of access to structured programs, particularly in rural and low-income areas. The review concludes that physiotherapist-facilitated health education and community-based interventions can increase awareness, exercise compliance, and functional independence of older individuals. These results underscore the importance of policymakers and public health systems incorporating accessible strength-training programs within standard care for the elderly to ensure healthy ageing.

Keywords

Health Education, Strengthening Exercises, Elderly / Older Adults, Physical Activity, Sarcopenia Prevention

Introduction

With a rapidly aging global population, maintaining health, independence, and functional ability in older adults has become a major public health priority. Increasing life expectancy is associated with a higher prevalence of chronic diseases, functional decline, and age-related muscle loss or sarcopenia, which contributes to reduced mobility, increased fall risk, dependency, and diminished quality of life (Shaikh et al., 2020; Kim, H. et al., 2016). Ageing induces multisystem physiological changes such as reduced muscle fiber size, impaired neuromuscular activation, and decreased endurance that collectively accelerate frailty and disability (Dhillon et al., 2017). However,

Submission: 6 October 2025; **Acceptance:** 6 November 2025; **Available online:** November 2025



Copyright: © 2025. All the authors listed in this paper. The distribution, reproduction, and any other usage of the content of this paper is permitted, with credit given to all the author(s) and copyright owner(s) in accordance to common academic practice. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license, as stated in the web [site: https://creativecommons.org/licenses/by/4.0/](https://creativecommons.org/licenses/by/4.0/)

research consistently demonstrates that strengthening and resistance exercises can counteract these age-associated declines. Studies report improvements in muscle strength, balance, and mobility and even pain reduction in conditions such as osteoarthritis and chronic low back pain when progressive resistance training is appropriately prescribed (Hunter et al., 2004; Fragala et al., 2019; Ishak et al., 2017; Pelland et al., 2004). Comprehensive programs that combine strength training with balance, flexibility, and aerobic activity can delay disability and enhance functional outcomes (Latham et al., 2003), while newer evidence suggests that pairing resistance training with protein supplementation further enhances mobility and muscle mass (Liao et al., 2017).

Despite strong clinical evidence, participation in strengthening exercises among older adults remains low. Fear of injury, lack of knowledge, poor motivation, limited access to supervised programs, and persistent myths about ageing impede adherence. Epidemiological studies across the world report a significant prevalence of sarcopenia, especially in resource-poor settings: 14.2% in rural South India (Shaikh et al., 2020) and 12.6-17.5% worldwide, largely attributed to physical inactivity and insufficient muscle-strengthening activity (Kim, H. et al., 2016). Previous reviews have focused on the benefits of resistance training but have not explored how health education influences awareness, motivation, and adoption of strengthening exercises among older adults. The behavioural and educational dimension is addressed rather inadequately. Health education, particularly provided by a physiotherapist or community health worker, holds the promise of clearing misconceptions, instilling confidence, and guiding safe exercise participation. Less is known about how varying education strategies impact exercise uptake and adherence in older adults.

Therefore, this review seeks to synthesise recent evidence on the role of health education in promoting strength training among older adults and to fill the gap in understanding how education influences awareness, behaviour change, and long-term engagement in strength training.

Methodology

This study employed comprehensive literature review design. A systematic web-based search was conducted to identify research examining the role of health education in promoting strengthening exercises among older adults. Searches were performed across multiple electronic databases—PubMed, Google Scholar, Scopus, Web of Science, and CINAHL—for studies published between 2017 and 2025. Boolean operators (“AND,” “OR”) were used to combine relevant keywords and MeSH terms, including health education, strengthening exercises, resistance training, older adults/elderly, and sarcopenia prevention. The search strategy involved title and abstract screening, followed by full-text evaluation using predefined inclusion and exclusion criteria. Eligible studies included Randomized Controlled Trials, systematic reviews, and meta-analyses involving individuals aged ≥ 60 years and examining the effect of health education on strengthening exercise awareness, adherence, or outcomes. Non-English studies, articles without full-text access, those unrelated to health education’s impact on strengthening exercise behaviour, duplicates, and low-quality studies (score $< 50\%$ on critical appraisal tools) were excluded. Methodological quality was assessed using the PEDro scale for RCTs, CASP checklists for systematic reviews and qualitative studies, and JBI critical appraisal tools for mixed designs. Additional manual screening of reference lists was conducted to identify studies not captured in database searches. All records

were organized using reference management software. The study selection process and exclusion rationale are documented through a PRISMA flow diagram to ensure transparency.

Inclusion Criteria:

- i. Articles published in English
- ii. Publication window: 2017 to 2025
- iii. Study types: Randomized Controlled Trials, Systematic Reviews, and Meta-Analyses
- iv. Population: Geriatric individuals (aged 60 and above)
- v. Focus: Studies evaluating the role of health education in promoting awareness or adoption of strengthening exercises

Exclusion Criteria:

- i. Articles not available in full text online
- ii. Non-English publications
- iii. Studies not directly addressing the influence of health education on strengthening exercise behaviour in the elderly
- iv. Duplicate publications or studies with low methodological quality (<50% on appraisal tools)

Literature reviews are summarized in detail in **Table 1**.

Table 1. Review of Literature

Study	Objective	Methods	Key Findings	Critical Review
1. Yamamoto et al. (2020)	Evaluate a combined exercise + education program on function and social engagement.	5-week community-based RCT, 42 participants >65 (11 dropouts).	Improved 30-s chair stand and TUG ($p < .001$); increased social engagement ($p = .022$).	Short duration; social gains not maintained at follow-up.
2. Bårdstu et al. (2020)	Test home-care resistance training effects on function.	Cluster RCT in older adults receiving home care.	Significant gains in walking speed, chair rise, and stair climb.	High dropout; no change in body composition.
3. Samal & Manchana (2025)	Evaluate HAAEP program combining exercise and health education.	RCT in rural Indian elderly (n=270), 16-week intervention.	Enhanced strength, flexibility, balance; high engagement via booklets, sessions, WhatsApp.	Non-blinded; potential contamination between groups.
4. Chen et al. (2025)	Assess resistance training in sarcopenic elders.	Systematic review & meta-analysis of RCTs.	Improved muscle mass, strength, and performance.	High heterogeneity; interventions <36 weeks.

5. Hart et al. (2019)	Analyze RT impact on quality of life.	Systematic review/meta-analysis (2008-2017).	Large effects on bodily pain (ES=0.81) and mental health (ES=0.64).	Moderate study quality; SF-36 only.
6. Solis-Navarro, L. et al. (2022)	Review home-based structured exercise + education.	Systematic review.	Positive outcomes in function, self-care, knowledge; education essential.	No meta-analysis; use of generic QoL tools.
7.Chen et al. (2023)	Investigate community exergames with education.	Cluster RCT in care-home residents.	Reduced falls; improved strength and social engagement.	Tech literacy and cost may limit scalability.
8. Wing et al. (2025)	Test virtual group exercise + education.	Pilot RCT, 37 older adults.	Physical and social well-being improved; adherence equal in lower-fit participants.	Small sample; short-term, virtual feasibility only.
9. Burton, E. et. al (2025)	Evaluate peer support + RT adherence.	6-week pilot, peer vs gym RT.	Peer-supported group completed more sessions; similar functional gains.	Small pilot; short duration.
10. Adekpedjou, R. et.al(2023)	Aggregate non-pharma frailty interventions.	Overview of systematic reviews.	RT $\geq 2x/week$ reversed/prevented frailty, esp. with nutrition.	Limited stratification; need validated frailty tools.
11. Lim, H et.al (2024)	Examine community exercise in pre-frailty.	Systematic review + meta-analysis.	Improved lower limb strength and gait; tripled odds reversing pre-frailty.	Variation in session frequency; unclear optimal dose.
12. Evan V Papa et.al (2017)	Assess the effect of resistance training on physical function in older adults with muscle deficits.	Systematic Review and Meta-Analysis (PRISMA) statement	Improved functional mobility and stability in older adults with muscle function deficits.	Limited by small samples, varied methods, and low generalizability.

Results and Discussion

The findings of this review indicate that although strengthening and resistance exercises are proven to increase muscle strength, balance, mobility and reduce fall risk in older adults, exercise participation remains limited unless supported by structured health education, making education a critical determinant of uptake and adherence rather than an optional component. The synthesis of studies reveals three key themes: first, education improves participation by correcting misconceptions about aging and reducing fear of injury, thereby increasing confidence and willingness to engage in strengthening activities; second, tailoring educational content to cultural and literacy levels—especially in rural and low-resource settings—improves accessibility and reduces inequities in participation; and third, programs that combine resistance training with education consistently show superior outcomes compared to exercise alone, particularly when delivered with progressive guidance, visual aids, group sessions, or peer/social reinforcement. Emerging models such as home-based programs, digital support tools, and physiotherapist-led community education demonstrate that consistent engagement depends not only on exercise prescription but also on continued motivation and behavior reinforcement. However, gaps remain—most studies were short term, educational components were not always well described, and long-term adherence and cost-effectiveness were rarely measured. Overall, the review highlights that to translate the well-established physical benefits of strengthening exercises into sustained behavioral change, programs must view strengthening not merely as a physical intervention but as a behavior change process driven by targeted, accessible, and ongoing health education.

Conclusion

Resistance training is a crucial strategy for healthy aging, improving muscle mass, strength, balance, and functional capacity, but older adult participation remains low due to limited awareness, misconceptions, and lack of structured guidance. There is evidence that the addition of resistance training to health education significantly improves adherence, reduces the risk of falls, and maintains functional independence, particularly in community settings. Empowerment of the elderly through accessible educational strategies by healthcare providers, physiotherapists, digital platforms, or community programs can bridge the knowledge gap and reduce disparities in exercise participation. In order to further enhance the impact of such initiatives, future intervention models should aim at the inclusion of resistance-training education within public health campaigns, routine geriatric care, and rehabilitation services. Further research is needed regarding digital health tools, personalized exercise counselling, and long-term follow-up strategies to determine the most effective strategies for maintaining exercise adherence. A coordinated, multidisciplinary approach has the potential to promote active, independent aging and improve quality of life among older adults.

Acknowledgements

The authors offer sincere thanks to researchers, clinicians, and public health practitioners whose efforts have contributed significantly to the knowledge base in geriatric health education and

exercise interventions. In addition, we offer sincere appreciation to mentors, peers, and allied institutions for their time and support during the course of this review's preparation. We also appreciate the consistent efforts of physiotherapists, educators, and caregivers who give empowerment to the older generation through evidence-based strengthening and health-promotion programs.

References

- Adekpedjou, R., Léon, P., Dewidar, O., Al-Zubaidi, A., Jbilou, J., Kaczorowski, J., Muscedere, J., Hirdes, J., Heckman, G., Girard, M., & Hébert, P. C. (2023). Effectiveness of interventions to address different types of vulnerabilities in community-dwelling older adults: An umbrella review. *Campbell Systematic Reviews*, 19(2), e1323. <https://doi.org/10.1002/cl2.1323>
- Bårdstu, H. B., Andersen, V., Fimland, M. S., Aasdahl, L., Raastad, T., Cumming, K. T., & Sæterbakken, A. H. (2020). Effectiveness of a resistance training program on physical function, muscle strength, and body composition in community-dwelling older adults receiving home care: A cluster-randomized controlled trial. *European Review of Aging and Physical Activity*, 17, 11. <https://doi.org/10.1186/s11556-020-00243-9>
- Burton, E., Hill, K. D., Codde, J., Jacques, A., Ng, Y. L., & Hill, A. M. (2023). Encouraging adults aged 65 and over to participate in resistance training by linking them with a peer: A pilot study. *International Journal of Environmental Research and Public Health*, 20(4), 3248. <https://doi.org/10.3390/ijerph20043248>
- Chen, S. R., Chen, M. C., Hou, W. H., & Lin, P. C. (2025). Effects of resistance exercise in older adults with sarcopenic obesity: A systematic review and meta-analysis. *The Journal of Nursing Research*, 33(4), e406. <https://doi.org/10.1097/jnr.0000000000000685>
- Chen, X., Wu, L., Feng, H., Ning, H., Wu, S., Hu, M., Jiang, D., Chen, Y., Jiang, Y., & Liu, X. (2023). Comparison of exergames versus conventional exercises on the health benefits of older adults: Systematic review with meta-analysis of randomized controlled trials. *JMIR Serious Games*, 11, e42374. <https://doi.org/10.2196/42374>
- Dhillon, R. J., & Hasni, S. (2017). Pathogenesis and management of sarcopenia. *Clinics in Geriatric Medicine*, 33(1), 17–26. <https://doi.org/10.1016/j.cger.2016.08.002>
- Fragala, M. S., Cadore, E. L., Dorgo, S., Izquierdo, M., Kraemer, W. J., Peterson, M. D., & Ryan, E. D. (2019). Resistance training for older adults: Position statement from the National Strength and Conditioning Association. *Journal of Strength and Conditioning Research*, 33(8), 2019–2052. <https://doi.org/10.1519/JSC.00000000000003230>
- Hart, P. D., & Buck, D. J. (2019). The effect of resistance training on health-related quality of life in older adults: Systematic review and meta-analysis. *Health Promotion Perspectives*, 9(1), 1–12. <https://doi.org/10.15171/hpp.2019.01>
- Huang, Z., Xu, T., Huang, Y., Zhao, Q., Dong, W., Xu, J., Liu, X., Fu, Y., Wang, Y., & Chen, C. (2024). Types of home and community-based physical activity and their effects on the older adults' quality of life: A systematic review and meta-analysis. *Journal of Applied Gerontology*, 43(12), 1950–1967. <https://doi.org/10.1177/07334648241257799>
- Hunter, G. R., McCarthy, J. P., & Bamman, M. M. (2004). Effects of resistance training on older adults. *Sports Medicine*, 34(5), 329–348. <https://doi.org/10.2165/00007256-200434050-00005>

- Ishak, N. A., Zahari, Z., & Justine, M. (2017). Kinesiophobia, pain, muscle functions, and functional performances among older persons with low back pain. *Pain Research and Treatment*, 2017, 3489617. <https://doi.org/10.1155/2017/3489617>
- Kim, H., Hirano, H., Edahiro, A., Ohara, Y., Watanabe, Y., Kojima, N., Kim, M., Hosoi, E., Yoshida, Y., Yoshida, H., & Shinkai, S. (2016). Sarcopenia: Prevalence and associated factors based on different suggested definitions in community-dwelling older adults. *Geriatrics & Gerontology International*, 16(Suppl. 1), 110–122. <https://doi.org/10.1111/ggi.12723>
- Latham, N. K., Anderson, C. S., Lee, A., Bennett, D. A., Moseley, A., Cameron, I. D., & Fitness Collaborative Group. (2003). A randomized, controlled trial of quadriceps resistance exercise and vitamin D in frail older people: The Frailty Interventions Trial in Elderly Subjects (FITNESS). *Journal of the American Geriatrics Society*, 51(3), 291–299. <https://doi.org/10.1046/j.1532-5415.2003.51101.x>
- Liao, C. D., Tsauo, J. Y., Wu, Y. T., Cheng, C. P., Chen, H. C., Huang, Y. C., Chen, H. C., & Liou, T. H. (2017). Effects of protein supplementation combined with resistance exercise on body composition and physical function in older adults: A systematic review and meta-analysis. *The American Journal of Clinical Nutrition*, 106(4), 1078–1091. <https://doi.org/10.3945/ajcn.116.143594>
- Lim, H., Jani, N. D. B., Pang, W. T., & Lim, E. C. W. (2024). Community-based exercises improve health status in pre-frail older adults: A systematic review with meta-analysis. *BMC Geriatrics*, 24(1), 589. <https://doi.org/10.1186/s12877-024-05150-7>
- Marcos-Pardo, P. J., Espeso-García, A., Vaquero-Cristóbal, R., Abelleira-Lamela, T., & González-Gálvez, N. (2024). The effect of resistance training with outdoor fitness equipment on the body composition, physical fitness, and physical health of middle-aged and older adults: A randomized controlled trial. *Healthcare*, 12(7), 726. <https://doi.org/10.3390/healthcare12070726>
- Papa, E. V., Dong, X., & Hassan, M. (2017). Resistance training for activity limitations in older adults with skeletal muscle function deficits: A systematic review. *Clinical Interventions in Aging*, 12, 955–961. <https://doi.org/10.2147/CIA.S104674>
- Pelland, L., Brosseau, L., Wells, G., MacLeay, L., Lambert, J., Lamothe, C., & Tugwell, P. (2004). Efficacy of strengthening exercises for osteoarthritis (Part I): A meta-analysis. *Physical Therapy Reviews*, 9(2), 77–108. <https://doi.org/10.1179/108331904225005052>
- Samal, A., & Manchana, V. (2025). Healthy and active aging exercise program for functional health and wellbeing among rural adults: Implementation and evaluation at primary care in Telangana. *Journal of Education and Health Promotion*, 14, 98. https://doi.org/10.4103/jehp.jehp_1467_24
- Šarabon, N., & Kozinc, Ž. (2020). Effects of resistance exercise on balance ability: Systematic review and meta-analysis of randomized controlled trials. *Life*, 10(11), 284. <https://doi.org/10.3390/life10110284>
- Shaikh, N., Harshitha, R., & Bhargava, M. (2020). Prevalence of sarcopenia in an elderly population in rural South India: A cross-sectional study. *F1000Research*, 9, 175. <https://doi.org/10.12688/f1000research.22580.1>
- Sherrington, C., Fairhall, N., Kwok, W., Wallbank, G., Tiedemann, A., Michaleff, Z. A., Ng, C. A. C. M., & Bauman, A. (2020). Evidence on physical activity and falls prevention for people aged 65+ years: Systematic review to inform the WHO guidelines on physical activity

- and sedentary behaviour. *The International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 144. <https://doi.org/10.1186/s12966-020-01041-3>
- Solis-Navarro, L., Gismero, A., Fernández-Jané, C., Torres-Castro, R., Solá-Madurell, M., Bergé, C., Pérez, L. M., Ars, J., Martín-Borràs, C., Vilaró, J., & Sitjà-Rabert, M. (2022). Effectiveness of home-based exercise delivered by digital health in older adults: A systematic review and meta-analysis. *Age and Ageing*, 51(11), afac243. <https://doi.org/10.1093/ageing/afac243>
- Wing, D., Nichols, J. F., Parra, M. T., Barkai, H. S., & Moran, R. J. (2025). Digitally delivered, group-based exercise interventions for older adults: Scoping review. *Journal of Medical Internet Research*, 27, e73578. <https://doi.org/10.2196/73578>
- Yamamoto, S., Ishii, D., Noguchi, A., Tanamachi, K., Okamoto, Y., Takasaki, Y., Miyata, K., Fujita, Y., Kishimoto, H., Hotta, K., Iwai, K., & Kohno, Y. (2020). A short-duration combined exercise and education program to improve physical function and social engagement in community-dwelling elderly adults. *International Quarterly of Community Health Education*, 40(4), 281–287. <https://doi.org/10.1177/0272684X19896732>