

Effectiveness of home-based exercise programs in children with acute lymphoblastic leukemia: A systematic review

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1 Introduction

- Children with acute lymphoblastic leukemia (ALL) often experience reduced physical fitness and functional capacity¹
- Exercise is a key component of supportive cancer care, improving physical outcomes²
- Home-based exercise programs may offer accessible and feasible rehabilitation for pediatric patients³

AIM

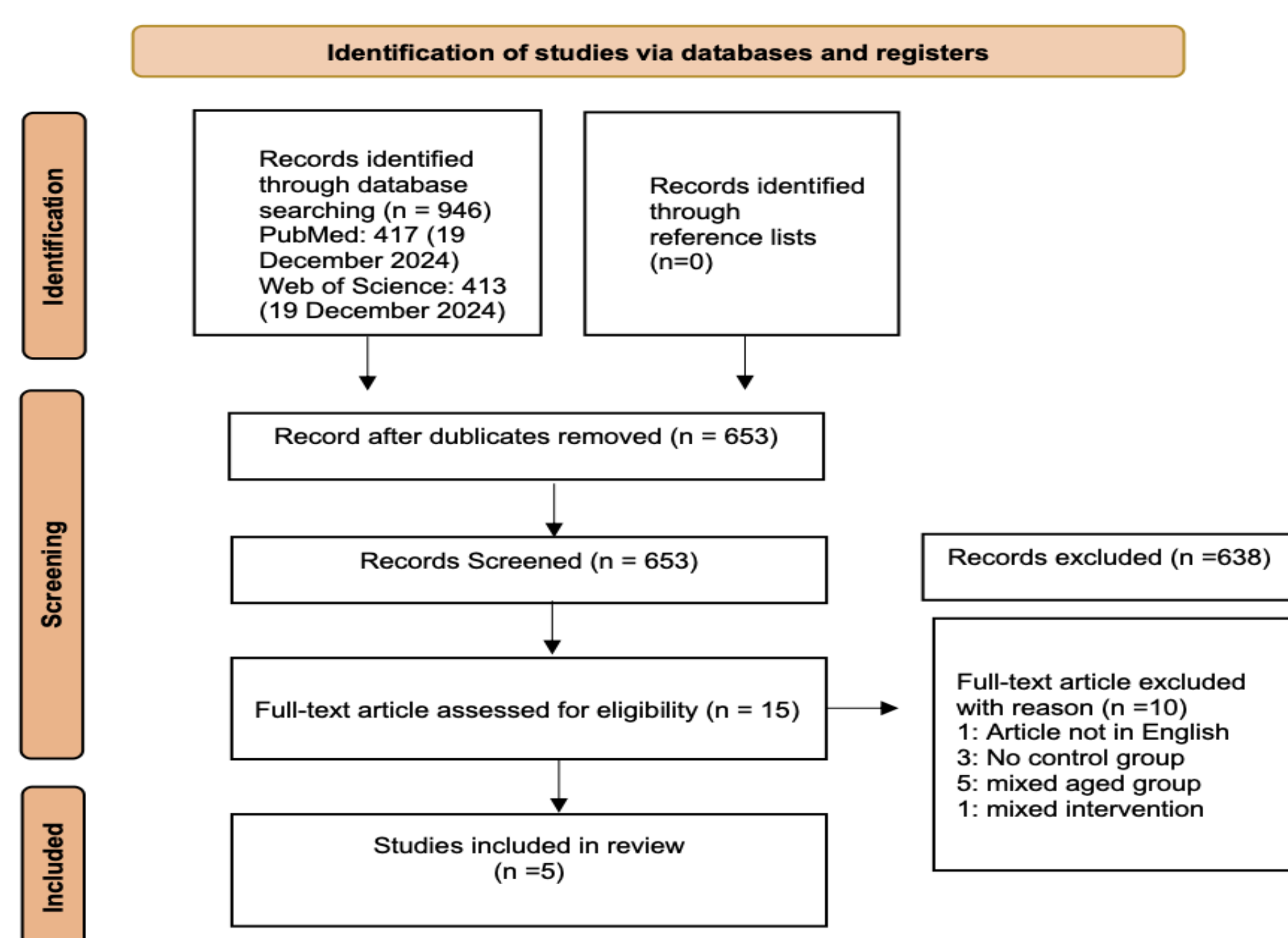
The aim of this review is to summarize and critically appraise the available evidence on home-based exercise interventions in children and adolescents diagnosed with ALL.

2 Methodology

- Systematic review conducted according to PRISMA guidelines
- Databases searched: PubMed, Web of Science
- Final search date: December 17, 2024
- Study selection: 946 records identified 653 after duplicates removed 15 full-text articles assessed 5 studies included

PICO(s)	Inclusion	Exclusion
Population	Children or Adolescents with ALL (treated with chemotherapy or hematopoietic stem cell transplantation)	Adults patients with cancer (> 18 years)
Intervention	Home Based Exercise Programme	Supervised exercise program Studies using combined supervision and home exercises Web-based rehabilitation Telerehabilitation
Comparator	Includes Control Group	Without Control Group
Study Type	Randomized Controlled Trial	Case report, case series Controlled studies
Language	English	Other Language
Year	Published after 2000	-

3 Results 1



From 946 records, only 5 studies met inclusion criteria. Home-based exercise programs demonstrated positive effects on physical health in children with ALL. Improvements were mainly observed in:

- Physical fitness
- Functional capacity

Despite positive findings: Evidence remains limited and heterogeneous

4 Results 2

Key Findings;

- **Physical Improvements:** Home-based exercise programs demonstrated positive effects on cardiopulmonary fitness, muscle strength, and joint range of motion (e.g., ankle dorsiflexion).⁴
- **Fatigue Management:** Interventions incorporating regular exercise and relaxation techniques showed potential in reducing disease- and treatment-related fatigue, though results varied across studies.^{5,6}
- **Logistical & Psychological Benefits:** Transitioning rehabilitation to the home environment minimizes the risk of exposure to infectious agents while significantly reducing the time, travel, and stress burdens on both patients and their families.⁷
- **Crucial Success Factors:** High adherence rates were heavily dependent on active family support, the availability of monitoring (online or face-to-face), and the use of age-appropriate, individualized exercise plans.⁸

5 Discussion

- Home-based exercise interventions demonstrate promising effects on physical outcomes in children with ALL⁹
- These findings support the role of exercise as an important component of supportive pediatric oncology care
- In particular, home-based programs offer a feasible and accessible alternative to supervised rehabilitation
- However, the current evidence is limited by:
 - Small number of studies
 - Small sample sizes
- Heterogeneity in interventions and outcome measures
- Therefore, the existing literature does not yet allow for strong or definitive clinical recommendations
- Further research is needed to establish standardized and evidence-based protocols.

6 Conclusion

Home-based exercise interventions possess significant potential to improve physical health parameters during and after cancer treatment in children with ALL.

To successfully integrate these remote rehabilitation protocols into standard clinical practice, future studies must utilize larger, homogeneous sample sizes and adhere to stricter methodological standards.

Reference

- 1 Schmidt Andersen, J., Caru, M., Wurz, A., et al. (2025). Supervised physical activity interventions in children and adolescents with cancer undergoing treatment — A systematic review. *Current Oncology*, 32(4), 234. <https://doi.org/10.3390/curroncol32040234>
- 2 Fiiza Luces, C., Valenzuela, P. L., Morales, J. S., & Lucia, A. (2018). Exercise training in childhood cancer: A systematic review and meta analysis of randomized controlled trials. *Cancer Treatment Reviews*, 70, 154-167. <https://doi.org/10.1016/j.ctrv.2018.08.012>
- 3 Yeh, C. H., Man Wai, J. P., Lin, U. S., & Chiang, Y. C. (2011). A pilot study to examine the feasibility and effects of a home based aerobic program on reducing fatigue in children with acute lymphoblastic leukemia. *Cancer Nursing*, 34(3), 3-12. <https://doi.org/10.1097/NCC.0b013e3181e4553c>
- 4 Manchola-González JD, Bagur-Catalaf C, Girabent-Farrés M, Serra-Grima JR, Pérez RA, Garmacho-Castaño MV, Ramírez-Vázquez R (2020) Effects of a home-exercise programme in childhood survivors of acute lymphoblastic leukaemia on physical fitness and physical functioning: results of a randomised clinical trial.
- 5 Moyer-Mileur LJ, Ransdell L, Bruggers CS (2009) Fitness of children with standard-risk acute lymphoblastic leukemia during maintenance therapy: response to a home-based exercise and nutrition program. *J Pediatr Hematol Oncol* 31(4):259-266.
- 6 Yeh CH, Man Wai JP, Lin US, Chiang YC (2011) A pilot study to examine the feasibility and effects of a home-based aerobic program on reducing fatigue in children with acute lymphoblastic leukemia. *Cancer Nurs* 34(1):3-12
- 7 Marchese VO, Chiarello LA, Lange B (2004) Effects of physical therapy intervention for children with acute lymphoblastic leukemia. *Pediatr Blood Cancer* 42(2):127-133.
- 8 Zupancic S, Jones H, McRae L, Papaconstantinou E, Weston J, Stremier R (2017) A sleep hygiene and relaxation intervention for children with acute lymphoblastic leukemia: a pilot randomized controlled trial. *Cancer Nurs* 40(6):488-496.
- 9 Mizrahi D et al (2022) Supervised exercise interventions in childhood cancer survivors. *J Cancer Surviv*.



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