

Exercise in patients with amyotrophic lateral sclerosis: A meta-analysis

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Introduction

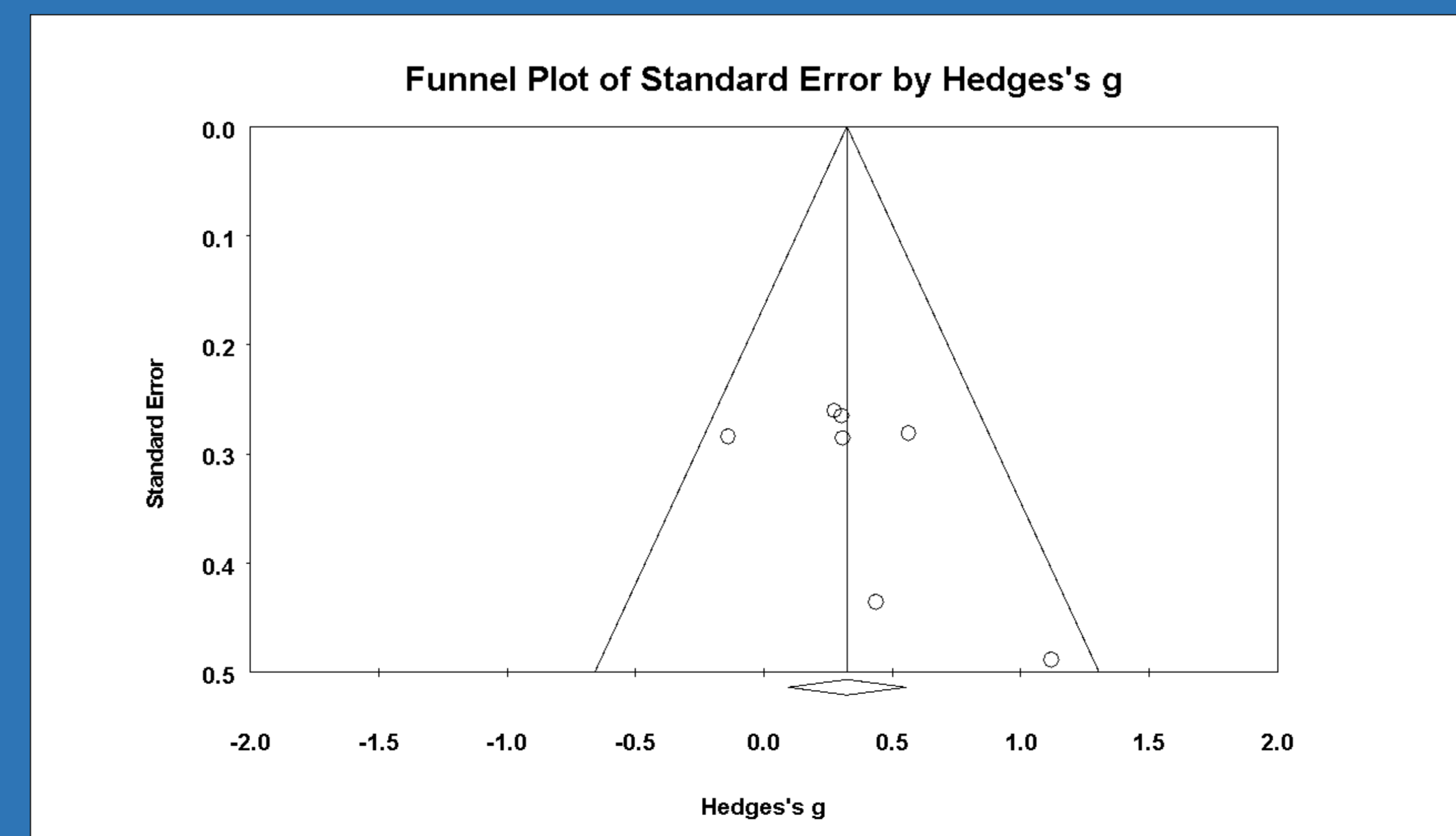
- Patients with amyotrophic lateral sclerosis (PALS) present with progressive limb, respiratory, and bulbar impairments.
- Preliminary research supports moderate exercise may be beneficial in PALS, while strenuous exercise is contraindicated.
- **Study aim:** To systematically evaluate outcome measures related to function and quality of life following exercise in PALS following PRISMA guidelines.

Methods:

- **Electronic databases:** CINAHL, Scopus, PubMed, Cochrane.
- **Inclusion criteria:** full-text article published in English, exercise-based intervention study involving human subjects diagnosed with ALS/MND.
- **Study design:** Oxford Centre for Evidence-Based Medicine Levels of Evidence.
- **Study quality:** QualSyst.
- Two authors rated evidence and extracted data.
- Outcomes were analyzed with Comprehensive Meta-Analysis (CMA) V2 software, random effects models, and Hedge's G.
- Effects examined at 0-4 months, up to 6 months, and >6 months.
- **Outcomes evaluated:** ALSFRS-R, FVC, FSS, McGill QOL, and FIM.
- Pre-specified sensitivity analyses were performed for 1) controlled trials vs. all studies and 2) ALSFRS-R bulbar, respiratory, and motor subscales.
- Heterogeneity of pooled outcomes was computed with the I^2 statistic.

Only the **ALSFRS-R** demonstrated a **potential benefit** from exercise in **PALS** due to the **heterogeneity** across studies.

Inconclusive findings regarding the **benefits** of **exercise** on **respiratory** and **swallow** function due to few studies reporting **respiratory** and **swallow** outcomes.



Results

- 24 articles initially met inclusionary criteria.
- 62.5% of studies (N=15) were level 1b or 2b, graded as having strong-good quality and were included in the meta-analysis.
- Only the ALSFRS-R demonstrated a favorable summary effect size (Hedge's G= 0.325, $p < 0.05$) and had acceptable heterogeneity ($I^2 = 2.393$) and dispersion (Cochran's $Q = 6.147$, $P = 0.407$, $\text{Tau}^2 = 0.002$)
- FIM scores also demonstrated a favorable summary effect size, but heterogeneity limited interpretations ($I^2 = 76.554$, sensitivity analysis failed).
- Other metrics couldn't be reported due to few studies reporting outcome measures.

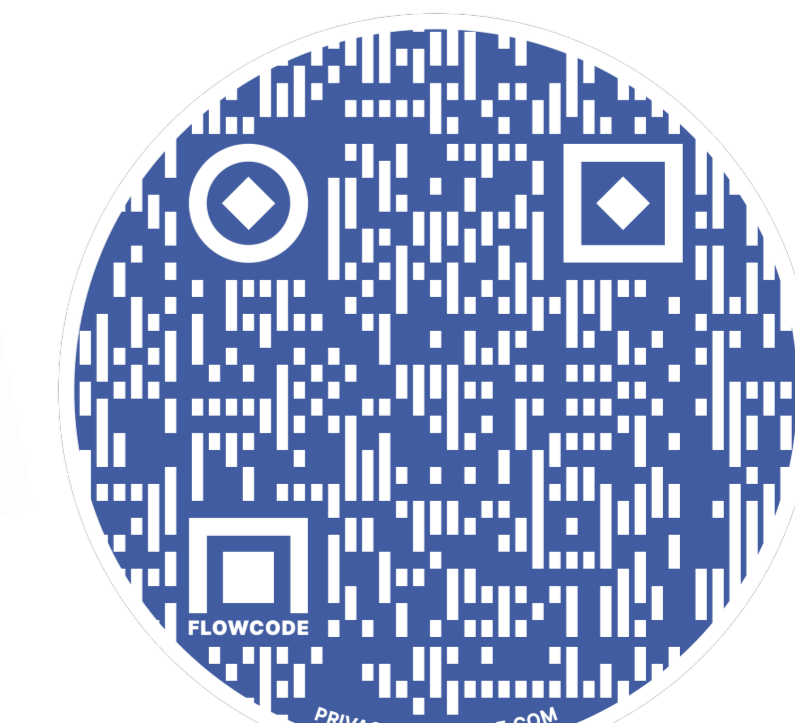
Limitations

- Small sample sizes (range: 1-105).
- High attrition rates (range: 0-80%).
- Methodological heterogeneity (study design and conduct).
- Participant heterogeneity (time since disease onset, baseline disease severity).
- Clinical heterogeneity (variable interventions and outcome measures).

References

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