Limitations in the Evidence on the Use of AFOs Following Stroke: A Systematic Review

Renad Albasri[1], Chris Cox[1], Dr Andy Kerr[1]
[1]Department of Biomedical Engineering, University of Strathclyde
Corresponding author: renad.albasri@strath.ac.uk

University of Strathclyde Glasgow

Background

Current evidence

Previous systematic reviews have identified limited reporting of participant characteristics and AFO specification in orthotic research involving children with cerebral palsy (1, 2). The Best Practice Statement on the Use of AFOs Following Stroke highlights poor study design and limited reporting but does not provide a quantitative evaluation of the limitations (3).

Objectives

To identify limitations in the literature on the use of AFOs following stroke and establish guidelines to improve future research design and reporting.

Methods

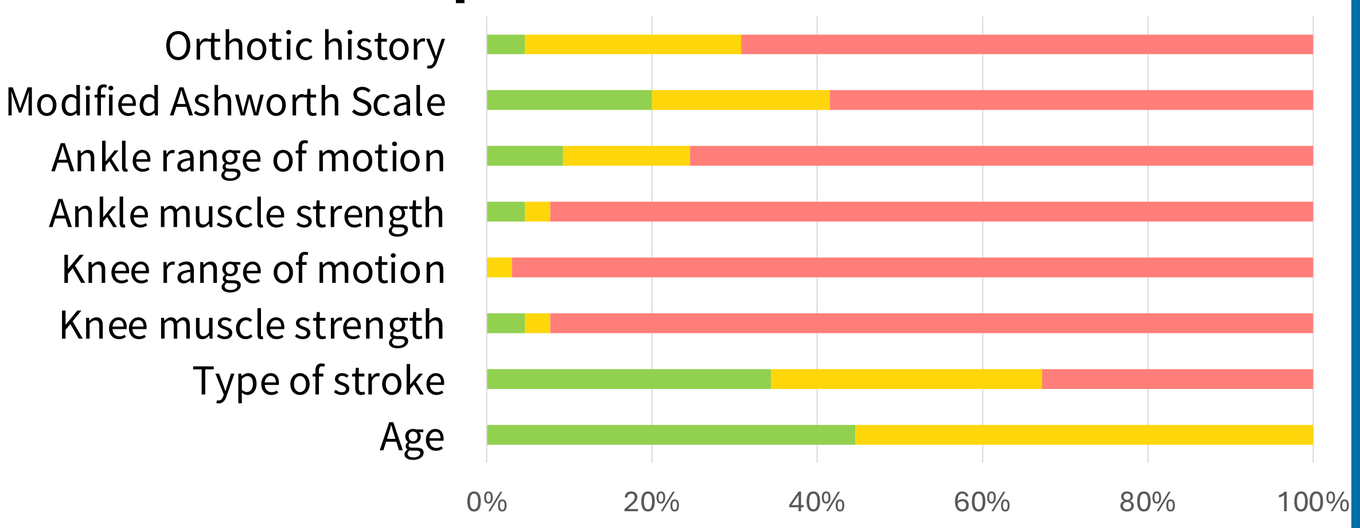
Search strategy

MEDLINE, EMBASE, PubMed, CINAHL, Web of Science; (Stroke OR cerebrovascular accident OR post-stroke OR ischaemic stroke OR haemorrhagic stroke OR hemiplegia OR hemiparesis) **AND** ("ankle-foot orthosis" OR AFO OR "ankle foot orthoses"); PROSPERO ID: CRD420251029346.

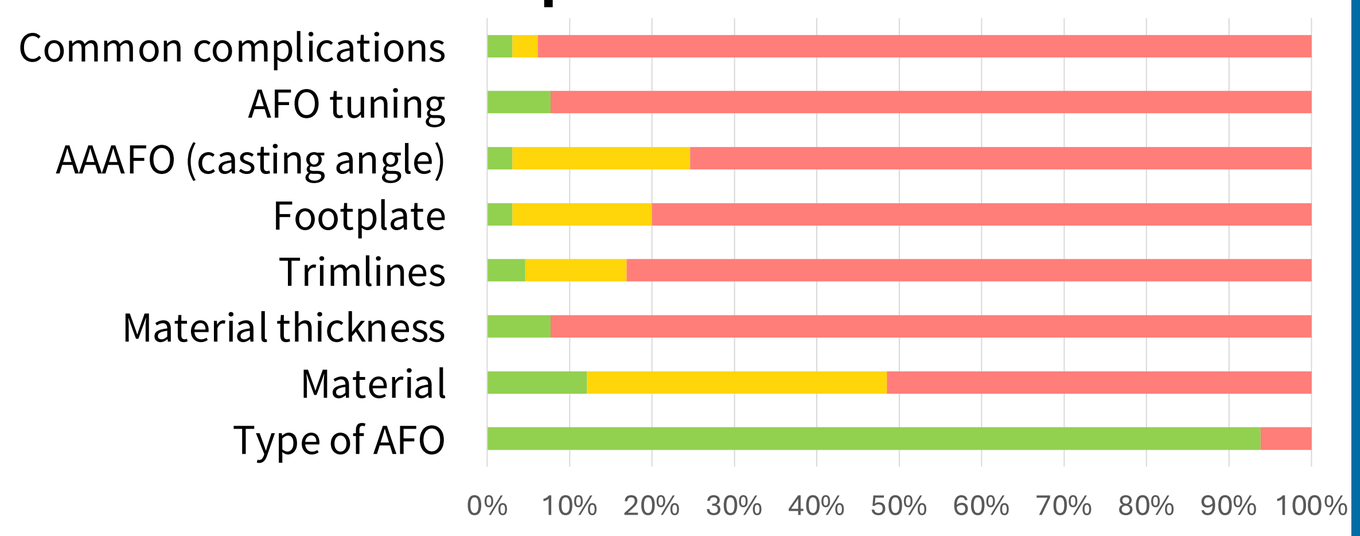
Inclusion criteria

Peer-reviewed studies, after 2009, involving adults post-stroke using any clinical AFO and reporting kinetics, kinematics or spatiotemporal gait parameters.

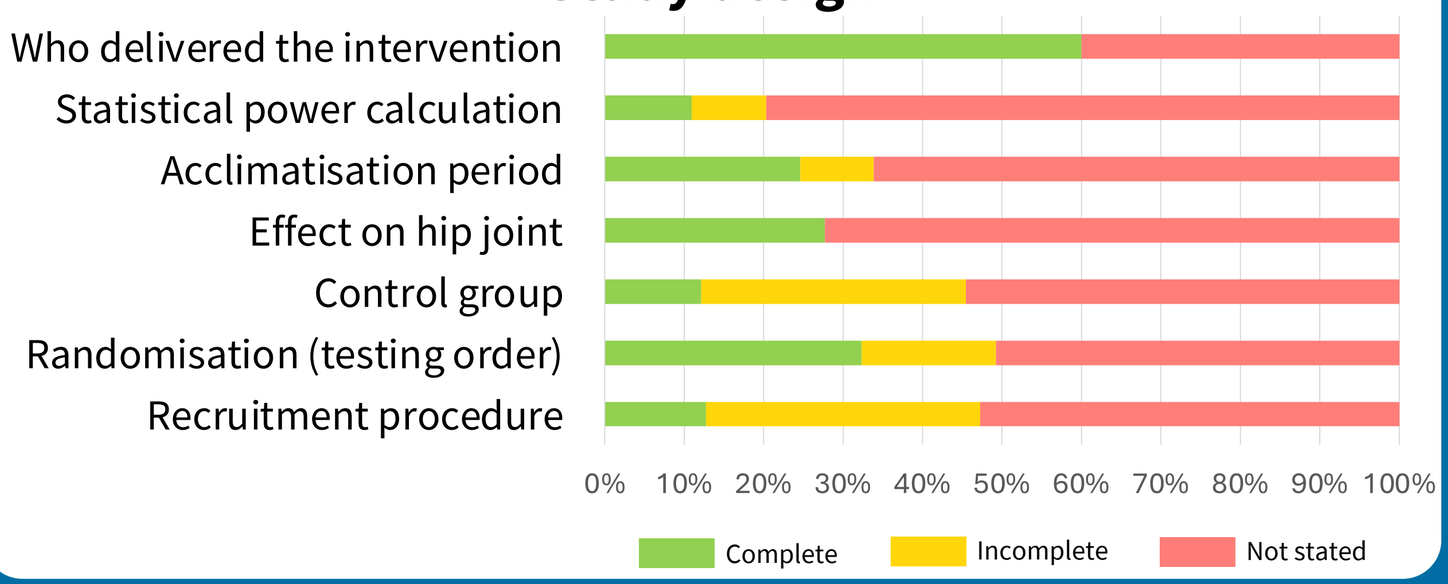
Participant characteristics



AFO specification



Study design



Study characteristics

- n = 60 studies included on AFO use following stroke.
- Sample sizes ranged from 1 to 139 (mean = 34), with both ischaemic and haemorrhagic strokes represented, although stroke type was not consistently reported.
- AFO types included solid, articulated, dynamic, oil damper, carbon fibre, and posterior leaf spring.
- Findings were generally supportive of AFO use, demonstrating improvements in kinetics, kinematics, and spatiotemporal gait parameters.

Implications for clinical practice

- The methodological limitations impede the translation of research into clinical practice.
- Incomplete reporting of participant characteristics and AFO specification prevents replication of AFOs and limits clinical applicability.
- Lack of transparency restricts the ability to determine whether interventions are appropriate for individual patients.
- These omissions reduce confidence in the evidence and contribute to inconsistency in AFO prescription across clinical settings.

Implications for future research

- The lack of reporting of participant characteristics, AFO specification, and study design restricts replication and limits research progression.
- These gaps prevent refinement of methodologies and evaluation of how design features influence outcomes.
- Inconsistent study design and inadequate reporting prevent structured comparison across studies.
- Without standardised outcome measures and defined intervention protocols, data cannot be synthesised meaningfully, limiting the feasibility of meta-analysis to inform orthotic practice.

Recommendations

1. Collaborate with orthotists during study design and intervention delivery to ensure clinical applicability.
2. Adhere to proposed guidelines on study design and reporting.
3. Provide full participant characteristics and AFO specification in the supplementary materials.

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References

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2. Eddison N, Mulholland M, Chockalingam N. Do research papers provide enough information on design and material used in ankle foot orthoses for children with cerebral palsy? A systematic review. *J Child Orthop.* 2017;11(4):263–71.
3. Bowers R, Ross K. Best Practice Statement: Use of Ankle-Foot Orthoses Following Stroke. NHS Quality Improvement Scotland; 2009.