Clinical outcome measurement in pediatric lower limb prosthetics: A modified Delphi consensus study

ABSTRACT

Introduction: Insufficient information exists on the use of outcome measures for children with lower limb loss or difference (LLLD) who use a prosthesis. This study aimed to determine which areas of assessment clinicians perceive as important when providing holistic care to these children and provide recommendations on which outcome measures to use, when to administer them, and how measurement strategies change throughout a child's development.

Methods: A modified Delphi study, using REDCap for data collection, was conducted with a multidisciplinary group of clinical experts, including prosthetists, researchers, physical therapists, orthopedists, physiatrists, and advanced practice providers. Experts completed four survey rounds: one open-ended and three iterative postulate rounds. Consensus was defined as at least 75% agreement among experts for each postulate.

Results: Twenty-nine of the thirty-five enrolled experts (83% response rate) completed at least three of the four survey rounds. A total of 54 postulates met consensus. Postulates were organized into measurement strategies for four pediatric age groups (toddlers/preschoolers, early elementary school children, late elementary school children, and adolescents) to facilitate clinical implementation. Some constructs were consistent across age groups while others varied. Mobility, pain, and comfort were important across all groups, although specific measure tools changed with age. Developmental milestone assessment was determined necessary only when developmental delay was suspected of children in early elementary school with a shift to functional assessments thereafter. Other constructs became increasingly important with age included prosthesis satisfaction, independence, and quality of life beginning in early elementary school and peer attitudes/psychosocial factors and body image beginning in late elementary school. A concise and comprehensive summary table, organized by age group, with specific outcome measure recommendations across ten areas of assessment is included for clinical reference.

Clinical Relevance: To our knowledge, this study is the first to provide multidisciplinary expert consensus on measurement strategies to guide clinical practice for treating children with LLLD who use a prosthesis. The findings highlight the importance of customizing assessments based on age and specific patient circumstances.