
CONFERENCE ABSTRACT

Exploring the role of strength training for enhancing physical performance testing and injury prevention in children and adolescents: A Literature Review and Narrative.

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Introduction

Research historically advised children and adolescents to avoid strength training due to assumed injury risk and adverse cardiovascular impact. Recent research indicates that strength training offers multiple benefits for children and adolescents, when appropriately prescribed and supervised. However, there are low levels of children and adolescents who participate in strength training, particularly amongst those who are not involved in competitive sports.

Theory/Methods

Literature was reviewed from University of South Wales 'FindIt', PubMed and EBSCOHOST databases. Searches relating to title keywords were used. Keywords utilised a combination of 'strength training', 'children', 'adolescents', 'physical performance testing' and 'injury prevention'. 227 pieces of literature were retrieved and 164 met the inclusion criteria. Official websites were accessed and direct contact was made with relevant government agencies and departments of education. Hand searches and cross reference searches were carried out in accordance with the inclusion criteria.

Results

Prevalence of strength training in primary and second level schools is currently unknown. Physiological adaptations from youth strength training are neuromuscular predominantly, whilst morphological changes of muscular, tendinous and bony origin occur to a lesser extent. Despite wide group heterogeneity, youth strength training has moderate effects on muscle strength and vertical jump performance and small effects on linear sprint, agility and sport-specific performance proxies. Strength training programmes have been shown to prevent injury and reduce injury rates in youth athletes, once proper techniques are taught and supervised by appropriately trained personnel.

Discussions

The wide heterogeneity within many variables such as definitions of age made research analysis difficult. The use of biological age is deemed superior to chronological age to optimise individualised exercise prescription for strength training in youth athletes, in conjunction with progressive loading, individual technique capability, youth development and sporting specificity.

Conclusions

Strength training for children and adolescents is safe and effective for enhancing physical performance and injury prevention when supervised, individualised and progressively loaded. However, its role is currently underexplored in the global school environment, resulting in its underexposure to a cohort of children and adolescents who do not participate in competitive sports.

Lessons learned

The weakness of definitions around strength training made research analysis very challenging. Weightlifting was intermittently included by some researchers as a component of strength training in youth, despite the consensus of literature advising against youth weightlifting until skeletal maturity has been reached. Definitions need to be clear, concise and accurate to provide high quality research.

Limitations

Data analysis was difficult due to wide heterogeneity between variables. The literature reviewed used different combinations of training parameters such as frequency of training, intensity and number of repetitions/sets. The majority of research reviewed had a PEDro score of < or equal to 6 which identifies a high risk of research bias based on these scores.

Suggestions for future research

This literature review advises international paediatric academies to strengthen relevant topic definitions and exclude weightlifting from all youth strength training prospective research. The use of biological age should be the only age variable used in future studies.