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Strength and Conditioning in Schools: A Strategy to Optimise Health, Fitness and Physical Activity in Youths

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Introduction

There is global concern surrounding the current lifestyle behaviours and future health and well-being of youth (1). Levels of physical activity, aerobic and muscular fitness in youth are in decline (2) with such trends further worsened by the COVID-19 pandemic (3). Increases in obesity prevalence suggest that many youth do not develop the requisite skills to sustain a physically active lifestyle. Concurrently, the World Health Organisation 2020 youth physical activity guidelines recommend 60 minutes per day of moderate-to-vigorous activity and three days of muscle and bone strengthening activities per week for health outcomes such as physical fitness, cognitive development and mental health (4). Youth development consensus statements (5) also recommend the implementation of strength and conditioning (S&C), defined as the application of scientific exercise prescription principles to improve physical outcomes aligned to each individual's needs. Whilst the lack of governmental strategies for addressing these concerns within schools have been discussed (6), schools arguably provide the most suitable contexts to support multi-dimensional health outcomes through consistent education and exposure to appropriate types and levels of physical activity. Therefore, the integration of S&C within schools, through physical education (PE), extracurricular activities, sport, play and education may help to develop youth with 'mens sana in corpore sano' or 'a healthy mind in a healthy body'.

Current Barriers

Several barriers have been identified to implementing S&C in youth (7). These include: 1) a perceived lack of value and misunderstanding of promoting health through skill-related components of physical fitness (e.g., misconceptions on the safety of youth resistance training); 2) a tendency for youth activities to focus upon sport-specific skills and competition; and 3) school timetabling implementing 'health and fitness' at limited time points each year focusing instead on games and sport-based curricula rather than year-round aerobic and strength-based activities (8). Such barriers may represent a lack of awareness of the importance of S&C, including the relationship between motor skill and strength building activities and positive short- and long-term health outcomes (5; 8). Participation in a games- or sports-based curricula alone, especially during childhood in primary school, does not ensure suitable development of strength, neuromuscular fitness, and motor skills (7). Most youth also do not have access to S&C provision (e.g., qualified coaches, equipment, facilities), and teaching or coaching staff are unlikely to possess more than a limited understanding of S&C, meaning such problems are likely to continue.

Strength and Conditioning in Schools

To overcome these issues, it is recommended that those responsible for the health of youth invest appropriate resources for S&C provision within the school setting. Specifically, the integration (not just the addition) of S&C within PE and extracurricular activities could be a strategy to enrich the curriculum for long-term health, fitness and physical activity priorities. Examples of implementing S&C programs in schools include: 1) exposure to movement skills and muscular strength development in childhood to facilitate early neural responsiveness to motor skill and resistance training; 2) the implementation of regular S&C activities within warm ups as part of PE lessons; 3) the design and implementation of small-sided games to concurrently develop aerobic fitness; and 4)

the implementation of an appropriate and progressive resistance training programme, both within and outside of the school timetable.

Within schools, modern-day policies have resulted in increased demands on all school stakeholders that competes with meaningful opportunities to enhance health and well-being. We recommend the integration of S&C within schools through the appointment of S&C practitioners in individual schools (9). Although most S&C practitioners are primarily employed to support competitive athletes, the health, fitness, and well-being benefits of S&C should be accessible to all youth. To promote impactful change, we propose two solutions for schools to consider based upon their contextual, leadership and curriculum restrictions:

- 1) The appointment of youth S&C practitioners to support and integrate S&C principles and physical activity guidelines, especially vigorous activities (4), through a variety of curricular streams (e.g., PE, afterschool programmes). To achieve this, schools may consider employing qualified (i.e., higher education degree; professional accreditation) individuals with relevant experience, knowledge and psychosocial skills required for working with youth, especially teachers with S&C qualifications.
- 2) Enhance the knowledge base and skills of school staff in S&C, to increase recognition of the benefits of S&C, support pupils and stakeholders (e.g., parents) in achieving the physical activity recommendations. This could be achieved by providing continued professional development opportunities related to S&C through higher education institutions or professional organisations (e.g., United Strength & Conditioning Association, UKSCA).

Figure 1 presents how S&C could be implemented within a school and the key roles to consider when implementing S&C activities. Table 1 presents the current health trends within youth and the short- and long-term benefits associated with S&C.

Conclusion

The current health, fitness and physical activity of youth is a major a concern for society. Schools are an ideal environment for mass implementation of S&C interventions to support youth development. Schools should aim to systematically incorporate S&C and wider physical activity into year-round timetables. This could be achieved by employing qualified youth S&C practitioners, and/or educating and upskilling current staff and stakeholders.

Future research should focus upon: 1) the feasibility and barriers to S&C implementation within schools; 2) the evaluation of S&C implementation on short- and long-term multi-dimensional health outcomes in youth; and 3) the development of bespoke qualifications for S&C in schools through international S&C associations.

Figure Legend:

Figure 1: Integrating Strength & Conditioning in Schools

Note: Numbers indicate age in years

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References

1. Inchley J, Currie D, Jewell J, Breda J. Adolescent obesity and related behaviours. *World Health Organization*, 2017.
2. Sandercock GR, Cohen DD. Temporal trends in muscular fitness of English 10-year-olds 1998–2014: An allometric approach. *J Sci Med Sport*. 2019; 22(2): 201-5.
3. Jurak G, Morrison SA, Kovač M, Leskošek B, Sember V, Strel J, et al. A COVID-19 crisis in child physical fitness: Creating a barometric tool of public health engagement for the Republic of Slovenia. *Front Public Health*. 2021; 9. doi: 10.3389/fpubh.2021.644235.
4. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. 2020; 54(24): 1451-62.
5. Bergeron MF, Mountjoy M, Armstrong N, Chia M, Côté J, Emery CA, et al. International Olympic Committee consensus statement on youth athletic development. *Br J Sports Med*. 2015; 49(13): 843-51.
6. Weiler R, Allardyce S, Whyte GP, Stamatakis E. Is the lack of physical activity strategy for children complicit mass child neglect? *Br J Sports Med*. 2014; 48(13):1010-3.
7. Lloyd RS, Oliver JL, Faigenbaum AD, Howard R, Croix MBDS, Williams CA, et al. Long-term athletic development, part 2: barriers to success and potential solutions. *J Str Cond Res*. 2015; 29(5): 1451-64.
8. Baker J. Integrate strength and conditioning into the PE curriculum at secondary school. *Prof Str Cond J*. 2015; 38: 27-35.
9. Bishop CJ, McKnight P, Alexander C, Archer E, Hunwicks R, Cleather DJ. Advertising paid and unpaid job roles in sport: an updated position statement from the UK Strength and Conditioning Association. *Br J Sports Med*. 2019; 53(13): 789-90.

Table 1. Current Health Trends in Youth and Short- and Long-Term Benefits associated with Strength & Conditioning

Current Trends	Short-Term Benefits	Long-Term Adult Benefits
↓ Motor Competence	↑ Fitness	↑ Healthier Society
↓ Fitness	↑ Physical Activity	↑ Fitter Society
↓ Physical Activity	↑ Cognitive / Mental Health	↑ Participation in Sport
↓ Wellbeing	↑ Wellbeing	↑ Physically Active for Life
↑ Obesity Prevalence	↑ Academic Attainment	↑ Mental Health
↑ Injury Prevalence	↓ Injury Risk	↓ Injury Risk