

Exercise Capacity and Physical Fitness in Children and Adolescents with Kawasaki Disease: A Systematic Review

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Background

- Kawasaki Disease (KD) is the leading cause of acquired heart disease in developed countries.¹
- The majority of research supports that children in the chronic stage of KD can maintain a normal exercise capacity; however, children with a history of KD are up to 50% less active compared to healthy peers.¹
- In this review we define physical fitness as the combined effect of available exercise capacity and level of physical activity. (Figure 1)

Figure 1: Physical Fitness Definition



- The purpose of this review was to investigate if children and adolescents with a history of KD have decreased exercise capacity and if so, what physical or psychosocial factors may contribute to their physical fitness.

Methods

- Systematic literature search via PubMed, Embase, CINAHL, Cochrane, Scopus, and Web of Science.
- Search terms included, inclusion and exclusion criteria, and PRISMA flow chart can be found on the QR code.
- Downs and Black (D&B) score was used to quality appraise the 11 studies included in the final review.^{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

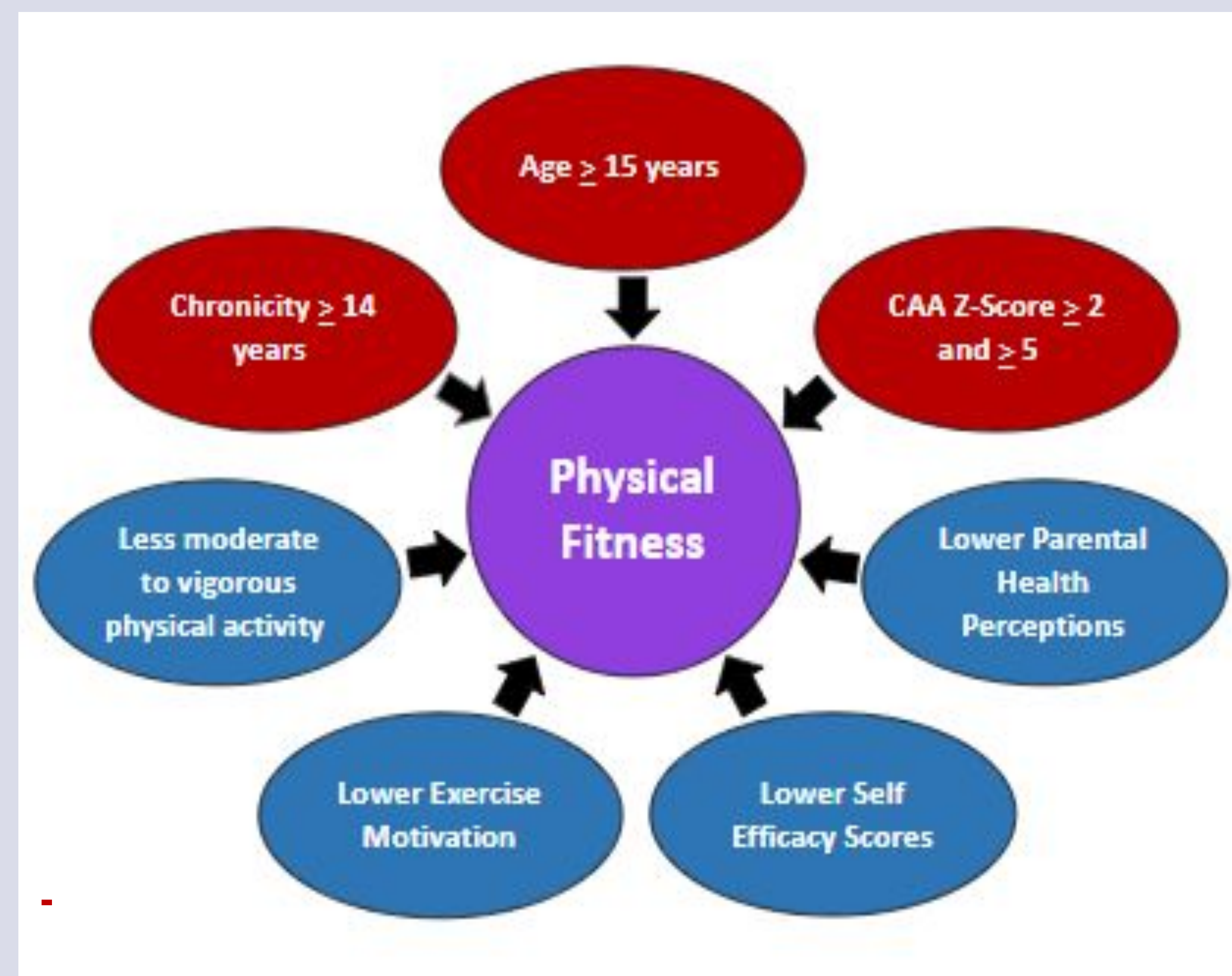


Additional Information

Results

- The average D&B score of the 11 studies was 18.45 +/- 0.55.
- 1,016 children and adolescents who had KD were included in the studies.
- The age range across studies spanned from 4 to 21 years of age.
- The chronicity, which was defined as duration of time from KD diagnosis to exercise stress test (EST) ranged from 4 to 17 years.
- The majority, 80%, of participants who had KD, were defined as having normal coronary artery status, while the remaining 20% consisted of children with regressed, dilated, small, medium, large, and giant coronary artery lesions (CAL). CAL was measured by coronary artery aneurysm (CAA) Z-score. Only 1% of participants included in this review had giant CALs.^{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
- Factors that impacted physical fitness are illustrated in Figure 2.

Figure 2: Summary of Factors that Negatively Influence Physical Fitness



References available via QR code

Discussion

- Our results demonstrate children, ages 8 to 14 years, who had KD may present with subclinical findings, including decreased peak rate pressure product during exercise and abnormal heart rate response in recovery, while maintaining normal exercise capacity.^{2,3,4,5,6,7,8}
- Our findings suggest the degree of coronary artery involvement, age, and stage of chronicity contribute to exercise capacity.^{3,5,9,10} Clinical manifestations may not become prominent until adolescence, for those with and without CALs, indicating the potential need for subsequent follow-up.^{9,10}
- Children and adolescents after KD perform less physical activity related to a variety of psychosocial factors highlighting the multitude of impacts on physical fitness.^{10,11,12}
- Providers appear hesitant to promote physical activity in patients who had KD with CAA despite the known benefits and current guidelines.^{1,12}
- Physical therapy and pediatric cardiac rehabilitation programs may be an opportunity to encourage safe, supervised, and effective physical activity for children and adolescents who had KD.^{1,13}

Future Research

- More research is needed to investigate physical fitness after KD and address contributing factors as well as explore the role of physical therapy, including cardiac rehabilitation, for children and adolescents after KD.
- Include those excluded in future studies.