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The Effects of 12 weeks Contact-free Combined Exercise Program on Health Fitness, Quality of Life, Physical activity and Kidney Function in Pediatric Patients with Chronic Kidney Disease

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Objectives: Children with chronic kidney disease (CKD) experience poor physical functioning, muscle wasting, and reduced cardiac functioning, which contribute to poor health fitness. Previous studies revealed regular physical activity improved exercise capacity and muscle strength in adults with CKD. Maintaining regular physical activity and exercising routinely in a home environment is an important strategy for a healthy life during the coronavirus crisis. The aim of this study is to assess the efficacy of a contact-free exercise program on health fitness, QOL and kidney function in children with CKD.

Methods: This prospective experimental study was conducted between June 2021 and August 2021, during the COVID-19 pandemic period. The contact-less combined exercise program consisted of aerobic and resistance training for 12 weeks at home. Participants had a live streaming class with the instructor once a week, watched and followed the recorded exercise video twice a week. Health-related fitness, physical activity level, QOL, and laboratory data were evaluated before and after the intervention. Health-related fitness measures included grip strength, sit-up test, sit and reach test, progressive aerobic cardiovascular endurance run.

Results: Fourteen children with CKD (male:female=13:1) enrolled at the median age of 13.5 (interquartile range (IQR) 13-15.8) years and five (35.7%) of them were on dialysis. After 12 weeks of the exercise program, all health-related fitness measures showed significant improvement ($P<0.05$). The median physical activity level reported by the questionnaire significantly increased from 861 (IQR 527-1357) to 2538 (IQR 2190-3302) ($P=0.011$). In patient self-reports, patients had better QOL after exercise program in physical, emotional, and social functioning categories. While blood urea nitrogen and low-density lipoprotein levels were decreased in pre-dialysis CKD patients after exercise, serum creatinine was increased in patients with dialysis.

Conclusions: A contact-free combined exercise program can effectively improve health fitness, physical activity, and QOL in pediatric CKD patients.