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"Flow-Based Adaptive Tennis Program for Improving Motivation and Muscle Strength in Children with Down Syndrome

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Children with Down syndrome face challenges in physical and psychological development, including muscle weakness and motor delays. This study aimed to test the effectiveness of a flow -based adaptive tennis program in improving muscle strength and motivation in children with Down syndrome. Flow approach is the optimal state of fully engaged activity that balances challenge and ability.
This mixed-methods study included quantitative data from muscle strength tests (sit-to-stand and handgrips) and qualitative data from observations of children's engagement during the exercises. Ten children aged 6–10 years participated in a four-week exercise program, twice per week. Each exercise session was designed with the principles of flow: clear goals, immediate feedback, and a fun atmosphere.
Results showed an increase in leg muscle strength (from 4 to 5.6 movements) and hand grip strength (from 4.9 kg to 5.5 kg). Flow scores also increased from 6.8 to 11.4. Children appeared more focused, happy, and engaged during the exercises. Parents reported increased enthusiasm and confidence in their children.
It is concluded that flow-based adaptive tennis program is effective in improving physical strength and motivation in children with Down syndrome. Furthermore, this approach can create a positive learning environment, increase engagement, and strengthen children's social relationships during physical activity. This program is recommended for widespread implementation in adaptive sports education and therapy.
Keywords: Down Syndrome, flow, motivation, adaptive sport, adaptive tennis

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