

DSFit: A pilot program to assess the impact of a multi-week supported exercise program on fitness and symptoms of anxiety and depression in adolescents with Down syndrome

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INTRODUCTION

- Individuals with Down syndrome (DS) are at an increased risk for inactive lifestyles^{1,2}, and co-occurring medical³ and mental health conditions⁴.
- More research is needed about mediation of these health risks using physical activity in children and adolescents with DS^{5,6,7}.

OBJECTIVES/AIMS

The purpose of this pilot study was to design a group exercise program for children and teenagers with DS that improved fitness levels and long-term wellbeing.

Specific aims were to assess:

- Ability to complete exercise correctly and independently as well as at-home compliance
- Changes in fitness (flexibility, strength, and endurance)
- Changes in symptoms of depression, anxiety, and attention

METHODS

Iteration 1: Boston Children's Hospital satellite (N=7)
Iteration 2: BCH main campus (N=7; 2 repeat participants)

Inclusion:

- Boys & girls 12-17 or 10-17 years old diagnosed with DS
- Medically cleared to exercise

Exclusion:

- Requires consistent one-on-one care
- History of severe behavioral issues

REFERENCES

- Wright-Carter MD, O'Neill JL, Dunford LK (2006) Physical activity patterns in children with and without Down syndrome. *Physical Therapy*. Apr-Jun;82(3):358-64.
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- Wright-Carter MD, O'Neill JL, Dunford LK (2008) Overweight and obesity in children and adolescents with Down syndrome: prevalence, determinants, consequences, and interventions. A literature review. *Am J Dev Disabil*. Oct; 113(10):652-66.
- Strawka C, Hojlo M, & Barnumway K. (2014) Mental health, behavior problems, and social behavior in adults with down syndrome. *Journal of Mental Health Research in Intellectual Disabilities*, 7, 74-80.

METHODS: PROGRAM STRUCTURE

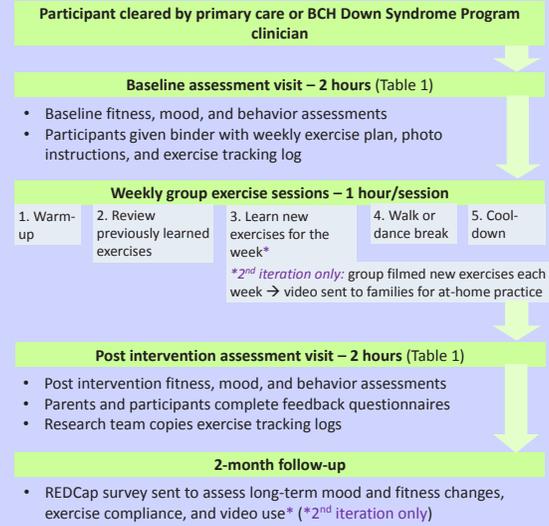
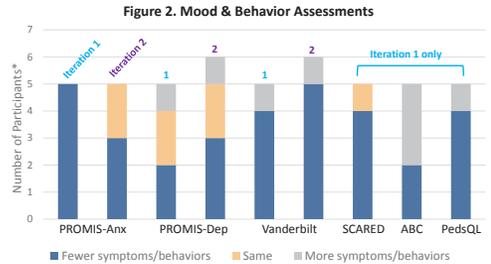
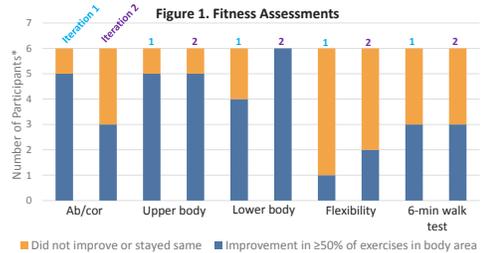


Table 1. Schedule and assessment formats for DSFit pilot iterations

	ITERATION 1	ITERATION 2
Schedule	10 total visits: Baseline visit → 8 group sessions → Post visit	8 total visits: Baseline visit → 6 group sessions → 7 th group session + Post
Fitness	Assessments conducted by ED, RS, and AB Core, upper body, lower body, flexibility & walking endurance	Same body groups assessed with modified exercises
Mood & behavior	Assessed via REDCap survey Parent report with child report option: <ul style="list-style-type: none"> Anxiety & depression [Patient-Reported Outcomes Measurement Information System (PROMIS)] ADHD & behavior [Aberrant Behavior Checklist (ABC) and Vanderbilt] 	Parent report only: <ul style="list-style-type: none"> Anxiety & depression [PROMIS] ADHD & behavior [Vanderbilt]
	Parent report only: <ul style="list-style-type: none"> Overall wellbeing & quality of life [Pediatric Quality of Life Inventory (PedsQL)] 	

RESULTS

- Fitness (Fig. 1) and mood/behavior (Fig. 2) raw scores from baseline and post assessments were compared for both iterations



*Data could not be collected on all participants due to fitness assessment compliance challenges and/or missing the post assessment visit

CONCLUSIONS

- The majority of participants in both iterations:
 - Improved in core, upper body, and lower body fitness
 - Showed fewer symptoms of depression, anxiety, and attention issues
- A group exercise program with supported at-home components is feasible and effective for children and teens with DS.
- Future iterations would benefit from a larger N and additional at-home supports like virtual sessions.