

Peer-led Physical Activity Intervention for Children with Type 2 Diabetes: description of a randomized pilot feasibility study



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INTRODUCTION

In Manitoba, rates of type 2 diabetes are among the highest in the world and disproportionately affect First Nations children. Current standards of care are not culturally relevant or suited to realities of social disadvantages.

The clustering of biological and social factors contribute to high rates of cardiovascular disease risk factors and rapid and aggressive microvascular complications.

Very few therapeutic trials exist for this population. Here we describe the methods for a recently funded trial to address this gap.

RATIONALE

We have already found that youth in the iCARE study who participated in regular vigorous intensity physical activity compared to youth who did not had lower HbA1c, diastolic blood pressure, and mean arterial pressure (Slaght et al., 2021).

We have shown in other work (IYMP) that a resilience-informed behavioral intervention, co-developed with patient partners and delivered by peer mentors, led to improved PA levels, body composition and quality of life.

We hypothesize that an intervention grounded in a resilience framework will increase daily physical activity and improve CVD-related risk factors in children with type 2 diabetes.

Table 1. Demographic variables and cardio metabolic health outcomes stratified according to participation in vigorous intensity physical activity in adolescents with type 2 diabetes

Variable	No Vigorous Intensity Physical Activity	Vigorous Intensity Physical Activity	p
n	97	67	
Female (n%)	67 (69.1)	46 (68.7)	1.000
Rural (n%)	79 (81.4)	49 (73.1)	0.284
Indigenous (n%)	94 (96.9)	56 (83.6)	1.00
Smoking (n%)	36 (37.1)	11 (16.4)	0.007
Mean age (yrs)	15.32 (2.79)	14.81 (2.08)	0.210
Median duration of diabetes (yrs)	2.50 (1.53, 4.63)	2.53 (1.07, 3.96)	0.324
Mean BMI Z score	2.31 (1.07)	2.53 (1.09)	0.191
Mean HbA1c (%)	10.0 (2.42)	9.01 (2.74)	0.016
Mean 24 hr SBP (mmHg)	126.0 (9.3)	122.9 (10.1)	0.05
Mean 24hr DBP (mmHg)	73.2 (5.5)	70.0 (6.1)	<0.001
Mean 24 hr MAP (mmHg)	90.3 (6.1)	87.3 (6.1)	0.003
Median daytime systolic load (%)	28.1 (15.4, 55.3)	23.6 (9.0, 48.2)	0.189
Median daytime diastolic load (%)	15.9 (6.8, 25.8)	10.10 (3.7, 20.8)	0.052
Mean Nighttime systolic load	55.7 (32.4)	43.87 (31.2)	0.030
Mean LDL (mmol/L)	2.38 (0.77)	2.36 (0.56)	0.850
Mean HDL (mmol/L)	1.18 (0.38)	1.17 (0.28)	0.841
Median triglycerides (mmol/L)	1.40 (1.00, 2.70)	1.60 (1.00, 2.10)	0.901
Physical Activity (MET-Hr/week)	68.5 (27.9, 160.5)	124.8 (75.5, 235.1)	<0.001

FRAMEWORK

Circle of courage + self determination theory

Intervention to be delivered by peer mentors with assistance from kinesiologists

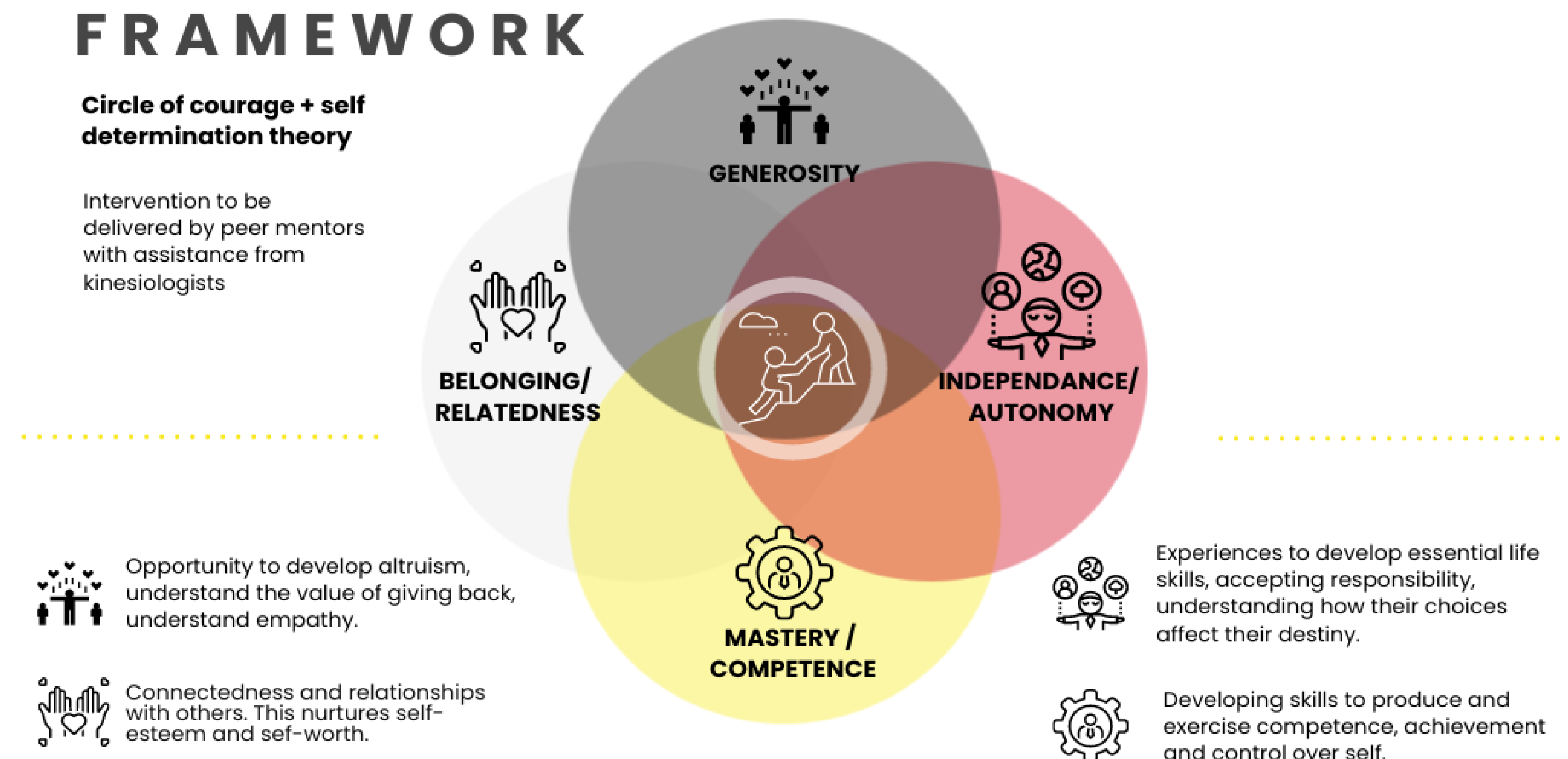
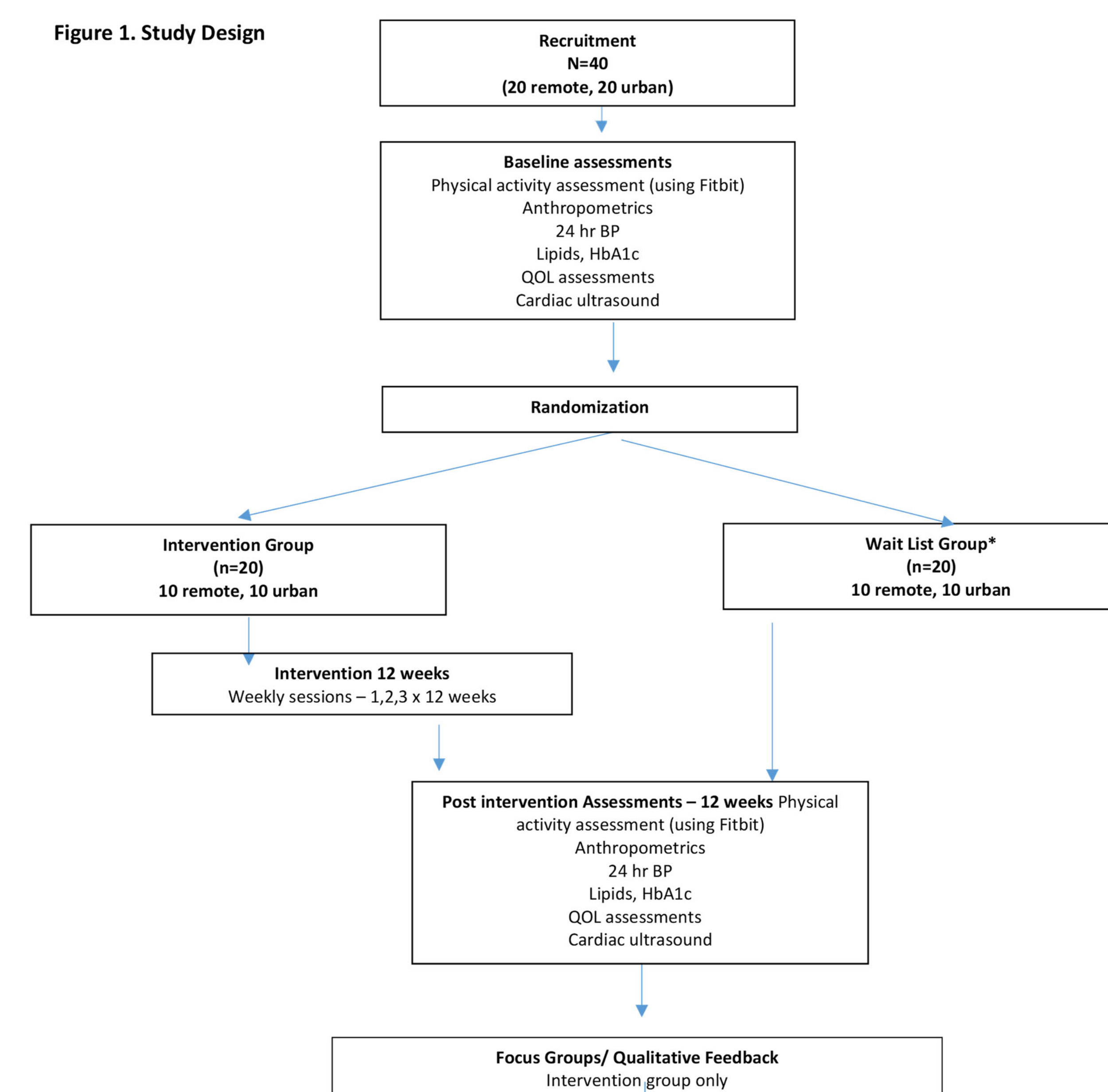


Figure 1. Study Design



STUDY DESIGN & METHODOLOGY

Population: 40 youth (14-17 years old) with type 2 diabetes. 20 living rurally and 20 living in an urban setting.

Intervention: A peer mentor led intervention to increase physical activity grounded in Self Determination Theory and the Circle of Courage.

Comparison: Participants will be randomized (1:1) into the intervention or control group. Control group will have all the same measurements and will continue to receive standard of care.

Outcomes: Primary outcomes are related to the feasibility of this trial

- Enrolment rates
- Adherence to the intervention
- Retention for follow up

Secondary outcomes:

- Daily physical activity
 - assessed by FitBit data
- Change in readiness for behaviour change using:
 - The Patient-based Assessment and Counselling for Physical Activity and Nutrition (PACE) readiness questionnaire
 - The Behavioural Regulation in Exercise Questionnaire (BREQ-3)
- Change in cardiovascular disease risk factors based on:
 - 24-hour continuous ambulatory blood pressure monitoring
 - Cardiovascular imaging with echocardiography

Time: The intervention will be 12 weeks, with a 24 week follow up visit.

WHY THIS IS IMPORTANT

The proposed trial will be the first behavioural trial of a peer-led intervention for children with type 2 diabetes.

The information could inform clinical approaches to behaviour change and cardiovascular disease risk management for children with type 2 diabetes.

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