Parents and Tots Together: Pilot randomized controlled trial of a family-based obesity prevention intervention in Canada

Kathryn Walton, MSc, RD,¹ A. Jordan Filion, MSc, RD,¹ Deborah Gross, PhD, RN,² Barbara Morrongiello, PhD,³ Gerarda Darlington, PhD,⁴ Janis Randall Simpson, PhD, RD,¹ Sharon Hou, BA,³ Jess Haines, PhD, RD¹

ABSTRACT

OBJECTIVE: To test the feasibility, acceptability and preliminary impact of Parents and Tots Together (PTT), a family-based obesity prevention intervention, in Canada.

PARTICIPANTS: Canadian parents of preschoolers (aged 2–5 years).

SETTING: Ontario Early Years centres in southwestern Ontario.

INTERVENTION: A pilot randomized controlled trial involving 48 parents who received either the PTT intervention ($n = 27$) or an attention-matched control home safety intervention ($n = 21$). To evaluate the feasibility of PTT, we assessed participant retention and outcome evaluation completion rates. To evaluate acceptability, we assessed program attendance and parents' responses to program satisfaction surveys. To evaluate preliminary impact, we assessed children's body mass index (BMI) at baseline, after intervention (end of 9-week intervention) and at 9-month follow-up. As well, at each time point, parents completed surveys assessing stress and self-efficacy related to parenting, children's sleep, activity, TV viewing and diet.

OUTCOMES: Retention rates were high in the intervention (93%) and control (84%) study arms, and 87% of parents reported that they would highly recommend PTT to a friend. At 9-month follow-up, intervention parents reported lower parenting stress ($\beta = 15.83$, 95% confidence interval [CI] -29.57 , -2.07 , $p = 0.02$) and greater self-efficacy in managing their child's behaviour ($\beta = 0.16$, 95% CI 0.002 , 0.33 , $p = 0.05$) than control parents. PTT had minimal influence on children's weight-related behaviours and BMI.

CONCLUSIONS: The results suggest that PTT can feasibly be implemented and tested in the Canadian context. Preliminary impact results suggest that the program may be effective in changing general parenting; however, program content should be modified to adequately address children's weight-related behaviours.

KEY WORDS: Childhood; obesity prevention; family-based intervention

La traduction du résumé se trouve à la fin de l'article.

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In Canada, approximately 30% of preschoolers aged 2 through 5 years are overweight and obese.^{1,2} Research suggests that parents have a strong influence on their children's weight and related behaviours through their feeding behaviours,³ modelling of weight-related behaviours⁴ (i.e., dietary intake, sleep habits, physical activity and TV viewing) and the provision of a home environment that either assists or impedes a healthy lifestyle.^{5,6} General parenting behaviours (i.e., those not specific to weight-related behaviours, such as discipline) may also affect child weight. Children of parents who use an authoritarian style of discipline (low responsiveness/high demands) are at increased risk of obesity as compared with children whose parents are authoritative and responsive to their needs.⁷ Research has also shown that parents who are experiencing high levels of parent-related stress are less likely to limit the amount of TV their preschoolers watch, and these children are also less likely to meet physical activity recommendations.⁸ Thus, family-based interventions that address both general parenting skills and weight-related behaviours may prevent excess weight gain in young children.

Although parents' influence on children's weight-related behaviours has been well established, research on family-based obesity prevention programs is limited, especially among young children.^{9–11} Our formative research suggests that addressing both general parenting and weight-related behaviours may enhance parent participation in family-based interventions;

Author Affiliations

1. Department of Family Relations and Applied Nutrition, University of Guelph, Guelph, ON
2. Department of Nursing, Johns Hopkins University, Baltimore, MD
3. Department of Psychology, University of Guelph, Guelph, ON
4. Department of Mathematics and Statistics, University of Guelph, Guelph, ON

Correspondence: Kathryn Walton, Department of Family Relations and Applied Nutrition, University of Guelph, 50 Stone Rd. E, Guelph, ON N1G 2W1, E-mail: kwatson@uoguelph.ca

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qualitative research has identified that US parents of preschoolers are keen to learn about general parenting skills but are less interested in child nutrition and physical activity.¹² To capitalize on this enthusiasm, we created Parents and Tots Together (PTT), a family-based obesity prevention intervention¹² that embeds strategies to improve preschoolers' nutrition and physical activity behaviours within an existing, empirically tested general parenting program.¹³ Although some family-based obesity treatment trials have tested programs that address both general parenting and weight-related messages,^{14,15} few studies have tested this approach for obesity prevention.^{16–18}

We have shown that PTT is feasible and acceptable among US families. Data from our pre-post, uncontrolled feasibility trial with parents of preschoolers living in Boston¹² revealed that 100% of parents were either “very satisfied” or “satisfied” with the program. Compared with when they started PTT, parents reported feeling more confident about helping their children develop healthy eating behaviours (67% “much more confident”; 33% “a little more confident”).¹² It is not known whether PTT is feasible or contextually appropriate for Canadian families, as family routines and practices may differ from those of US families. Community-based programs and supports for families with young children also differ between Canada and the US. The primary aim of this pilot randomized controlled trial (RCT) was to test the feasibility and acceptability of PTT and the RCT study design.¹⁹ Our secondary aim was to generate preliminary data on the efficacy of PTT, compared with an attention-matched control intervention, in changing general parenting behaviours, children's weight-related behaviours and children's body mass index (BMI) z score in Canadian families. The overarching goal of this pilot study is to inform a full-scale trial of PTT in Canada.

METHODS

Study design and participants

In 2013–2014, we conducted a pilot RCT of PTT with 54 Canadian parents of preschoolers aged 2–5 years. Because we wanted to test the feasibility of the intervention and study design in more than one centre, we attempted to recruit participants from three Ontario Early Years centres (OEYC): community centres that provide programming, education and support to families with young children. We determined a priori that centres would need to recruit a minimum of 12 families to be included in the study. To ensure that our recruitment materials reflected intervention and active control programs, the materials stated that we were testing a program to help parents raise healthy, happy children. Recruitment strategies included listing of the program on centre websites, flyers, newspaper ads and in-person recruitment by centre staff. Centre staff conducted eligibility screening with all interested parents either by phone or in person. Exclusion criteria were 1) inability to respond to surveys in English, 2) plans to move from the area during the study, 3) parents younger than 18 years of age and 4) children or parents with severe health conditions (i.e., cardiac concerns, severe asthma) that would inhibit participation in study activities. PTT is a primary prevention intervention; therefore, children were eligible regardless of weight status. Recruitment efforts were successful at two of three OEYCs; as only five parents at the

third site expressed interest in the study, that site was not included.

All eligible families from the two remaining sites were invited to information sessions at which parents read and signed informed consent forms, completed the baseline questionnaire, and had their children's height and weight assessed. The consent form identified this as a pilot study and informed families that they would be randomly assigned to attend parent sessions focused on either promoting healthy activity and eating behaviours or home safety. Because of space limitations at the centres, we were unable to provide our intervention and control sessions on the same day; thus, parents selected and signed up for one of the two weekly sessions offered. We used a stratified randomization scheme to assign each session to either intervention (PTT) or control (Supervising for Home Safety, SHS); the strata were the community centre sites. Once session sign-up was complete, the project manager used a pseudo-random number generator to randomly assign the sessions to intervention or control separately in each community centre site. Ethics approval was obtained through the University of Guelph Ethics Review Board.

Both the intervention and control programs ran for 9, weekly, 2-hour group sessions. Group facilitators for both study arms received training in group facilitation skills (4 hours) and on their respective program content (4 hours). In both study arms, we provided families with a meal and bus fare to attend. Parents summarized the top three take-home points at the end of each session and received handouts to share with partners/other caregivers. On the basis of findings from our earlier research, which suggests that if children are engaged in a program they can serve as strong motivators for parents' participation,²⁰ all children participated in interactive children's programs that ran concurrently with the parent programs.¹²

At the end of the 9-week intervention and at 9 months from baseline, families attended follow-up assessments. To minimize risk of contamination and bias, measurement staff held separate follow-up assessments for each study arm, and the staff who conducted the follow-up measurements were not involved in intervention delivery. Families received a \$20 gift card for completing each assessment (baseline, post-intervention and 9-month follow-up). At the 9-month follow-up assessment, a raffle for a \$100 gift certificate was held to encourage attendance. Home visits were conducted for families who could not attend follow-up sessions.

Treatment groups

Intervention: PTT

PTT is a family-based obesity prevention intervention delivered in group sessions. Detailed information regarding the development of PTT can be found elsewhere.¹² The overarching framework that guided the development of this intervention was the social contextual framework,²¹ which states that to be effective, interventions must take into account the social constructs as well as the key psychosocial constructs that influence behaviour. Selection of key psychosocial constructs to address, i.e., parental self-efficacy and social norms/support, was informed by social cognitive theory.²²

We worked with the developer of an existing, empirically tested general skills parenting program, the Chicago Parent Program

Table 1. Overview of general parenting and weight-related topics addressed in the Parents and Tots Together (PTT) intervention

Session	General parenting topic addressed	Weight-related topic addressed
1	Child-centred time	Being physically active with your child
2	Importance of family routines	Sleep: creating a bedtime routine
3	Using praise and rewards	Alternatives to using food as rewards
4	Setting limits	TV: setting limits on TV time
5	Threats and consequences	When not to use threats: identifying your child's hunger and satiety cues
6	Using ignore and distract strategies	Ignore and provide alternatives: reducing intake of sugar-sweetened beverages
7	Stress management	Family-based physical activities
8	Problem-solving skills with adults	Problem solving with partners and other caregivers about child's health behaviours
9	Putting it all together	Putting it together: weight-related behaviours

(CPP),¹³ to include lessons related to parental roles in promoting healthy nutrition and activity behaviours among their children (see Table 1). CPP employs videotaped vignettes, discussion questions about the parenting skills addressed in the vignettes and a collaborative interpersonal style for guiding discussions. For PTT, we used the same format, and we filmed vignettes that

addressed our weight-related behavioural messages using families from the Boston area.

Before testing PTT in Canada, we conducted focus groups with 26 Canadian parents of preschool-aged children to explore whether the PTT content, vignettes and handouts were relevant and appropriate to Canadian families.^{23,24} Overall, parents confirmed that the general parenting and weight-related topics addressed were relevant to their lives and were seen as useful to support families in raising healthy, happy children. However, families indicated that some content seemed “too American”; for example, after viewing a bedtime routine vignette that included a family praying before bed, families identified “that doesn’t really happen in Canada.” As a result, we filmed new, weight-related vignettes using Canadian families to help achieve content that was contextually relevant. Approximately 65% of program content focused on general parenting and 35% on weight-related behaviours.

Attention-Matched Control: Supervising for Home Safety

The SHS program is a 9-week group-based program focusing on child injury prevention. The program fosters parents’ knowledge of common home hazards and injuries, with the primary aim of encouraging more active (i.e., watchful, proximal) supervision of young children by parents in order to reduce the frequency of childhood injuries in the home. Like

Table 2. Feasibility and acceptability measures and results for the pilot RCT study design and the Parents & Tots Together intervention

Purpose	Variable	Method of assessment	Results
Feasibility of study design	Recruitment	Recruitment activity log* Discussions with OEYC program coordinators*	Recruitment was successful at 2 of the 3 OEYC sites; 1 site recruited 30 families and the other recruited 24 families over 4 weeks. 81% of families were recruited through in-person recruitment conducted by OEYC staff; 19% were recruited through the centre website. Flyers at the centre did not result in the recruitment of any families. The OEYC site where recruitment was unsuccessful did not use in-person recruitment.
	Program facilitator training	Attendance log for trainings* Program facilitator post-training survey† Observation of trainings*	All program facilitators attended and completed the training. All required material was covered. On the post-training survey, 60% of the facilitators reported being very confident and 40% reported being confident in leading the program sessions.
	Outcome assessment	Study records*	92% of families attended the post-intervention assessment sessions; 8% received home visits. 89% of families attended the 9-month assessment visit; 11% received home visits.
Feasibility of PTT intervention	Intervention fidelity	Weekly program facilitator surveys† Observation of all sessions* Weekly calls with program facilitators*	Session observation and feedback and checklists from facilitators identified that all required content was covered.
Acceptability of study design	Randomization	Comparison of follow-up rates in intervention and control*	The retention rate for families assigned to the intervention was 93% and to the control was 84%; 1 control family withdrew because of lack of interest in the topic.
Acceptability of PTT intervention	Attendance	Attendance log*	89% attended ≥7 PTT sessions, 3% attended 3–6 PTT sessions, and 7% attended ≤2.
	Parent satisfaction	Post-intervention survey‡ Post-intervention qualitative interviews with subsample of parents (n = 7) to assess opinions about the structure and content of the intervention‡	87% would highly recommend the program to a friend; 13% would recommend the program; 97% reported being more confident in managing their children's behaviour at home; and 78% of parents reported being more confident in helping their child develop healthy eating habits. All parents reported that they were satisfied (11%) or very satisfied (89%) with their program facilitator. Three principal themes emerged from the qualitative interviews: 1) Overall satisfaction: all parents reported enjoying the program; 2) Content: although parents indicated that all the program topics were relevant to their experiences as a parent, a few parents stated that some of the weight-related material was less relevant because they had “already incorporated it in our lives”; 3) Structure: all parents said that they enjoyed the group format and the opportunity to learn from “others’ stories and experiences”.

RCT, randomized controlled trial; OEYC, Ontario Early Years centres.

Completed by: * study staff, † PTT facilitator, ‡ parent participant.

Table 3. Description of the measures used to compare parenting and health behaviours among intervention versus control participants in the Parents and Tots Together pilot study

Behaviour	Details of measure	Description
Parental warmth	Parenting questionnaire ²⁵	7 items assessing "parental warmth": <i>Example question:</i> "I get angry with my child." <i>Response options:</i> 5-point Likert scale ranging from very often to never Chronbach's $\alpha = 0.71$
Follow-through on discipline	Parenting questionnaire ²⁵	7 items assessing "follow-through on discipline": <i>Example question:</i> "I give my child too many chances when he or she misbehaves." <i>Response options:</i> 5-point Likert scale ranging from never to very often Chronbach's $\alpha = 0.80$
Parenting stress	Parent Distress subscale of the Parenting Stress Index Short Form (PSI-4SF) ²⁶	12 items assessing "Parent Distress": <i>Example question:</i> "I find myself giving up more of my life to meet my children's needs than I ever expected." <i>Response options:</i> 5-point Likert scale ranging from strongly disagree to strongly agree Chronbach's $\alpha = 0.89$
Parent use of food as reward	Child Feeding Questionnaire (CFQ) ²⁷	1 item from the CFQ assessing the use of food as a reward for child behaviour: "I offer my child his/her favourite foods in exchange for good behaviour." <i>Response options:</i> 4-point Likert scale ranging from strongly disagree to strongly agree
Parental self-efficacy in managing child behaviour and dietary intake	Child Behavior & Dietary Intake: Toddler Care Questionnaire ²⁸	1 measure assessing parental self-efficacy in knowing child's satiety: "Figuring out when your child is full." 1 measure assessing parental self-efficacy towards child behaviour: "Dealing with your child's behaviour when he or she is aggressive with other children, such as hitting, biting, or pushing other children" <i>Response options:</i> 4-point Likert scale ranging from not at all confident to very confident
Child sleep		2 questions asked separately for week days/nights and weekend days/nights: "What time does your child usually wake up [go to bed] on weekdays [weekend days]?" Reports of week night and weekend night sleep were combined to determine average nighttime sleep.
Child physical activity – active play	Arredondo et al. ²⁹	2 questions asked separately for active play on weekday and weekend day: "How much time per weekday [weekend day] is your child involved in active play (such as running, jumping, climbing)?" Answers to this question were based on a 6-point Likert scale ranging from 0 minutes to 2 or more hours per day. For both weekday and weekend day active play, we assigned hours per day to the Likert scale (1 = 0 minutes per day, 2 = 7.5 minutes per day, 3 = 23.5 minutes per day, 4 = 45 minutes per day, 5 = 90 minutes per day, 6 = 120 minutes per day). Minutes of active play were then averaged between weekday and weekend day reports to determine average minutes of active play per day.
Child sugar-sweetened beverage (SSB) intake	Blum et al. ³⁰	"In an average week, how often did your child drink each of the following beverages: flavoured milk such as chocolate milk, 100% juice (no sugar added), fruit drinks (Hi-C, Kool-Aid, lemonade, sports drinks), soda (not sugar-free) or sugar-free soda. This questionnaire uses a 6-point Likert scale ranging from "Never" to "5 or more times per day" and has been validated for use with preschool children. From these questions, the subscales measuring flavoured milk, fruit drinks and soda were combined to determine the average frequency of SSB consumption. The subscales measuring 100% fruit juice and sugar-free soda consumption were not included in the analyses as these beverages do not contain added sugar.
Child TV viewing	Arredondo et al. ²⁹	2 questions asked separately about TV viewing on weekday and weekend day: "On an average weekday [weekend day] how much time per day does your child spend watching TV, including DVDs or videos?" Responses for weekday and weekend day TV viewing were averaged to determine the total number of hours the children spent in front of the screen per day.
NutriSTEP® nutrition risk score	Randall Simpson et al. ³¹	NutriSTEP® is a 17-item, parent-administered nutrition screening questionnaire. The questionnaire includes topics such as children's food and nutrient intake, physical growth and development, physical activity, food security and food environment. Completion of all 17 questions generates a score indicating the potential for nutrition-related problems. As per the NutriSTEP® protocol, raw scores were also assigned a risk category of low (total score of less than 20), medium (total score of 21–25) or high (total score of 26 or more) nutrition risk.

PTT, the SHS intervention used video vignettes, facilitated group discussion and homework.

Measures

Our primary objective was to measure the feasibility and acceptability of PTT and the RCT design within the Canadian context (see Table 2).

To assess our secondary objective of comparing parenting (parental stress, warmth, follow-through on discipline, use of food as a reward, self-efficacy in managing child behaviour and knowing child's satiety cues) and child health behaviours between intervention versus control conditions, parents completed a 30-minute online questionnaire at baseline, post-intervention and 9-month follow-up. Our health behaviours of interest were child sleep, physical activity, sugar-sweetened beverage (SSB) intake, TV viewing and nutrition risk (see Table 3). To assess change in BMI z scores, trained research assistants measured children's heights using a calibrated stadiometer and

weights using a calibrated electronic scale at baseline, post-intervention and 9-month follow-up. Using the World Health Organization (WHO) growth charts, we calculated BMI z scores to assess child weight across age and sex.

Statistical analysis

To assess the feasibility and acceptability of PTT and the RCT study design, we calculated frequencies for the attendance and recruitment data and examined the closed-ended questions from parent satisfaction surveys. Responses from individual interviews with parents on the relevance of the program were coded and summarized by two research staff using content analysis.³²

To assess the preliminary impact of PTT, we performed descriptive analyses to examine baseline participant demographic factors. Using intent-to-treat analysis, we ran separate regression models to examine differences between the intervention and control groups from baseline to post-intervention and baseline to 9-month follow-up. Child age and

Figure 1. Study design and participant flow of the Parents and Tots Together Pilot RCT

Table 4. Baseline parent and child characteristics of participants in the Parents and Tots Together randomized controlled trial ($N = 48$)

	Intervention, n (%) ($N = 27$)	Control, n (%) ($N = 21$)
Relation to child		
Mother	25 (92.6)	20 (95.2)
Father	2 (7.4)	1 (4.8)
Parental marital status		
Married/living with a partner	25 (92.6)	20 (83.3)
Single	2 (7.4)	4 (16.7)
Parental education obtained		
High school education or less	4 (14.8)	5 (25.0)
Some college/university	7 (25.9)	1 (5.0)
College graduate	6 (22.2)	5 (25.0)
University graduate	4 (14.8)	7 (35.0)
Post graduate training or degree	6 (22.3)	2 (10.0)
Race/ethnicity		
White	21 (77.8)	11 (52.3)
Black	0	1 (4.8)
Latin American	2 (7.4)	1 (4.8)
Asian/South Asian	4 (14.8)	8 (38.1)
Total household income		
<\$20,000	4 (14.8)	4 (20.0)
\$20,000–\$49,999	7 (25.9)	3 (15.0)
\$50,000–\$99,999	11 (40.7)	11 (50.0)
≥\$100,000	5 (18.6)	3 (15.0)
Child age, mean (SD) = 3.0 (0.91)		
2 years	4 (14.8)	10 (47.6)
3 years	16 (59.3)	9 (42.9)
4 years	4 (14.8)	0
5 years	3 (11.1)	2 (9.5)
Child sex		
Female	15 (55.6)	12 (57.1)
Child weight status		
Normal weight	18 (66.7)	15 (71.4)
Overweight	5 (18.5)	2 (9.5)
Obese	4 (14.8)	5 (19.0)

sex were controlled for in all models; models were considered significant at the $p < 0.05$ level. We performed all analyses using SPSS version 22 (PASW 2013, IBM, New York, US).

RESULTS

We randomly assigned 54 parent-child dyads to the intervention or control condition. Retention rates at both post-intervention and the 9-month follow-up for intervention and control arms were 93% and 84% respectively (Figure 1). Of the parents who completed the intervention ($n = 48$), most were the biological mothers of the child participants (94%, Table 4). The majority of parents were married or living with a partner (92.6% in intervention; 83.3% in control) and identified themselves as white (77.8% in intervention; 52.3% in control). Approximately 38% of families reported total household incomes of less than \$50,000/year (40.7% in intervention; 35% in control). The mean age of the children was 3.0 ± 0.9 years; 33% of children in the intervention and 29% in the control arms were classified as overweight or obese at baseline according to WHO cut-points.

Feasibility and acceptability

Table 2 outlines feasibility and acceptability results for the study design and PTT intervention. Recruitment was completed within 4 weeks, the most successful strategy being in-person recruitment conducted by OEYC staff. The retention rate was high among families randomly assigned to intervention (93%) and control (84%) conditions, suggesting that the randomization process was acceptable to participants. The completion rate for the evaluation was also high, supporting the feasibility of the evaluation procedure.

Of 29 parents assigned to the intervention arm, 26 (89%) attended > 7 of the 9 sessions, 1 (3%) attended 3–6 sessions, and 2 (7%) attended < 2 sessions (Table 5). Feedback and checklists from facilitators suggested that all the required content was covered. Twenty-seven parents (93%) completed the post-intervention survey. All reported that they would either “highly recommend” (87%) or “recommend” (13%) the program to a friend. All parents reported being satisfied (11%) or very satisfied (89%) with their program facilitator. Furthermore, 97% reported feeling more confident in managing their child’s behaviour at home (3% reported no change), and 78% of parents reported feeling more confident in helping their child develop healthy eating habits (22% reported no change). Findings from the qualitative interviews with parents mirror those from the post-intervention survey (Table 2).

Preliminary impact

Compared with control families, PTT parents reported less parental stress at post-intervention ($\hat{\beta} = -20.67$, 95% confidence interval [CI] $-31.67, -9.62$, $p = 0.001$) and 9-month follow-up ($\hat{\beta} = 15.83$, 95% CI $-29.57, -2.07$, $p = 0.02$), and more self-efficacy in managing their child when the child’s behaviour became aggressive (biting, hitting, pushing) (post intervention: $\hat{\beta} = 0.32$, 95% CI 0.04, 0.61, $p = 0.03$; 9-month follow-up: $\hat{\beta} = 0.16$, 95% CI 0.002, 0.33, $p = 0.05$) (Table 5). PTT parents also reported greater parental warmth at post-intervention ($\hat{\beta} = 2.59$, 95% CI 0.59, 4.59, $p = 0.01$) and 9-month follow-up ($\hat{\beta} = 2.04$, 95% CI 0.48, 3.59, $p = 0.01$). At post-intervention, PTT parents reported a larger

Table 5. Results of linear regression analyses examining differences in parenting behaviours and child health behaviours between intervention groups at baseline, post-intervention and 9-month follow-up ($n = 48$)

Behaviour	Baseline	Post-intervention	Adjusted difference (95% CI)	9-Month follow-up	Adjusted difference (95% CI)
	Mean (SD)	Mean (SD)	<i>p</i> value	Mean (SD)	<i>p</i> value
Parenting stress					
PTT	58.51 (29.68)	43.34 (27.16)	−20.67 (−31.67, −9.62) $p = 0.001^*$	43.62 (28.13)	−15.83 (−29.57, −2.07) $p = 0.02^*$
Control	54.66 (29.54)	62.15 (24.62)		57.42 (24.14)	
Parental warmth					
PTT	23.14 (2.89)	23.96 (2.16)	2.59 (0.59, 4.59) $p = 0.01^*$	24.25 (2.09)	2.04 (0.48, 3.59) $p = 0.01^*$
Control	20.71 (7.72)	22.27 (4.61)		22.38 (2.83)	
Follow through on discipline					
PTT	22.44 (3.52)	24.23 (3.43)	1.28 (−1.09, 3.65) $p = 0.28$	23.40 (3.70)	−0.92 (−3.16, 1.32) $p = 0.41$
Control	20.82 (8.59)	23.27 (3.86)		24.33 (3.49)	
Using food as a reward					
PTT	2.2 (0.77)	1.9 (0.56)	−0.50 (−0.90, −0.11) $p = 0.01^*$	2.9 (0.83)	−0.24 (−0.68, 0.21) $p = 0.30$
Control	2.6 (0.74)	2.5 (0.77)		2.7 (0.85)	
Self-efficacy in managing child behaviour					
PTT	3.05 (0.47)	3.32 (0.39)	0.32 (0.04, 0.61) $p = 0.03^*$	3.33 (0.37)	0.16 (0.002, 0.33) $p = 0.05^*$
Control	3.10 (0.45)	3.01 (0.66)		3.12 (0.40)	
Self-efficacy in knowing child's satiety cues					
PTT	3.11 (0.81)	3.40 (0.51)	0.13 (−0.20, 0.47) $p = 0.42$	3.29 (0.64)	0.07 (−0.36, 0.50) $p = 0.74$
Control	2.86 (0.87)	3.16 (0.75)		3.07 (0.89)	
Limiting child's intake of SSBs & snacks					
PTT	3.31 (0.48)	3.34 (0.44)	0.18 (−0.08, 0.44) $p = 0.17$	3.31 (0.44)	0.0 (−0.26, 0.26) $p = 1.0$
Control	3.35 (0.71)	3.18 (0.41)		3.35 (0.53)	
BMI (kg/m ²)					
PTT	16.3 (1.46)	16.3 (1.56)	−0.22 (−0.57, 0.13) $p = 0.21$	16.4 (1.88)	−0.07 (−0.07, 0.58) $p = 0.82$
Control	16.2 (1.36)	16.4 (1.36)		16.3 (1.61)	
Sleep (hours/day)					
PTT	11.2 (0.86)	11.2 (0.80)	0.04 (−0.45, 0.52) $p = 0.88$	12.4 (0.42)	−0.53 (−0.38, 0.27) $p = 0.75$
Control	11.1 (0.82)	11.1 (0.94)		12.4 (0.57)	
TV viewing (hours/day)					
PTT	2.5 (1.16)	2.1 (0.91)	−0.15 (−0.66, 0.34) $p = 0.55$	1.8 (0.61)	−0.25 (−0.67, 0.17) $p = 0.24$
Control	2.1 (0.96)	2.2 (1.1)		2.0 (0.86)	
Active play (minutes/day)					
PTT	88.3 (32.3)	95.7 (23.9)	11.9 (−0.47, 24.18) $p = 0.06$	98.5 (24.0)	10.86 (−2.89, 24.62) $p = 0.12$
Control	86.6 (36.62)	79.3 (30.6)		85.5 (30.7)	
SSB (drinks/day)					
PTT	0.72 (1.08)	0.75 (1.07)	0.43 (−0.07, 0.93) $p = 0.09$	0.93 (1.27)	0.53 (−0.01, 1.09) $p = 0.05$
Control	0.74 (1.54)	0.29 (0.30)		0.35 (0.32)	
NutriSTEP® risk score					
PTT	20.8 (6.90)	17.6 (6.20)	−1.42 (−3.93, 1.10) $p = 0.26$	18.7 (6.22)	0.32 (−2.46, 3.10) $p = 0.82$
Control	21.6 (8.26)	19.4 (7.20)		18.9 (6.76)	

CI, confidence interval; SSB, sugar-sweetened beverage; BMI, body mass index. All models adjusted for child age and sex. * CI does not contain 0, significant at $p < 0.05$ level.

decrease in their use of food as a reward as compared with parents in the control arm ($\hat{\beta} = -0.50$, 95% CI $-0.90, -0.11$, $p = 0.01$). However, this difference was not sustained at 9-month follow-up. We also did not observe an intervention effect for parental ability to follow through on discipline or for self-efficacy in knowing the child's satiety cues.

While changes in the children's activity, sedentary behaviours and overall nutrition risk score were in the desired direction at post-intervention and 9-month follow-up, confidence intervals substantially overlapped zero (Table 5). We did not observe an intervention effect for hours of child sleep/night or SSB consumption at either time point. There was also no significant difference in child BMI between intervention and control groups at post-intervention ($\hat{\beta} = -0.22$, 95% CI $-0.57, 0.13$, $p = 0.21$) or 9-month follow-up ($\hat{\beta} = -0.07$, 95% CI $-0.07, 0.58$, $p = 0.82$).

DISCUSSION

Recent guidelines from the Canadian Task Force on Preventive Health Care regarding the prevention and management of

childhood obesity identified the lack of intervention trials focused on the prevention of excess weight gain in children as a key knowledge gap.³³ To help address this, our pilot study examined the feasibility and acceptability in Canada of a family-based obesity prevention intervention shown to be successful among US families. Our secondary aim was to generate preliminary data on the efficacy of PTT. We found that our study design was feasible for implementation within the community setting and that PTT was acceptable to Canadian parents of preschoolers. Our preliminary impact results suggest that PTT may reduce parental stress and increase parental warmth and self-efficacy but has minimal impact on children's weight and related behaviours.

In this pilot study, we were able to successfully recruit a sufficient number of parents at two of the three OEYCs originally approached (30 parents were recruited at one site and 24 at the other). Our results suggest that in-person recruitment conducted by OEYC centre staff was critical to successful recruitment for our family-based intervention. This finding mirrors that of Ornell-Valente and colleagues, who found that direct recruitment by family coordinators with whom families

had a previous relationship was effective in mobilizing attendance.³⁴ These results highlight the importance of identifying a program champion at each community site who has a relationship with parents and is willing to conduct in-person recruitment in order for a full-scale trial to be effective.

Our attendance rates were high compared with other family-based interventions delivered in community settings.³⁵ As was the case with recruitment, it is possible that having OEYC centre staff whom families trust may have resulted in families feeling a greater responsibility to attend than if they were recruited through other methods. We also provided a meal, child programming and bus fare to reduce barriers to attending; these are strategies identified as effective in increasing parent engagement and retention.³⁶

Another important finding from our pilot study was that the RCT design, using an attention-matched active control focused on a child health issue not related to weight, was feasible and acceptable to parents. Although one family in the control group withdrew because of lack of interest in the topic, retention rates in both study arms were high, suggesting that the randomization process was acceptable; the use of an attention-matched design in our full-scale trial will allow us to rule out the Hawthorne effect. Our results also suggest that our outcome assessment protocol is feasible and acceptable; however, resources should be allocated for home visits to some families to ensure that collection of follow-up data is complete.

This study was not designed as a fully powered trial. However, the results provide preliminary evidence from a comparison with an attention-matched control: PTT resulted in significant improvements in parent-related stress, warmth and self-efficacy in managing child behaviour. Our results are similar to those found in previous full-scale trials of CPP,¹³ suggesting that this Canadian adaption of PTT was sufficient to affect general parenting. However, the results indicate that PTT was not effective at changing children's weight-related behaviours or BMI. Effect estimates for sleep, physical activity, TV viewing and BMI were minimal, suggesting lack of intervention effect rather than lack of power. This lack of effect may indicate that PTT does not adequately address behaviour change related to weight-related behaviours; 35% of program content is specific to these behaviours. Results from the post-intervention survey support this possibility, as 97% of parents reported feeling more confident in managing their children's behaviour at home, whereas only 78% reported feeling more confident in helping their child develop healthy eating habits. Future studies integrating weight-related messages within a general parenting program should explore strategies to ensure that weight-related messages are adequately addressed (e.g., adding more content, talking about weight-related messages at the beginning of the session versus the end, or extending the length of the program). Parent participants may not have been sufficiently primed for the weight-related messages. Formative results suggest that parents have a greater interest in general parenting skills than child nutrition and physical activity; thus, it is possible they were less engaged in the weight-related content. Future implementations of PTT should put a stronger emphasis on our weight-related messages and explore methods by which to

motivate parents to change their child's weight-related behaviours within a prevention context.

When interpreting our results, some limitations should be considered. Because of the self-selection recruitment method, there may be systematic differences between participants and non-participants. Our setting in OEYCs was unique, and the results may not be generalizable to other community-based sites. While we used validated measures wherever possible, the majority of our measures were based on parent report and thus subject to wide variability and possible bias. Future research should explore the use of more objective measures for children's physical activity and sedentary behaviour. Finally, our results may not be generalizable to the entire Canadian population, as the majority of participants identified themselves as being white and fairly well-educated.

CONCLUSION

PTT and the RCT design were feasible and acceptable among Canadian parents. Six months after a 9-week intervention, PTT had had a significant impact on general parenting behaviours, although no significant improvements in weight and weight-related behaviours were obtained. Future interventions that embed weight-related behaviours into a general parenting context should include greater emphasis on weight-related topics to promote and sustain behaviour change among parents of preschoolers.

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RÉSUMÉ

OBJECTIF : Tester la faisabilité, l'acceptabilité et l'impact préliminaire de Parents and Tots Together (PTT), une intervention de prévention de l'obésité menée auprès des familles au Canada.

PARTICIPANTS : Des parents canadiens d'enfants d'âge préscolaire (2–5 ans).

LIEU : Les Centres de la petite enfance du Sud-Ouest de l'Ontario.

INTERVENTION : Un essai pilote comparatif randomisé auprès de 48 parents ayant reçu soit l'intervention PTT ($n = 27$), soit une intervention-témoin sur la sécurité à domicile de même niveau d'attention ($n = 21$). Pour déterminer la faisabilité de PTT, nous avons évalué les taux de conservation des participants et leur taux de réponse aux questionnaires d'évaluation des résultats. Pour déterminer l'acceptabilité, nous avons évalué la fréquentation du programme et les réponses des parents aux sondages sur leur satisfaction par rapport au programme. Pour déterminer l'impact préliminaire, nous avons évalué l'indice de masse corporelle (IMC) des enfants au départ, après l'intervention (au bout de 9 semaines) et lors du suivi après 9 mois. De plus, à chaque étape, les parents ont rempli des questionnaires évaluant leur stress et leur auto-efficacité liés à leur rôle parental et au sommeil, à l'activité, à l'écoute de la télévision et au régime des enfants.

EFFETS : Les taux de conservation ont été élevés pour l'intervention (93 %) et pour l'étude témoin (84 %), et 87 % des parents ont déclaré qu'ils recommanderaient vivement le programme PTT à un ami. Au suivi après 9 mois, comparativement aux parents témoins, les parents de l'intervention ont fait état d'un stress moins élevé lié au rôle parental ($\beta = 15,83$, intervalle de confiance [IC] de 95 % : $-29,57$, $-2,07$, $p = 0,02$) et d'une auto-efficacité plus élevée dans la gestion du comportement de leur enfant ($\beta = 0,16$, IC de 95 % : $0,002$, $0,33$, $p = 0,05$). Le programme PTT n'a eu qu'une influence minime sur les comportements liés au poids et sur l'IMC des enfants.

CONCLUSIONS : Les résultats montrent qu'il est faisable de mettre en œuvre et de tester le programme PTT dans le contexte canadien. Les résultats sur l'impact préliminaire montrent que le programme peut être efficace pour changer les compétences parentales en général, mais qu'il faudrait en modifier le contenu pour aborder convenablement les comportements liés au poids chez les enfants.

MOTS CLÉS : enfance; prévention de l'obésité; intervention familiale