A brief eHealth tool delivered in primary care to help parents prevent childhood obesity: a randomized controlled trial

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Summary

Objectives: To determine the feasibility and preliminary impact of an electronic health (eHealth) screening, brief intervention and referral to treatment (SBIRT) delivered in primary care to help parents prevent childhood obesity.

Methods: Parents of children (5–17 years) were recruited from a primary care clinic. Children’s measured height and weight were entered into the SBIRT on a study-designated tablet. The SBIRT screened for children’s weight status, block randomized parents to one of four brief interventions or an eHealth control and provided parents with a menu of optional obesity prevention resources. Feasibility was determined by parents’ interest in, and uptake of, the SBIRT. Preliminary impact was based on parents’ concern about children’s weight status and intention to change lifestyle behaviours post-SBIRT.

Results: Parents (n = 226) of children (9.9 ± 3.4 years) were primarily biological mothers (87.6%) and Caucasian (70.4%). The proportion of participants recruited (84.3%) along with parents who selected optional resources within the SBIRT (85.8%) supported feasibility. Secondary outcomes did not vary across groups, but non-Caucasian parents classified as inaccurate estimators of children’s weight status reported higher levels of concern and intention to change post-SBIRT.

Conclusions: Our innovative, eHealth SBIRT was feasible in primary care and has the potential to encourage parents of unhealthy weight children towards preventative action.

Keywords: Child, eHealth, obesity prevention, primary care.

Abbreviations: eHealth, electronic health; SBIRT, screening, brief intervention and referral to treatment; RCT, randomized controlled trial; RIPPLE, Resource Information Program for Parents on Lifestyle and Education; BMI, body mass index; I, injunctive; N, normative

Introduction

There is evidence to support targeting parents to prevent unhealthy weight gain in children (1). Parents can foster a supportive home environment, role-model healthy lifestyle habits and monitor and reinforce children’s lifestyle behaviours (2). Yet, a substantial proportion of parents inaccurately estimate children’s weight status and many do not perceive their children’s excess weight as a health concern (3), which may impede or delay preventive actions (4). Further, among those parents who are accurate estimators of their children’s weight status, only 50–60% are likely to encourage healthy lifestyle behaviours for their children (5). These data highlight the need to develop and test novel approaches designed to help parents support children’s healthy weights.

Digital technologies, such as eHealth (electronic health) applications, have several capabilities and characteristics that are amenable to research in the healthcare setting. For instance, they have the potential to increase access to services (6), reduce social barriers and provide anonymity to patients (7), and alleviate challenges (e.g. lack of time and resources) that primary care providers often report when
delivering prevention-related care (8). Digital technologies may be well suited to preventing childhood obesity because they can enhance the speed of delivery and convenience of limited obesity-related health services (9). Further, recent studies (10,11) have shown that parents are receptive to the use of technology to facilitate positive health behaviour change. Although reviews have reinforced the advantages of digital health applications for children and families (7,12), most have been time and resource-intensive (13) and little is known about brief and novel strategies to prevent childhood obesity.

One such approach is the eHealth screening, brief intervention and referral to treatment (SBIRT), which has been applied in primary care to prevent and screen for substance abuse (14) and mental health concerns (15). SBIRTs can be delivered electronically, and studies have shown that this approach can exert a positive influence on intention to change unhealthy habits and potentially behaviour change itself (14). In childhood obesity, SBIRTs align with preventive health services since they can be designed to screen for children’s weight status, a clinical practice that is recommended (16), but difficult to implement (17). Accordingly, the objective of our study was to conduct a pilot randomized controlled trial (RCT) to determine the feasibility (primary outcome) and preliminary impact (secondary outcome) of a parent-based SBIRT designed to prevent childhood obesity in primary care.

**Methods**

**Participants and recruitment**

Eligible parents of children were recruited from the waiting room of a paediatric primary care clinic between July to October 2015; parents were invited by the study coordinator (J. B.) or research assistant (N. B.) to participate in the brief eHealth tool on a study-designated tablet. Parents awaiting their child’s upcoming paediatrician appointment were eligible to participate if (i) their child (5–17 years) presented with non-urgent medical issues; (ii) they self-identified as the child’s primary caregiver (e.g. mothers, fathers and legal guardians) and (iii) they were able to read and speak English fluently. Families typically waited a period of time before their medical appointments started, and this time was used to (i) coordinate with the intake nurse to identify eligible families; (ii) recruit participants; (iii) obtain informed; written consent (adult) and assent (child); (iv) measure and record children’s height (cm) and weight (kg) and (v) deliver the SBIRT to parents on a study-designated tablet. From start to finish, this process took approximately ~20 min. Parents received a token of appreciation ($25 CAD gift card) upon completion of the SBIRT, and at that time, they were encouraged to participate in a 1-month follow-up survey. The Health Research Ethics Board at the University of Alberta (Edmonton, AB) reviewed and approved this study.

**Study design**

The protocol for this study has been published (18), and the trial is registered (ClinicalTrials.gov, Identifier: NCT02330588).

**Intervention type**

Content and flow of the SBIRT, entitled the Resource Information Program for Parents on Lifestyle and Education (RIPPLE), are shown in Fig. S1 in the Supporting Information. The SBIRT was delivered on a study-designated tablet and included the following components.

**Data input.** Within the paediatric primary care clinic, medical office assistants measured children’s height (to the nearest 0.1 cm) by using an electronic stadiometer and weight (to the nearest 0.1 kg) by using a medical scale, which was part of the routine clinical process. Anthropometric data were entered into the SBIRT on a study-designated tablet and given to parents to enter (i) demographic data (e.g. ethnicity and socioeconomic status); (ii) perception of their child’s weight status (i.e. very underweight, a little underweight, just right, a little overweight and very overweight) and (iii) contact information (i.e. email).

**Screening.** Using children’s height and weight data, sex-specific and age-specific body mass index (BMI; kg m$^{-2}$) percentile and weight status categories were automatically calculated according to reference values of the Centers for Disease Control and Prevention (19): underweight (BMI <5th percentile), healthy weight (≥5th and <85th percentiles), unhealthy weight (≥85th and <95th percentiles) and very unhealthy weight (≥95th percentile). Parents received this information both numerically and visually by using a weight ruler (Fig. S2a) (20).

**Brief intervention.** Parents were randomly assigned to one of four brief interventions or the eHealth control group. Two of the brief interventions were nutrition-based (Eat it!) and two were physical-activity (Move it!) based. The nutrition-based interventions included two questions about portion
 Brief eHealth tool to prevent obesity

Menu of resources (referral to treatment). Parents were presented with a menu of resources, which constituted online handouts (e.g. physical activity and sedentary behaviour guidelines and tips on healthy snacking) and information on community services (e.g. dietitian counselling and paediatric weight management services) that were compiled by our grant team and primary care-based research partners. Information on community services were focused on parents of children classified as overweight or obese for weight management purposes. Parents were given the option to select as many handouts and/or services as desired; a total of 14 online handouts and six community services were provided (Fig. S2d).

Survey. A brief survey (21) was adapted (with permission) to assess parents’ concern about children’s weight status and intention to change children’s lifestyle behaviour post-SBIRT. To assess concern, parents were asked ‘How concerned are you about your child’s present weight or body size?’ (0 = not concerned; 4 = very concerned). To assess intention to change children’s diet (for Eat It! and Heads Up!) or physical activity (for Move It! and Heads Up!), parents were asked either, ‘How ready are you to change your child’s eating habits?’ or ‘How ready are you to change your child’s level of physical activity?’ (0 = not ready; 4 = very ready), respectively, using a 5-point Likert scale.

Tailored email report. Parents were provided with the option to receive an automatically generated tailored report to their personal email. The report included (i) children’s weight status; (ii) parents’ responses to and feedback from the brief intervention (or information from the eHealth control) and the resources they selected. The report also reminded parents that they would receive a brief, follow-up survey in 1 month, which assessed (i) their use of selected obesity prevention resources and (ii) if they discussed their child’s weight at the paediatician appointment immediately following the SBIRT.

Trial procedures

Participants enrolled in this double-blinded, parallel-design RCT were automatically assigned a unique, non-identifying number. The allocation sequence was electronically generated within the SBIRT, and parents were assigned to one of the four intervention groups or the eHealth control by using blocked randomization (five arms, block size of five) to ensure equal group sizes (n = 45/arm, equal allocation ratio of 1:1). Research personnel were blinded to participants’ intervention assignments unless participants asked for assistance (n = 11). Participants were also blinded; prior to enrolment, participants received information that was sufficient to obtain informed consent, but inadequate so as to decipher between group assignment.

Outcomes and measurement

Our primary outcome was feasibility of the SBIRT, which included parents’ interest in, and uptake of, the SBIRT. Parents’ interest was determined by the proportion of parents that (i) enrolled among those approached to participate; (ii) ‘opted in’ to receive the tailored email report and (iii) self-selected resources from the SBIRT; the latter two were recorded by back-end programming of the SBIRT. Uptake was determined by parents’ use (actual and self-reported) of obesity prevention resources and the proportion of parents that reported discussing children’s weight with their paediatrician immediately following the SBIRT. Parents’ actual use of resources was also determined via back-end programming of the SBIRT; links to selected resources were included in the optional tailored email, and we were able to determine if resources were downloaded by parents. At 1-month post-SBIRT, parents were emailed a brief follow-up survey that asked: ‘Over the past month, did you use the online resources that you selected during the RIPPLE programme?’ and ‘I discussed my child’s weight with the paediatrician last month when I completed the RIPPLE programme.’ (0 = yes; 1 = no).
Secondary outcomes informed preliminary impact of the SBIRT and included parents’ concern about children’s weight status and intention to change children’s lifestyle behaviours immediately following the SBIRT (see ‘Survey’ component of the intervention for measurement).

Statistical analyses
Continuous and categorical variables were summarized descriptively using means (SD) and proportions. Group differences by weight status, demographic characteristics and primary and secondary outcomes were assessed by using independent sample t-tests and one-way ANOVA with Tukey adjustments for post hoc analysis (continuous variables), and chi-squared analysis (categorical variables). Spearman’s rho was used for non-parametric correlations. Children’s age-adjusted and sex-adjusted BMI percentiles were calculated according to the Centers for Disease Control and Prevention (2000); for analyses purposes, children were classified as having a healthy (BMI ≥5th and <85th percentiles) or unhealthy weight (≥85th and <95th percentiles or ≥95th percentile).1 Parents were classified as accurate or inaccurate estimators based on the concordance between their perception of children’s weight status and children’s measured weight status. Analyses were performed by using SPSS version 22.0 (SPSS Inc., Chicago, Illinois), and EPIINFO7 (Centers for Disease Control and Prevention, Atlanta, Georgia) was used to calculate BMI z-score. \( P < 0.05 \) was considered statistically significant.

Results
Demographic and anthropometric characteristics of participants did not differ across groups (Table 1). Based on measured height and weight data, children (9.9 ± 3.4 years; 50.9% male participants) were classified as underweight (5.8%), healthy weight (61.7%), overweight (16.4%) or obese (10.6%); mean BMI z-score was 0.4 ± 1.1. Compared with children with an unhealthy weight (i.e. overweight and obese), more healthy weight children had parents who were married (61.7% vs. 79.3%; \( \chi^2 = 7.2, \ p = 0.007 \)), Caucasian (59.0% vs. 74.5%; \( \chi^2 = 5.1, \ p = 0.02 \)) and with a post-secondary education (36.1% vs. 54.2%; \( \chi^2 = 5.9, \ p = 0.02 \)). One-third \((n = 76; 33.6\%)\) of parents were inaccurate estimators of their children’s weight status; most \((n = 69; 90.8\%)\) underestimated children’s weight status, the majority \((n = 48; 70.0\%)\) with unhealthy weight children.

Primary outcomes
A total of 226 participants were recruited from July to October 2015 (Fig. 1). Figure 2 shows the proportion of parents across all primary outcomes, which did not differ across study groups; however, parents assigned to the brief intervention groups were less likely to select resources compared with the eHealth control group \(\chi^2 = 4.8; \ p = 0.03\).

Most parents selected resources (85.8%; 194/226); of these, parents selected online handouts (76/194; 39.2%), information on community services (5/194; 2.6%) or both (113/194; 58.2%). On average, parents selected six resources (mean: 6.4 ± 4.8; range: 0–20); the top-three commonly selected resources included handouts on sleeping \((n = 139; 71.6\%)\), snacking \((n = 112; 57.7\%)\) and positive body image \((n = 108; 55.7\%)\). There was a positive correlation between the number of resources selected by parents and (i) their reported levels of concern about their children’s weight \((r = 0.25; \ p < 0.001)\) and intention to change lifestyle behaviours \((r = 0.20; \ p = 0.002)\), and (ii) children’s BMI z-score \((r = 0.19; \ p = 0.003)\). Parents who selected (vs. did not select) resources differed by children’s BMI z-score (0.5 ± 1.1 vs. \(-0.04 ± 1.1; \ p = 0.02\)) and intention to change lifestyle behaviours \((2.6 ± 1.2 vs. 2.0 ± 1.5; \ p = 0.01)\).

Approximately 60% of parents completed the 1-month follow-up email survey; parents \((n = 136)\) who completed the follow-up survey were more likely to be married (vs. not married) compared with parents who did not complete the survey (65.3% vs. 42.1%; \(\chi^2 = 5.7, \ p = 0.02\)). At follow-up, parents who reported discussing (vs. not discussing) children’s weight status with the paediatrician differed by children’s BMI z-score (0.5 ± 1.2 vs. 0.2 ± 0.9; \(\ p = 0.03\)) and baseline concern for child’s weight status \((1.1 ± 1.4 vs. 0.4 ± 0.8; \ p = 0.001)\). Discussion of weight also differed by children’s weight status (unhealthy vs. healthy weight [80.6% vs. 42.4%; \(\chi^2 = 15.4, \ p < 0.001\]) as well as parents’ education level (high school vs. post-secondary [61.5% vs. 44.3%; \(\chi^2 = 4.0, \ p = 0.045\]) and estimation accuracy of children’s weight status prior to screening (accurate vs. inaccurate [44.4% vs. 68.9%; \(\chi^2 = 7.2, \ p = 0.007\)].

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1Although underweight children may also be considered ‘unhealthy’, for the purpose of this report, children who were underweight (BMI <5th percentile) were not included in the unhealthy weight category.
Table 1  Demographic and anthropometric characteristics of parents and children

<table>
<thead>
<tr>
<th></th>
<th>Intervention or Control Group*</th>
<th>Mean ± standard deviation (95%CI) for continuous variables; n(%) for categorical variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (n = 226)</td>
<td>Move It [I] (n = 46) Move It [N] (n = 46) Eat It [I] (n = 44) Eat It [N] (n = 43) eHealth control (n = 47)</td>
</tr>
<tr>
<td><strong>Parent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>28 (12.4%) 4 (8.7%) 9 (19.6%) 5 (11.4%) 5 (11.6%) 5 (10.6%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>196 (86.7%) 42 (91.3%) 37 (80.4%) 39 (88.6%) 38 (88.4%) 42 (89.4%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian</td>
<td>159 (70.4%) 33 (71.7%) 33 (71.7%) 28 (63.6%) 32 (74.4%) 33 (70.2%)</td>
</tr>
<tr>
<td></td>
<td>Non-Caucasian</td>
<td>67 (29.6%) 13 (28.3%) 13 (28.3%) 16 (36.4%) 11 (25.6%) 14 (29.8%)</td>
</tr>
<tr>
<td>Education level†</td>
<td>High school</td>
<td>114 (50.7%) 22 (47.8%) 22 (48.9%) 21 (47.7%) 23 (53.5%) 26 (55.3%)</td>
</tr>
<tr>
<td></td>
<td>Post-secondary</td>
<td>111 (49.3%) 24 (52.2%) 23 (51.1%) 23 (52.3%) 20 (46.5%) 21 (44.7%)</td>
</tr>
<tr>
<td>Relationship status‡</td>
<td>Married</td>
<td>167 (74.6%) 38 (82.6%) 36 (80.0%) 29 (65.9%) 33 (76.7%) 31 (67.4%)</td>
</tr>
<tr>
<td></td>
<td>Not married</td>
<td>57 (25.4%) 8 (17.4%) 9 (20.0%) 15 (34.1%) 10 (23.3%) 15 (32.6%)</td>
</tr>
<tr>
<td>Household income§</td>
<td>≤$60 000</td>
<td>74 (35.2%) 18 (40.0%) 12 (27.3%) 15 (36.6%) 12 (30.8%) 17 (41.5%)</td>
</tr>
<tr>
<td></td>
<td>&gt;$60 000</td>
<td>136 (64.8%) 27 (60.0%) 32 (72.7%) 26 (63.4%) 27 (69.2%) 24 (58.5%)</td>
</tr>
<tr>
<td><strong>Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>115 (50.9%) 30 (65.2%) 25 (54.3%) 20 (45.5%) 23 (53.5%) 17 (36.2%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>111 (49.1%) 16 (34.8%) 21 (45.7%) 23 (52.3%) 20 (46.5%) 21 (44.7%)</td>
</tr>
<tr>
<td>Age (year)</td>
<td>9.9 ± 3.4 (9.4–10.3)</td>
<td>10.3 ± 3.9 (9.1–11.4) 9.6 ± 3.5 (8.5–10.6) 9.8 ± 3.6 (8.6–10.9) 9.7 ± 3.2 (8.7–10.6) 10.2 ± 2.9 (9.3–11.1)</td>
</tr>
<tr>
<td>Age category</td>
<td>Child (5–12 years)</td>
<td>175 (77.4%) 31 (67.4%) 37 (80.4%) 34 (77.3%) 36 (83.7%) 37 (78.7%)</td>
</tr>
<tr>
<td></td>
<td>Adolescent</td>
<td>51 (22.6%) 15 (32.6%) 9 (19.6%) 10 (22.7%) 7 (16.3%) 10 (21.3%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian</td>
<td>168 (74.3%) 33 (71.7%) 35 (76.1%) 32 (72.7%) 36 (83.7%) 32 (68.1%)</td>
</tr>
<tr>
<td></td>
<td>Non-Caucasian</td>
<td>58 (25.7%) 13 (28.3%) 11 (23.9%) 12 (27.3%) 7 (16.3%) 15 (21.9%)</td>
</tr>
<tr>
<td>Body mass index (BMI; kg m$^{-2}$)</td>
<td>18.8 ± 4.7 (18.2–19.4)</td>
<td>17.9 ± 3.6 (16.8–18.9) 18.1 ± 3.1 (17.2–19.0) 19.1 ± 3.9 (17.3–20.3) 19.4 ± 6.9 (17.3–21.5) 19.5 ± 5.1 (18.0–21.0)</td>
</tr>
<tr>
<td>BMI percentile</td>
<td>60.5 ± 29.4 (56.6–64.4)</td>
<td>50.9 ± 29.9 (42.0–59.8) 61.2 ± 27.4 (53.1–69.3) 64.7 ± 31.1 (55.2–74.2) 59.4 ± 29.5 (50.4–68.5) 66.2 ± 27.9 (58.1–74.4)</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>0.4 ± 1.1 (0.3–0.5)</td>
<td>0.04 ± 1.1 (0.3–0.4) 0.4 ± 0.9 (0.1–0.6) 0.7 ± 1.1 (0.3–1.0) 0.4 ± 1.1 (0.04–0.7) 0.6 ± 1.2 (0.2–0.9)</td>
</tr>
<tr>
<td>Weight status**</td>
<td>Healthy weight</td>
<td>152 (71.4%) 34 (85.0%) 32 (71.1%) 24 (57.1%) 29 (70.7%) 33 (73.3%)</td>
</tr>
<tr>
<td></td>
<td>Overweight/obese</td>
<td>61 (28.6%) 6 (15.0%) 13 (29.9%) 18 (42.9%) 12 (29.3%) 12 (26.7%)</td>
</tr>
</tbody>
</table>

*All group comparisons p > 0.05.
†Missing data; total (n = 225), Move It [N] (n = 45).
‡Missing data; total (n = 224), Move It [N] (n = 45), Control (n = 46).
§Missing data; total (n = 210), Move It [I] (n = 45), Move It [N] (n = 44), Eat It [I] (n = 41), Eat It [N] (n = 39), Control (n = 41).
**Cases excluded (i.e. children classified as underweight); total (n = 213), Move It [I] (n = 40), Move It [N] (n = 45), Eat It [I] (n = 42), Eat It [N] (n = 41), Control (n = 45).
Secondary outcomes

Parental concern about children’s weight status and intention to change children’s lifestyle behaviours did not differ across brief intervention or eHealth control groups. However, children’s demographic and anthropometric characteristics, and parents’ ethnicity and weight status estimation data varied by parental concern and intention to change (Table S1 in the Supporting Information); non-Caucasian (vs. Caucasian) parents as well as those classified as inaccurate (vs. accurate) estimators of children’s weight status reported higher levels of concern about their children’s weight status post-SBIRT (1.1 ± 1.4 vs. 0.6 ± 1.0, \( p = 0.005 \); 1.2 ± 1.3 vs. 0.5 ± 1.0, \( p < 0.001 \), respectively). Similarly, parents of children classified as overweight or obese reported higher levels of concern and intention to change compared with their healthy weight counterparts \( (p < 0.001) \). Compared with parents less ready for change, parents who ‘strongly agreed’ that they were ready to change children’s lifestyle behaviours were more likely to have children with an unhealthy weight \( (\chi^2 = 11.0; p = 0.001) \) and be classified as inaccurate estimators of children’s weight status \( (\chi^2 = 5.1; p = 0.02) \).

Discussion

Our newly developed, parent-based SBIRT designed to help prevent childhood obesity was feasible in the primary care setting. Parents that selected resources during the SBIRT and reported discussing their children’s weight with the paediatrician tended to have
heavier children, suggesting the eHealth tool may nudge parents who are at risk for having children with obesity towards behaviour change.

To our knowledge, RIPPLE represents the first parent-based SBIRT designed to prevent childhood obesity in primary care. Similar to other recent reports (22), our SBIRT was feasible to integrate into the day-to-day activities of a busy clinical setting. Of those invited to participate, nearly 85% were enrolled, a finding consistent with the upper end of recruitment proportions (i.e. 50–85%) reported by other studies that have tested SBIRTs in primary care (23–25). In addition, a high proportion of parents selected resources during the SBIRT, with commonly selected ones representing topics that may not typically arise in the context of obesity prevention (e.g. positive body image and sleep habits). Notably, nearly all of the participants assigned to the eHealth control group selected resources compared with 80% in the brief intervention groups. This suggests that weight screening and the provision of information on children’s healthy lifestyle behaviours may optimally impact parents. Lastly, although parents’ willingness and interest to participate in the novel eHealth tool was evident, uptake of resources was limited – a finding consistent with others that have demonstrated the minimal long-term impact of SBIRTs in primary care (26,27). This highlights that while the eHealth tool may nudge parents towards preventive action, additional resources to impact health outcomes beyond the short-term are warranted.

There is evidence to support future research and application of our SBIRT. First, parents with heavier children and those families characterized by factors associated with obesity in children (e.g. misperception of children’s weight status (28) may have been positively impacted by the SBIRT. Specifically, parents with heavier children who were classified as inaccurate estimators of children’s weight status, as well as parents with lower levels of education, were more likely to report discussing their child’s weight with the paediatrician. This evidence suggests that the SBIRT may act as a catalyst for parents to initiate a discussion about children’s weight status with their paediatrician. Second, compared with their Caucasian counterparts, non-Caucasian parents who underestimated their children’s weight status reported greater levels of concern about children’s weight status and intention to change lifestyle behaviours following the SBIRT. Although these constructs were not measured pre-SBIRT and post-SBIRT, parents reported high levels of intention to change following the SBIRT, a finding that contrasts with reports that have characterized inaccurate weight estimators as less likely to intend to change compared with their accurate peers (29). As such, we speculate that the SBIRT might influence psychological precursors to behaviour change (30), particularly among parents of children who might be at greatest risk for obesity.

Limitations
First, our SBIRT was brief and did not include data collection of parents’ self-reported concern and intention pre-intervention and post-intervention. It is possible that those parents who reported high levels of concern and intention to change post-SBIRT might have felt this way prior to the study. Although we can
speculate that the SBIRT might positively impact parents of children at risk for obesity, this interpretation must be made with caution; concerns about children’s weight status and intention to change lifestyle behaviors are complex constructs to measure. In comparing our findings to previous studies (29), our measurement of these constructs differed in terms of when (e.g. before or after presentation of children’s weight status) and how (e.g. 5-point Likert scale) they were measured. Second, we aimed to measure parents’ objective use of self-selected resources by using the back-end programming functionality available through the tailored email report. However, we may have underestimated the impact of our SBIRT if parents accessed resources related to obesity prevention through alternative means (e.g. web-searching). Lastly, the nature of this developmental study was to determine feasibility of the SBIRT, and it was not sufficiently powered to specifically detect group differences with respect to secondary outcomes.

Conclusions

Our novel, parent-based SBIRT screened children’s weight status, delivered a brief intervention or eHealth control on children’s healthy lifestyle behaviours and provided a menu of resources to facilitate obesity prevention in children. Parents’ interest to participate in the SBIRT supported feasibility in primary care, with a large proportion of participants, particularly those with heavier children, selecting resources during the SBIRT. Parents of children with overweight and obesity were also more likely to report discussing their children’s weight status with the paediatrician. Together, our data suggest that this eHealth tool has the potential to encourage parents towards preventative action. Findings from this pilot RCT will be used to inform the development of a larger-scale evaluation of our SBIRT across multiple primary care-based settings.

Conflict of Interest Statement

No conflict of interest was declared.

Acknowledgements

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References


**Supporting information**

Additional Supporting Information may be found in the online version of this article at the publisher’s web-site:

*Figure S1*. Flow of the SBIRT.

*Figure S2a*. An example of the feedback received by parents during the screening phase of the SBIRT.

*Figure S2b*. An example of the normative feedback received by parents during the brief intervention phase of the eHealth tool (Move It! only).

*Figure S2c*. Information provided to parents in the eHealth control group.

*Figure S2d*. An example of the menu of optional resources (i.e. online handouts and information on community services) presented to parents in the SBIRT.

**Table S1**. Differences across secondary outcome variables by demographic and anthropometric characteristics.