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A Coaching and/or Education Intervention Targeting Physical Activity and Nutrition Behaviours in Parents with Overweight/ obesity and their Children

Shazya Karmali, *The University of Western Ontario*

Supervisor: Dr. Jennifer D. Irwin, *The University of Western Ontario*

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Abstract

The purpose of this dissertation is to provide a detailed overview of, findings from, and experiences participating in a 3-month randomized controlled trial (RCT) targeting obesity-related behaviours in parents with overweight/obesity (body mass index [BMI] ≥ 25 kg/m^2) and their children (2.5-10 years old, any weight; N = 50 dyads). A concurrent mixed methods study comprised of an RCT and descriptive qualitative design was utilized. Parent-participants received Co-Active Life Coaching (CALC) and webinar-based health education (intervention) or education only (control). To address the dissertation's purpose, **Chapter II** provides a detailed methodological account of the program, including rationale and a description of utilized measures. **Chapter III** depicts a study exploring the impact of the program on the primary outcomes of physical activity (PA) and dietary intake of parents and children, parental motivation to engage in healthy behaviours, and parental perceptions of program improvements. To determine anthropometric impacts, parental BMI and waist circumference were included. Quantitative results were not statistically significant; however, decrease in sodium intake in intervention group parents showed a trend toward significance (p = 0.04) from baseline to 6-month follow-up. Qualitatively, parents in both groups reported increased awareness of health behaviours, diet and PA improvements, and positive program experiences. Some parents felt the webinars were reminders about healthy habits, whereas others felt the information was new and important. Finally, to understand both client *and* coach perspectives, and what might be needed to maximize this behaviour change approach, **Chapter IV** presents a qualitative exploration of the experiences of parents and coaches in the intervention group. Parents reported increased accountability for their behaviours, learning how to effectively set goals, working through root causes of their behaviours, and changing their perspectives. Coaches provided information on

tools/techniques they most commonly used, insights into working with this population, and advice for future coaches. The findings from this study will allow researchers, coaches, and participants to better understand the foundations for a strong coaching partnership in the context of obesity-related health behaviour changes. Together, these chapters represent the first (to the researchers' knowledge) CALC and/or health education intervention for parents with overweight/obesity and their children.

Keywords: Co-Active Life Coaching, Obesity, Lifestyle Intervention, Parent-Child, Physical Activity, Nutrition

Summary for Lay Audience

Obesity – which may cause physical, emotional, economical, and social complications – is linked with eating high-fat and high-sugar foods, and physical inactivity. Obesity developed during childhood can produce lifelong difficulties (e.g. poor self-esteem, heart diseases, type-2 diabetes). Because children learn through observation, parents and the home environment are important in shaping children's health: parents model and promote healthy behaviours to their children. Therefore, the purpose of this dissertation was to provide an overview of, findings from, and experiences of parents with overweight/obesity (and their children, ages 2.5-10, of any weight) participating in a 3-month program targeting physical activity (PA) and nutrition behaviours. Fifty parent-child pairs were recruited and randomly assigned to an intervention group (coaching and webinar-based health education sessions) or a control group (health education sessions only). **Chapter II** details the methods used for this research. **Chapter III** explains the program's impact on PA and dietary intake of parents and children, parental motivation to engage in healthy behaviours, and parental perceptions of program improvements. To understand changes in parental body composition over the duration of this program, height, weight, and waist-circumference were measured. Based on numerical data, there were no meaningful changes or differences in behaviours between groups or over time. In-person interviews revealed that parents in both groups reported increased awareness of health behaviours, improvements in diet and PA, and positive program experiences. Some parents felt the webinars reminded them about healthy living; others felt the information was relevant, which led to behaviour changes. Parents who received coaching, and their coaches, were interviewed to better understand their experiences in the program, as well as how best to design future obesity-targeted programs. **Chapter IV** outlines these perspectives: Parents reported feeling accountable,

learned goal-setting, addressed root causes of their behaviours, and changed their perspectives. Coaches outlined commonly used tools/techniques, insights about this population, and advice for future coaches. Findings from this study will teach researchers, coaches, and participants about what supports a strong coach-client relationship, which may result in behaviour change; and to the researchers' knowledge, is the first to evaluate coaching and/or education on parents with overweight/obesity and their children.

Co-Authorship

The material presented in this dissertation is my original work. I would, however, like to acknowledge the essential contributions of my co-authors, and thank them for their continuous guidance, feedback, and support with regard to the completion of this research. Thank you to Drs. Danielle Battram, Shauna Burke, Anita Cramp, Tara Mantler, Don Morrow, Victor Ng, Erin Pearson, Robert Petrella, and Trish Tucker for providing me with valuable and constructive revisions and feedback throughout my research program. A very big thank you to Dr. Andrew Johnson for his assistance with statistical analyses. Last, but not least, thank you to my supervisor and mentor, Dr. Jennifer Irwin, who played an integral role in creating and executing this study and associated manuscripts.

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Dedication

I would like to dedicate this dissertation to the memories of my grandparents – Mama, Papa, and Dadima – for always believing in me and pushing me to strive for the best. Also, to my parents and brother for supporting me in everything I do.

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List of Abbreviations

Abbreviation	Meaning
AM	Autonomous Motivation
BMI	Body Mass Index
CALC	Co-Active Life Coaching
CDC	Centers for Disease Control and Prevention
CPCC	Certified Professional Co-Active Coach
CSEP	Canadian Society for Exercise Physiology
CVD	Cardiovascular Disease
CTI	Coaches' Training Institute
ESES	Eating Self-Efficacy Scale
GSE	Generalized Self-Efficacy (Scale)
IPAQ	International Physical Activity Questionnaire
LICO	Low-Income Cut Off
MSPSS	Multidimensional Scale of Perceived Social Support
MVPA	Moderate-to-Vigorous Physical Activity
PA	Physical Activity
PHAC	Public Health Agency of Canada
RCT	Randomized Controlled Trial
RSE	Rosenberg Self-Esteem Scale
SF-36	Short-Form 36
StatCan	Statistics Canada
TSRQ	Treatment Self-Regulation Questionnaire
WEL-Q	Weight Efficacy Lifestyle Questionnaire

WHO	World Health Organization

Chapter I: Introduction, Rationale, and Purpose Statement

Preface

This dissertation research program focused on exploring the impact of Co-Active Life Coaching (CALC) and/or health education on parents with overweight/obesity and their children (ages 2.5-10, of any weight). This introductory chapter provides background information on the rationale for conducting this dissertation, including: (a) the definition of obesity; (b) the implications of obesity on adults, children, and the healthcare system; (c) obesity and the family unit; (d) family-based obesity prevention/treatment interventions; (e) targeting obesity via CALC; and (f) the importance of assessing participant and interventionist perspectives.

The overall objective of this program of research followed by the purpose of the dissertation document are then presented. An integrated-article format was adopted for this dissertation. Thus, some material from the following introduction will be repeated in subsequent chapters.

Obesity

Obesity and overweight (i.e., excessive fat accumulation that may impair health; World Health Organization [WHO], 2019) is commonly measured in adults by using body mass index (BMI), which is a person's weight in kilograms divided by the square of their height in metres (kg/m^2). Adults who have a BMI greater than or equal to 25 kg/m^2 are considered as overweight, and those who have a BMI of 30 kg/m^2 are classified as obese.

In Canada, 26.8% of adults 18 and older (approximately 7.3 million adults) are considered as obese, and another 36.3 % (roughly 9.9 million adults) have overweight. One in seven Canadian children and youth have obesity (defined as having a BMI at or above the 95^{th} percentile for children and teens of the same age and sex; Centers for Disease Control and

Prevention [CDC], 2018; Rao, Kropac, Do, Roberts, & Jayaraman, 2016). Childhood obesity often persists into adulthood (Rao et al., 2016); thus, it is vital to develop healthy behaviours from a young age. Obesity/overweight are caused by behaviours such as high consumption of energy-dense foods, insufficient physical activity, and high levels of sedentary behaviour (WHO, 2019). Social determinants of health, such as genetics and environment, also contribute to the development of overweight/obesity. For instance, low socioeconomic status has been positively associated with obesity (O'Dea, 2008). This is often because unhealthy foods are less expensive than healthy foods, or sometimes, healthy foods are not accessible (Ogilvie & Eggleton, 2016). These challenges to accessing healthy foods are reflective, in part, of changes in the food environment, in which convenience and fast foods have become increasingly readily available (Ogilvie & Eggleton, 2016). In addition, changes in society and the overall home environment, such as the increased use of technology and greater screen time, have resulted in physical activity being replaced by more sedentary pursuits (Bounajm, Dinh, & Theriault, 2014; Epstein, Paluch, Roemmich, & Beecher, 2007). An excess of obesity-promoting behaviours and obesogenic environments have resulted in more of the population suffering from associated illnesses and needing care at all ages.

Implications of Obesity on Adults, Children, and the Healthcare System

There are many health and social implications associated with obesity. The comorbidities associated with obesity include diabetes, cardiovascular disease, sleep apnea, asthma, and depression, to name a few (WHO, 2019). These conditions are now being diagnosed in younger populations than previously observed due to higher incidences of obesity in these age groups (Ogilvie & Eggleton, 2016). It has been reported that obesity-related diseases are responsible for 1 in 10 premature deaths in Canadians aged 20-64 years (Ogilvie & Eggleton, 2016). Socially,

individuals with obesity also often face stigmatization (e.g. discrimination, social rejection, bullying), which can negatively impact their mental health (Tronieri, Wurst, Pearl, & Allison, 2017). Oftentimes, this stigmatization gets internalized, leading to low self-esteem and negative weight-related beliefs and attitudes (Tronieri et al., 2017). Related to the social-emotional implications of obesity, it is also associated with an increased risk of developing clinical depression (Tronieri et al., 2017). The interconnectedness between depression and obesity is insidious, given that depression among people of any weight is associated with an increased risk of weight gain and onset of obesity (Tronieri et al., 2017). Therefore, addressing overall mental health is an important step toward reducing obesity.

In addition to the personal toll it takes, obesity also has many economic implications. Costs of treatment and management of chronic diseases resulting from obesity and obesity-promoting behaviours, as well as productivity losses, severely tax the Canadian economy and healthcare system (Ekwaru et al., 2016). Many of these costs are avoidable through the promotion and consequent uptake of healthy behaviours, government and industry support, and funding for obesity prevention programs (Ekwaru et al., 2016). Canada's economic burden (i.e., direct and indirect costs) of physical inactivity, excess body weight, and inadequate consumption of fruits and vegetables is $10.8 billion, $23.3 billion, and $3.3 billion per year, respectively (Ekwaru et al., 2016; Krueger, Krueger, & Koot, 2015). Revels, Kumar, and Ben-Assuli (2017) conducted a time series analysis to forecast future incidence of obesity, and costs associated with obesity-related healthcare in the United States. They predicted that the proportion of people with overweight will decline slowly over the next two decades, while people with obesity will increase and could reach as high as 45% of the population by 2035 (Revels et al., 2017). Moreover, it was projected that the number of people with morbid obesity (BMI of 40 or more)

will also increase substantially in the coming years (Revels et al., 2017). This implies that associated direct and indirect healthcare costs will also rise in the coming years. It can be argued that Canada has a similar food industry and lifestyle as the United States; thus, it could be assumed that overweight/obesity will also increase at a comparable projected rate in Canada. Of greater concern is that overweight/obesity developed at a young age results in complex healthcare resources being accessed at earlier life stages than in the past – meaning that burden of care starts from a young age (Hayes et al., 2016). It has been reported that school-age children with overweight/obesity have higher medication use, hospital costs, and nonhospital costs, and more outpatient and emergency department visits than their counterparts without overweight/obesity (Au, 2012; Clifford et al., 2015; Hayes et al., 2016; Solmi & Morris, 2015; Trasande, Liu, Fryer, & Weitzman, 2009). Diseases that were typically diagnosed in adults are now being reported in children, such that type 2 diabetes is being diagnosed in children as young as six years old (Gungor, 2014; Pinhas-Harniel & Zeitler, 2005). Given the health and financial implications of obesity, it is important to focus public health efforts on prevention, in addition to treatment, once obesity and its comorbidities have already developed. Moreover, prevention efforts should begin as early as possible to intervene before less healthy habits develop.

Obesity and the Family Unit

Researchers have reported that children whose parents have overweight/obesity are more likely to develop overweight/obesity themselves (Golan, Kaufman, & Shahar, 2006; Lioret et al., 2012). Parents' knowledge, attitudes, and behaviours toward PA and nutrition exert an important influence on their children's perspectives, in that children often adopt their parents' behaviours and attitudes (Lioret et al., 2012). A theory published over 30 years ago remains relevant today: that is, according to Family Systems Theory (Bowen, 1978), families live in complex systems in

which multiple interactions occur simultaneously and are reciprocal in nature. Each family member is shaping, and being shaped by, other family members (Minuchin, 1974). As such, these mutually influencing patterns within the family are important to consider when designing obesity prevention initiatives; and, to properly target child health behaviours, parental and family interactions and parental modeling must also be considered (Berge & Everts, 2011). The implementation of health behaviours in families, such as PA and healthy eating, depend on the family system by parents either choosing to support or model these behaviours or not (Berge & Everts, 2011). Interestingly, it has been reported that foods that mothers eat (and therefore model) play an important role in shaping children's food preferences, with young children being more likely to imitate their mother's eating behaviours than those of other caregivers (Scaglioni, Salvoni, & Galimberti, 2008). Scaglioni and colleagues (2008) posited that this is because mothers often spend more time than fathers directly interacting with their children across several familial situations. Given that parents shape the way their children view and implement healthy behaviours, family-based approaches have been deemed as effective for obesity reduction and prevention initiatives (Berge & Everts, 2011).

Parental motivation to engage in healthy behaviours plays an important role in children's health behaviours in that parents are primarily responsible for enacting familial lifestyle changes (Maximova, Ambler, Rudko, Chui, & Ball, 2014). Researchers have recommended assessing motivation in parents prior to program delivery to gauge whether they are ready, willing, or able to make behaviour changes (Gunnarsdottir, Njardvik, Olafsdottir, Craigshead, & Bjarnason, 2011; Maximova et al., 2014). Parents who have high engagement in, and motivation for, behaviour change reported positive dietary (e.g. reduced portion sizes) and PA habits (Maximova et al., 2014). Moreover, high parental motivation to engage in a pediatric obesity intervention has

been associated with decreased zBMI[1] scores, and decreased consumption of sugar-sweetened beverages and sweets in children (Jang, Chao, & Whittemore, 2015; Van Allen et al., 2014). This indicates that changes in parental motivation are related to children's weight-related outcomes (Van Allen et al., 2014). Thus, assessing levels of parental motivation before and during health behaviour programs is imperative to the success of the program, in that motivation to/not to implement behaviours directly impacts their children's engagement in those behaviours.

Family-Based Obesity Prevention/Treatment Interventions

Obesity prevention/treatment interventions involving at least one parent have proven more effective than child-only programs, given that obesity tends to exist in the entire family unit (Epstein, Myers, Raynor, & Saelens, 1998; Golan et al., 2006; Gruber & Haldeman, 2009; Lioret et al., 2012; Moore & Bailey, 2013). Furthermore, direct parental involvement (i.e., parents' presence at education sessions or attendance and participation in behavioural counselling or training sessions) in behaviour change programs has been shown to increase intervention effectiveness compared to indirect parental participation (i.e., provision of information that does not require parental response or involvement in activities; Hingle, O'Connor, Dave, & Barawnowski, 2010; van de Kolk, Verjans-Janssen, Gubbels, Kremers, & Gerards, 2019). Interventions that engage parents directly have a higher likelihood of success in influencing children's health behaviours (e.g. consumption of fruits and vegetables, levels of PA; van de Kolk et al., 2019). In a randomized community trial targeting childhood obesity prevention in families, 30 public recreation centers in California were randomized to intervention (i.e., weekly family workshops for four weeks, one-hour home visits, plus educational materials) or control

[1] BMI standard deviation scores: Measures of relative weight-adjusted for child age and sex. Given a child's age, sex, BMI, and an appropriate reference standard, a BMI z-score (or its equivalent BMI-for-age percentile) can be determined. BMI z-scores correspond to growth chart percentiles.
Must, A. & Anderson, S. E. (2006). Body mass index in children and adolescents: Considerations for population-based applications. *International Journal of Obesity, 30*, 590-594.

conditions (i.e., families received different educational materials – for example, fire safety, dental care, and environmental awareness – and completed measures at the same times as intervention families; Elder et al., 2014). At two-year follow-up, it was found that parents and children in the intervention group seemed to increase their awareness of their habits and reduced their consumption of fats and sugary beverages more so than the control group (Elder et al., 2013). These findings are supported by a recent systematic review exploring the effectiveness of childcare-based interventions with direct parental involvement on the weight status and health behaviours of children (van de Kolk et al., 2019). The researchers concluded that children (ages 2-5 years old) whose parents were actively engaged through participatory intervention design, or activities including both parents and children, demonstrated greater health behaviour change in children than children whose parents were not actively involved (van de Kolk et al., 2019). The researchers reported that obesity prevention interventions are more effective when they comprehensively target health behaviours, as opposed to weight status or a single behaviour in isolation (van de Kolk et al., 2019).

While family-based interventions in community-based settings have been successful, focusing on the home environment to enact behaviour changes are likely to have a greater influence on parents and children (Epstein et al., 2007). The home environment is where behaviours are learned and developed, thus targeting nutrition and PA in children and parents could initiate family resources to improve the efficacy of childhood obesity treatments. Simultaneously engaging both parent and child benefits both, teaches parents skills to facilitate behaviour change, and creates positive relationships between parents and their children with regard to engaging in healthy behaviours together (Epstein et al., 2007). In addition, because autonomy in decision-making is developed in adolescence, it is important to establish healthy

habits in children prior to this stage, so that healthy habits are carried through to future life stages (Dickey & Deatrick, 2000). Parents are key role models for these health behaviours, and thus, should be engaged to make changes in their own habits and within their home environments (Faith et al., 2012).

In a review conducted by Jang and colleagues (2015), the researchers reported that targeting parents in the management of childhood overweight and obesity resulted in positive outcomes for children. Children improved their health behaviours (including healthy eating and PA), eating psychopathology and negative thought patterns, and self-efficacy (Jang et al., 2015). These findings are in line with those of Sheldon and colleagues (2007), in which parents in the intervention group (who received group education sessions) significantly improved their parenting skills and health behaviours over those in the control group. Other researchers have corroborated these findings, reporting that parental involvement in health behaviour interventions result in positive behaviour changes in their children (Niemeier, Hektner, & Enger, 2012).

Targeting Obesity via CALC

One approach that has been deemed an effective for short- and long-term behaviour change in adult populations is CALC. Grounded in well-established behavior change theory (e.g. Social Cognitive Theory [Bandura, 1986] and Self-Determination Theory [Deci & Ryan, 1985]), CALC's utilization has resulted in reductions in BMI, smoking cessation, and improvements in motivation and relevant psychosocial variables such as self-esteem and functional health status (e.g. Mantler, Irwin, & Morrow, 2014; Newnham-Kanas, Irwin, & Morrow, 2008; Pearson, Irwin, Morrow, & Hall, 2012). In terms of obesity-related interventions specifically, CALC has been consistently correlated with improvements in self-esteem, health status, and reductions in

waist circumference, body weight, and BMI (Newnham-Kanas et al., Pearson et al., 2012; van Zandvoort, Irwin, & Morrow, 2008; 2009). Individuals who previously participated in CALC for obesity-related behaviour change have attributed increased self-confidence, developing coping mechanisms, and the ability to prioritize themselves to their coaching experiences (Newnham-Kanas et al., 2012).

The tenets of CALC state that clients are the experts in their own lives, and therefore have the answers to resolve their difficulties (Kimsey-House, Kimsey-House, Sandahl, & Whitworth, 2018). In recognition of the client's autonomy, coaching sessions focus on the agenda of the client's choosing and the role of the coach is not to provide advice, but rather to help guide the client to uncover barriers and facilitators to their own behaviour change (Kimsey-House et al., 2018).

To the researchers' knowledge, the utility of CALC within a parent- or family-focused obesity reduction/healthy bodyweight promotion intervention aiming to impact the family unit has yet to be explored. From the above, it is clear that researchers have identified the value of CALC as an obesity reduction intervention, as well as the necessity of incorporating parents in children's health interventions; and supporting parent-child dyads is vital for sustained behavior change (Mikhailovich & Morrison, 2007; Peters, Parletta, Lynch, & Campbell, 2014; Skouteris et al., 2012; Teder et al., 2013).

Importance of Assessing Participant and Interventionist Perspectives

The effectiveness and impact of health programs can be ascertained, in part, by understanding participants' and interventionists' experiences in these programs (Schalkwijk et al., 2015). Collecting this information allows researchers to design health promotion programs with participants' expectations and experiences in mind, with the hopes of improving the

adoption and implementation of these programs (Schalkwijk et al., 2015). Qualitative data provides information on facilitators and barriers to program participation and behaviour change, as well as provides context to participants' experiences within the program (Schalkwijk et al., 2015). Collecting providers' perspectives informs researchers and program planners about best practices and can help them understand what constitutes 'good' quality care (Pope, van Royen, & Baker, 2002). Participant and provider perspectives can be vital to future programs in this field. This collective appreciation lends itself to understanding what works best for parents and their families with regard to behaviour change, along with providers' experiences with program delivery and the changes they recommend (Pope et al., 2002).

Purpose of Dissertation

The brief overview of background information presented above was intended to contextualize some of the content that informed this dissertation's focus. As a health promotion project, the ultimate objective of this doctoral research program was to provide parents and their children with the opportunity to promote healthy behaviours and reduce obesogenic ones. To that end, the researcher (and her colleagues) designed a comprehensive intervention and utilized a mix of qualitative and quantitative data to understand its impact on participants as well as their, and participating coaches', experiences partaking in this program.

Following the content presented above, the purpose of this dissertation is to provide a detailed overview of, findings from, and experiences participating in a 3-month randomized controlled trial (including a descriptive qualitative component) targeting obesity-related behaviours in parents with overweight/obesity (BMI $\geq$ 25 kg/m^2) and their children (ages 2.5-10 years old, of any weight; N = 50 dyads). In this trial, the parent-child dyads were randomized to receive either Co-Active Life Coaching (CALC) and/or webinar-based health education, which

were administered to the parent of the dyad. To address the dissertation's purpose **Chapter II** provides a detailed methodological account of the parent-child intervention conditions, including the rationale for their development and an in-depth description of methods and measures used. Then, **Chapter III** focuses on exploring the impact of the intervention on the primary outcomes of physical activity (PA) and dietary intake of parents and children, and parental motivation to engage in healthy behaviours. To determine anthropometric impacts, parental BMI and waist circumference were also included. Parental perceptions of program improvements were also collected to better understand how to make this method of behaviour change more effective. Finally, because understanding both participant *and* coach perspectives is important to appreciate what the experience was like for each and, thus, what might be needed to maximize this behaviour change approach moving forward, **Chapter IV** presents a qualitative exploration of the experiences of parents and coaches who participated in the intervention group.

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Chapter II: Coaching and/or education intervention for parents with overweight/obesity and their children: Study protocol of a single-centre randomized controlled trial[2]

Currently, fewer than 10% of Canadian children meet the guideline of 60 minutes of moderate-to-vigorous physical activity (MVPA) per day, while only 15% of Canadian adults meet the guideline of 150 minutes of MVPA per week (Garriguet, Colley, & Bushnik, 2017). In addition, it has been reported that Canadian adults with children are less active than those without children (Garriguet et al., 2017). Long-term persistence of these behaviours can result in the development of overweight/obesity in both adults and children, in turn causing the development of adverse health conditions, which are generally preventable (Caballero, 2007; Lifshitz, 2008). Overweight/obesity in early life stages continues into adolescence and adulthood, and can result in lifelong struggles with physical, mental, and social health (e.g., asthma, blood pressure, weight-based stigmatization, behavioural problems, and low self-esteem; Lifshitz, 2008; Litwin, 2014; Lobstein, Baur, & Uauy, 2004).

Family and home environments shape early health habits, and parents play a crucial role in developing their children's nutrition and physical activity (PA) behaviours, in that parents determine the types of foods available in their homes and provide opportunities to be active (or inactive; Ventura & Birch, 2008). Therefore, it is important to encourage and support the development of healthy behaviours within the family unit, and to provide parents with resources and knowledge to promote these healthy habits.

Interventions designed to prevent and/or reduce obesity in adults and children, should engage both parent and child in order to develop healthy behaviours within the family unit

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overall. Thus, the researchers of this project sought to determine the impact of coaching and/or education on parents with overweight/obesity and the consequent impact on their children (aged 2.5-10, of any weight).

Pediatric and Adult Overweight/Obesity and Associated Adverse Effects

Pediatric overweight/obesity. American data reveals that one quarter of preschool-aged children have overweight or obesity; in Canada, 8.5% of children aged 5-9 years and 12.9% of 10-14 year-olds experience obesity (Davison, Jurkowski, Li, S, & Lawson, 2013; Rao, Kropac, Do, Roberts, & Jayaraman, 2016). In the same age groups, the rates of overweight are 15.4% (5-9 year-olds), and 23.0% (10-14 year-olds; Rao et al., 2016). Males aged 5-11 were reported as significantly more likely to have obesity than females in the same age group (Public Health Ontario, 2013; Statistics Canada, 2015). These are alarming statistics for a problem that is preventable if supportive and sustainable lifestyle tools are in place.

The increase in obesity rates also has caused a drastic increase in the incidence of adult obesity-related diseases, such as Type 2 diabetes, cardiovascular disease (CVD), obstructive sleep apnea, and mental disorders in children (Kuhle et al., 2011). Children with overweight/obesity are more likely to develop CVD compared to adults, and subsequent weight loss may not eliminate that excess risk (Litwin, 2014). Conditions such as elevated blood pressure, insulin resistance, and dyslipidemia (i.e., an abnormal amount of lipids in the blood) are being diagnosed in children, prompting the growth of new specialties and clinics targeted toward treating hypertension, Type 2 diabetes, and fatty liver in pediatric populations (Litwin, 2014). Children with obesity are 3 times more likely to develop hypertension than their normal-weight counterparts, and 40% of children with overweight will continue to have

increased weight during adolescence (Lifshitz, 2008). In fact, up to 80% of adolescents with obesity will maintain this weight status into adulthood (Lifshitz, 2008).

Obesity is related significantly to feelings of shame in children, which may affect the development of the child's personality, identity, and socialization, and can result in decreased pursuits of higher education (Hohwü, 2015). A review conducted by Hamilton and colleagues (2018) outlined that, in the United States, 25 to 31-year-old adults who experienced obesity as adolescents earned 7.5% less than their counterparts who did not have obesity as adolescents. Lifetime healthcare costs and income penalties were greater in females who experienced obesity as adolescents, while costs due to workdays lost were greater in males who experienced obesity as adolescents (Hamilton, Dee, & Perry, 2018). In addition, there seemed to be proportionality between BMI and costs, in that lifetime costs (i.e. healthcare costs and productivity loss costs) increased in proportion with excess weight in childhood or adolescence (Hamilton et al., 2018).

The above overview underscores the intensity of overweight/obesity-related issues for children, and the importance of encouraging and developing early healthy bodyweight behaviours among children of any weight (Bridger, 2009; Franks et al., 2010). As outlined below, parents' own obesity status and behavioural prompts are key influencers in the development of their children's healthy behaviours.

Adult overweight/obesity. In 2014, 20.2% of Canadians 18 and older (roughly 5.3 million adults) reported height and weight that classified them as obese, and 40.0% of men and 27.5% of women were classified as overweight (Statistics Canada, 2015). Similar to childhood overweight/obesity, the condition in adulthood is a risk factor for developing poorer health outcomes such as diabetes, heart disease, stroke, and some types of cancer (Centers for Disease Control and Prevention [CDC], 2018). The psychological effects of obesity are among the most

underestimated consequences of this disease; these include reduced quality of life, bullying, negative self-esteem, increased anxiety, risk of isolation, and worsening depression (Hohwü, 2015).

The causes of obesity are complex, and include an interaction of biology/genetics, behavioural, social, and environmental factors that result in excess weight (Brauer et al., 2015). In order to encourage sustainable healthy behaviour changes, it is important to implement lifestyle interventions that address a variety of risk factors (Brauer et al., 2015).

Importance of Involving Parents in Childhood Obesity Prevention/Interventions

Dietary and PA habits established during the early years determine the progression of obesity later in life (Skouteris et al., 2012), Given children's parents, home, and family environments are among the strongest influences on their health behaviours, an optimal method for promoting and encouraging positive behaviour change is targeting, as a dyad, parents *and* their children during their formative younger years (Faith et al., 2012; Peters, Parletta, Lynch, & Campbell, 2014; Skouteris et al., 2012; Wolfenden et al., 2012).

The odds of becoming obese as an adult are doubled for children under age 10 who have at least one obese parent, and the probability of childhood obesity persisting into adulthood is estimated to increase from approximately 20% at age 4 years to approximately 80% by adolescence (Tucker, 2009). Therefore, interventions that require only the adult dyad member to be overweight or obese provide a suitable approach.

Children's obesity-related behaviours are influenced by parental knowledge (how to cook healthy meals), attitudes (valuing PA), modeling (being active themselves), support (financial, logistical, participating with their child), and encouragement (Garriguet et al., 2017; Lioret et al., 2012; Summerbell et al., 2012; Whitaker, Jarvis, Beeken, Boniface, & Wardle, 2010; World

Health Organization, 2017). In fact, parental role modeling and support for PA are independently associated with their children's PA levels (Garriguet et al., 2017). Furthermore, when compared to interventions targeting children only, programs that also engage parents are associated with higher self-esteem among the children participants (Walker & Hill, 2009).

Previous research examining the influence of family on childhood overweight/ obesity has focused predominantly on parent-centered, unidirectional aspects of parenting (i.e., what the parent does or believes), including maternal feeding practices, and parental PA and nutrition knowledge (Ventura & Birch, 2008). Specifically, childhood obesity researchers have measured primarily characteristics and/or behaviours of the parent and child individually (Skouteris et al., 2012). More recently, researchers have examined parents' actions as well as how they complete these actions, by investigating relationships between parenting styles and young children's weight status (Skouteris et al., 2012). The direction of developmental research has also shifted to viewing the parent and child as a unit or dyad as opposed to as individuals, thereby examining and encouraging an interactive perspective on the parent-child relationship (Skouteris et al., 2012; Teder et al., 2013). This interactive standpoint reflects the relations between parents and their children and demonstrates that children's development is shaped by the reciprocal nature of both parent- and child-level factors (Skouteris et al., 2012; Teder et al., 2013).

A further reason to communicate with parents about their children's health behaviours is to increase parental awareness regarding the risks associated with children developing overweight/obesity and its adverse conditions, and to encourage parents to take action toward promoting healthy behaviours (Mikhailovich & Morrison, 2007). Parents who recognize excess weight in their children as a health risk may be more motivated to encourage healthy behaviour change than parents who do not (Etelson, Brand, Patrick, & Shirali, 2003; Wu, Yu, Wei, & Yin,

2003). Thus, education and support for parents is a fundamental step to promoting healthy behaviours in children and their families (Wolfenden et al., 2012).

Although child involvement is important in family-based initiatives, the parent controls implementation of the treatment/intervention (Gunnarsdottir, Njardvik, Olafsdottir, Craighead, & Bjarnason, 2011). Thus, successful completion of program tasks is mostly determined by the parents' motivation for participation (Gunnarsdottir et al., 2011). Obesity prevention researchers have shown that parental motivation is significantly associated with encouragement of healthy behaviours (i.e. dietary and PA changes) in their children (Gunnarsdottir et al., 2011; O'Neil et al., 2010; Van Allen et al., 2014). Therefore, it can be hypothesized that parental characteristics, particularly motivation to participate in and complete a behaviour change program with their child, are important in the development of obesity prevention initiatives for the family unit (Gunnarsdottir et al., 2011). Thus, the researchers of the current paper have included measures to assess parental motivation to engage in healthy behaviours.

With regard to the most effective methods of targeting parents, Wolfenden and colleagues (2012) reported that a random sample of parents of children between the ages of 2-15 expressed a preference for, and increased use of, low-intensity interventions, such as the delivery of information through mail or email. In addition, telephone and internet-based services were viewed as intensive and interactive support that parents would be most likely to use (Wolfenden et al., 2012).

The research summarized above identifies a need for behaviour-based strategies to focus on modifying family lifestyle patterns to prevent and reduce the prevalence and impact of obesity and its associated health consequences on parents and their children. In order to promote behaviour change within the family unit, the method of education and/or Co-Active coaching

was selected because of their success in developing sustainable behaviour change within individuals. The importance of considering empowerment when using parent-child dyads as a strategy to facilitate and sustain behaviour change has yet to be fully explored, and Co-Active coaching may prove to be an effective approach.

Co-Active Coaching

Some coaching definitions and training programs posit that the primary purpose of coaching is to advise clients and is based on a relationship where the coach is viewed as the 'expert' (Irwin & Morrow, 2005). In terms of health-related behaviour change, some studies consider a coach to be any support person who coaches an individual who is living with an illness of health issue (Irwin & Morrow, 2005). However, coaching does not represent a specific phenomenon, but instead connotes a behavioural intervention with many dimensions and styles (Irwin & Morrow, 2005). As such, it is important to clearly identify the method of coaching employed when attributing behaviour change to coaching (Irwin & Morrow, 2005).

Co-Active coaching (Kimsey-House, Kimsey-House, Sandahl, & Whitworth, 2018) involves an alliance between coach and client, using key behavioural elements including self-efficacy, acknowledgement, goal-setting, personal values, and empowerment (Kimsey-House et al., 2018; Liu, Irwin, & Morrow, 2015). The premise of Co-Active coaching does not center on solving problems, though problems may be solved through the process, but is a way of effectively empowering people to find their own answers (Kimsey-House et al., 2018). The client is viewed as the expert on his/her own life and has the answers – albeit, often not concretized prior to coaching – to their own life questions, thus empowering the client to create their own solutions to their identified problems (Kimsey-House et al., 2018). The term 'Co-Active' refers to the fundamental nature of a coaching relationship, in which the coach and client are active

collaborators, and create an alliance in order to meet the client's needs (Coaches Training Institute [CTI], 2016). This partnership between coach and client seeks to meet the needs and learning style of the client, which, in turn, strengthens the client's ability to self-manage his/her behaviours and attitudes based on his/her own values (Kimsey-House et al., 2018).

Co-Active coaching is an accredited coach-training method recognized by the International Coaching Federation (CTI, 2016). The Co-Active coaching accreditation program spans approximately 12 months and is comprised of 5 in-person experiential workshops, followed by a six-month certification program (CTI, 2016). The CTI (2016) and Kimsey-House and colleagues (2018) outline the three foundational principles of Co-Active coaching, which are: fulfillment (indicating life satisfaction); balance (based on using different perspectives to view situations and make meaningful choices); and process (fully experiencing any given moment). This Co-Active model is based on the client's agenda, and the relationship between coach and client is tailored to the communication approach that works best for them (Coaches Training Institute, 2016; Liu et al., 2015; Pearson, 2011).

Co-Active Coaching and Adult Obesity

Researchers have established that interventions targeting health behaviour change should be based upon tested theories, and that these theories encompass the psychological and structural processes that are assumed to guide and regulate behaviour (Brug, Oenema, & Ferreira, 2005; Fishbein & Ajzen, 1975; Rothman, 2004). The Co-Active coaching approach has been grounded in several well-established behavioural theory frameworks (Irwin & Morrow, 2005; Pearson, 2011), such as Social Cognitive Theory (Bandura, 1986), the Theory of Reasoned Action (Fishbein & Ajzen, 1975), and the Theory of Planned Behaviour (Ajzen, 1991). Co-Active coaching researchers have demonstrated this approach's effectiveness in producing positive

behaviour change in a variety of health-related areas, such as PA, nutrition, and smoking cessation, and more germane to this study, overweight/obesity (Mantler, Irwin, Morrow, Hall, & Mandich, 2015; Newnham-Kanas, Morrow, & Irwin, 2011; van Zandvoort, Irwin, & Morrow, 2008).

Co-Active coaching has been evaluated as an effective short- and long-term obesity reduction approach in adult populations, and shown positive results, including reductions in BMI and improvements in relevant psychosocial variables such as self-esteem and functional health status (Newnham-Kanas et al., 2011; Pearson, Irwin, Morrow, & Hall, 2012; van Zandvoort et al., 2008). While an increasing number of studies have underscored the need to explore parent-focused or family-based childhood obesity prevention interventions (Bean, Wilson, Thornton, Kelly, & Mazzeo, 2012; Haire-Joshu et al., 2008; Lioret et al., 2012; Paineau et al., 2008; Teder et al., 2013), no studies have explored the utility of a coaching approach, such as Co-Active coaching, within a parent- or family-focused obesity reduction/healthy bodyweight promotion intervention aiming to impact both a parent and child concurrently. The value of coaching as a healthy weight intervention for adults, the necessity of incorporating parents in children's health interventions (e.g., Janssen, Lam, & Katzmarzyk, 2009; Pearson, Irwin, Burke, & Shapiro, 2013; Reilly et al., 2018; West, Sanders, Cleghorn, & Davies, 2010), and supporting parent-child dyads is vital for sustained health behaviour change has been clearly outlined in previous research (Peters et al., 2014; Skouteris et al., 2012; Tucker, 2009).

Study Purpose

This study will explore the impact of a parent coaching intervention, with parent and child outcomes, on promoting healthy behaviours among the dyad. Specifically, this research aims to identify the impact of a coaching plus health education intervention compared to health

education only on: (a) the PA levels of children (ages 2.5-10) and their parents with overweight/obesity; (b) the dietary intake of children and their parents with overweight/obesity; (c) parental motivation to engage in healthy behaviours; and (d) parental perspectives on how the program has impact on their and their child's nutrition and PA behaviours. These primary outcomes will be measured via in-person parent interviews, parent and child 7-day step count and 24 hour dietary intake, and standardized and validated questionnaires. Due to children's active growth periods, PA and nutrition behaviours can be better predictors of health than anthropometric indicators (Janssen et al., 2009). Secondary outcomes will be measured by assessing: (a) parental BMI (calculated by measuring weight in kg, over height in m^2); (b) parents' overall perception of health; and (c) parents' psychosocial variables (i.e., social support, self-esteem, and self-efficacy).

The research team hypothesizes that immediately following and at 6 months post-intervention, the coaching plus education group will report higher levels of parent-child PA, greater improvements in parent-child dietary intake choices, greater parental psychosocial benefits, and greater improvements in parents' BMI values, compared to those who receive education only. The research team predicts that parents from higher socioeconomic status (SES) backgrounds will be impacted more favorably than those from lower SES backgrounds, as researchers have found greater difficulties associated with affecting behaviour change within lower SES environments (Peters et al., 2014). It is also hypothesized that male parents and children will have higher PA levels, while female parents and children will have greater dietary intake improvements, and female parents' psychosocial health will be impacted most positively, given that previous research has found young males tend to be more active than their female

counterparts, and obesity affects psychosocial health of women more negatively than men (Walker & Hill, 2009).

The purpose of the current protocol paper is to provide a detailed methodological account of this parent-child study with a view toward informing future coaching and obesity prevention/treatment programs designed to impact health behaviours positively within the family unit.

Methods/Design

Study Design

This 3-month, single centre, randomized controlled trial (in accordance with SPIRIT guidelines; SPIRIT, 2010) is currently underway and aims to improve PA and nutrition behaviours within the family unit. Using a single blind, block randomized design via computer randomization (using an online random sequence generator), parent-child dyads are assigned to either: coaching plus health education (intervention) or health education alone (control). The blocked randomization design ensures an equal proportion of dyads are assigned to each group. Only the lead researcher is aware of allocation assignment; parent participants are made aware of their group assignments at their baseline appointments.

Sample size and eligibility criteria. A sample size calculation was conducted using the Horatio Computer Software program (Lee, 2004). The inclusion of 50 parent-child dyads was deemed sufficient to detect a large effect size (d = 0.8) of a two-level, between groups independent variable, 79% of the time, using a 0.05 alpha level.

To be eligible for this study, parents/guardians must have a BMI of $\geq$ 25 kg/m^2, live with their child (aged 2.5-10) for at least 5 days of the week, speak English, and are comfortable using a computer for data collection purposes. Because adolescence spans 10-19 years (Canadian

Paediatric Society, 2003), the research team decided targeting children aged 10 and under for the study described in this paper would be the most impactful. If there are two parents and two children in a family who meet the inclusion criteria, they are permitted to participate as two separate dyads. In the case where two parent-child pairs within the same household are both randomized to receive the intervention, the parents will work with two different coaches.

Certified Professional Co-Active Coaches (CPCCs). A total of 16 certified CPCCs have been recruited through the research team's network to deliver the intervention (three coaching sessions per month, for three months) to parents assigned to the intervention group. The lead researcher informs interested coaches about the study design and outcomes being measured and answers any questions or concerns coaches may have. Coaches involved in the study are assigned between 1-3 participants based on how many they feel they can work with over the duration of the study. Upon completion of the intervention, coaches receive an honorarium for each participant with whom they have worked.

It is important that all coaches are certified in Co-Active coaching because: (a) it is an accredited method of coaching, (b) it is consistent with respect to training, in that all coaches are taught the same way and use consistent tools; and (c) this particular coaching method has been shown to be effective in changing health behaviours (Irwin & Morrow, 2005).

Participants and Recruitment

Ethical approval has been obtained from the Office of Research Ethics at the host institution. Participants are being recruited via poster advertisements at various locations including: clinics and medical offices, childcare centers, pharmacies, the local health unit, Young Men's Christian Association (YMCA) sites, libraries, recreation centers, Ontario Early Years Centers, and community organizations (including local businesses). In addition, a radio

advertisement is airing, and recruitment posters are advertised on Facebook groups/pages, Twitter, Kijiji, and in a local parenting magazine. Once participants contact the researcher, the study is explained in more detail, and the researcher asks several questions to determine eligibility. When a parent-child dyad is determined as eligible to participate, a baseline appointment is made in order to conduct the parent's measurements (height, weight, and waist circumference), inform the parent of group assignment, sign consent forms, provide the dyad with pedometers, and further explain how the study will unfold.

Data collection. Rolling enrollment has been adopted, making the data collection periods tailored to each individual in the study. Data are being collected at baseline (i.e., one week prior to the start of the intervention); six weeks into the intervention; immediately post-intervention (i.e., three months); and six months post-intervention. All data is being entered electronically at the host university, on a secure server. Consent and other written forms are stored and locked in a secure drawer, in a locked office, at the host university. In order to maintain confidentiality and anonymity, participants are assigned a unique identification code upon registering in the study. Participant files will be kept in storage for up to 5 years after completion of the study. Baseline and follow-up assessments are conducted at the host university or at the participant's home by the lead researcher and a research assistant. An email link is sent to parent participants asking them to complete the questionnaires, and email and telephone reminders are conducted one and two weeks later if no response is received. If there is no response, it is assumed that the participant has missed the data collection time and contact re-commences at the next follow-up time. If a participant cannot be contacted after three consecutive communication attempts, it is assumed that they are lost-to-follow-up. A grocery store gift card is provided to participants who

complete the study. An overview of study measurements and time points can be found in Table 1.

Table 1. Study schedule of enrolment, interventions, and assessments

	Study Duration				
TIMEPOINT	**Screening**	**T1 (Baseline)**	**T2 (6-Week)**	**T3 (Post-Intervention)**	**T4 (6 months post intervention)**
Eligibility Assessment	X				
Informed Consent		X			
Demographic Form		X			
Allocation	X				
INTERVENTIONS					
Intervention Group: Coaching + Education		←	—	→	
Control Group: Education Only		←	—	→	
ASSESSMENTS					
Parental BMI + waist circumference		X	X	X	X
Parent in-person interview		X	X	X	X
Parent questionnaires		X	X	X	X
Parent & Child 24 Hour Dietary Recall and 7-Day Step Count		X	X	X	X

Health Education Sessions for Parents

Participants in the control group receive 6 online health education sessions, with three sessions focused on PA (i.e., benefits of PA; guidelines; sedentary behaviour; sleep; physical literacy; ideas for increasing PA in daily lives of parent and child; and local resources to help increase PA), and three sessions focused on nutrition (i.e., understanding nutrients and nutrition labels; eating with children; positive food environments; challenges to healthy eating; and healthy eating on a budget). The research team, who has collective expertise in each area, created and reviewed these sessions.

The online health education sessions are open to participants upon entry to the study, and parents are asked to engage in their next lesson approximately 7-10 days after their previous one. As this is intended to be a person-focused study, online lessons are being used to best accommodate the realities of each participant's schedule. The completion of each lesson is being tracked by participant login and duration, and by a 'What is the most important lesson I took from this session?' question that they are asked to complete and submit at the end of each module.

Co-Active Coaching plus Health Education Intervention

Participants in the intervention group receive the same six health education sessions described above, plus Co-Active coaching. Parent participants create a schedule with their coach to receive nine, 20-minute, one-on-one, telephone-based coaching sessions (3/month for 3 months) focusing on the agenda of the parent's choosing. Parent participants are matched with a CPCC and together, they create a schedule to engage in nine, 20-minute, one-on-one telephone-based coaching sessions (3/month for 3 months). Thereafter, the participant calls the CPCC at the pre-arranged time and at the start of the conversation the client is responsible for identifying the

agenda on which they want to focus during that session. The coach has been asked to use only their CPCC skills, which include but are not limited to asking genuinely curious open-ended questions, reflecting back what the participant says, acknowledging the experience that the participant shares, and championing their progress. For a full review of the Co-active coaching approach, see Co-Active Coaching: Changing Business, Transforming Lives (Kimsey-House et al., 2011).

Measures

At baseline, the parent participant is asked to complete demographic information forms on behalf of themselves and their child. Both groups complete the same assessments at each follow-up period and these consist of BMI (height and weight), waist circumference, step count, dietary intake, standardized and previously validated measures (a detailed list is included below), and open-ended questions to glean parents' perceptions of how the intervention is impacting them and their child (any domain the parent chooses to discuss).

Primary Outcome Measures

7-day step count. Yamax Digi-Walker SW-650 pedometers are provided to participants (for both parent and child), as this model is used frequently in research (Foley et al., 2016; Spence, Burgess, Rodgers, & Murray, 2009). The Digi-Walker SW-650 records steps, calculates distance travelled based on individual stride length, and has a stopwatch. For the purpose of this study, only step-count data are recorded. Participants are asked to wear the pedometer for all waking hours except when swimming or bathing, and to reset it to zero each morning, over the course of one week (7 days; Foley et al., 2016) at all measurement time points.

24-Multi-Pass Recall. This tool is typically conducted via in-person or telephone interview; however, for the purposes of this study, dietary intake data is being conducted online.

Arab and colleagues (2011) tested the validity of web-based, 24-hour recall within two ethnicities. When testing attenuation factors (λ; the degree to which correlations between dietary intake and true intake were underestimated or overestimated because of random error in reporting), the researchers found that the entire cohort reported high (λ=0.28) attenuation factors with web-based recall. Additionally, the rate of underreporting of more than 30% of calories was low – 25% and 34%, for African Americans and Caucasians, respectively; (Arab et al., 2011).

International Physical Activity Questionnaire (IPAQ). The IPAQ is a self-reported measure of PA that has been validated, and deemed acceptable for monitoring levels of physical activity, among 18-65 year olds in diverse settings (Craig et al., 2003). Participants are asked how many days per week, and how many minutes per day they walked and engaged in moderate-intensity and vigorous-intensity activities during the past week (Craig et al., 2003). Sedentary behaviours are assessed by asking about sedentary time accumulated from traveling, at work, watching television, and using a computer at home and at leisure; (Craig et al., 2003). Test-retest reliability data for the long IPAQ questionnaire show Spearman correlation coefficients around 0.80, indicating very good repeatability, and criterion validity correlations ranged from 0.14 to 0.53, with a median of 0.30 (Craig et al., 2003).

Treatment Self-Regulation Questionnaire (TSRQ). The TSRQ (Ryan & Connell, 1989) is used to determine why participants engage or would engage in healthy behaviour (i.e., their motivations). Responses are ranked on a 7-point Likert scale ranging from not at all true (1) to very true (7). Levesque and colleagues (Levesque et al., 2006) used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to test the validity of the 15-item TSRQ factorial structure. The researchers hypothesized that a 4-factor structure would emerge with: autonomous (i.e., self-determined) motivation, introjection (i.e., behaviours that have been partially taken in

by the person, and are performed to avoid feeling guilty or ego involved), external (i.e., behaviour that is performed in order to obtain a reward or to avoid negative consequences), and amotivation (i.e., absence of motivation) factors (Levesque et al., 2006). The TSRQ has been validated previously with acceptable internal consistency for each subscale ($\alpha > .73$), and established as a useful assessment tool across various settings and for different health behaviours (e.g. tobacco, diet, and exercise; (Levesque et al., 2006).

In-person interviews. In-person, semi-structured interviews, exploring parents' experiences and perceptions of the program, are conducted at each follow-up point. All interviews are voice-recorded and transcribed verbatim.

Secondary Outcome Measures

Body Mass Index (BMI). Parental height and weight is measured at baseline and each follow-up point to track changes in BMI over time.

Multi-dimensional Scale of Perceived Social Support (MSPSS). The MSPSS (Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item scale designed to measure perceived adequacy of support from family, friends, and significant others (Zimet et al., 1988). It uses a 7-point Likert scale, ranging from disagree (1) to very strongly agree (7). When assessing psychometric properties of the scale, Zimet and colleagues (Zimet, Powell, Farley, Werkman, & Berkoff, 1990) found relatively high levels of mean support in the three sample groups they studied (6.01, 5.60, and 5.58), and an internal consistency (Cronbach's alpha) ranging from $\alpha = 0.84$ to 0.92 for the overall scale. The researchers also assessed the validity of the family and significant other subscales using multivariate analysis of variance (MANOVA) and found that both scales were significant (Zimet et al., 1990).

Rosenberg Self-Esteem Scale (RSE). The purpose of the 10-item, uni-dimensional RSE (Rosenberg, 1965) is to measure both positive and negative feelings about self-esteem. The RSE is comprised of a Guttman scale, using 4 response categories (strongly disagree, disagree, agree, strongly agree), and is scored on a metric ranging from 0 (poor) to 30 (excellent; (Sinclair et al., 2010). Item convergent validity is generally considered satisfactory if an item correlates $r \geq .40$ with its hypothesized scale after correction for overlap; the RSE met this criterion for all items overall and across subgroups (Sinclair et al., 2010). Internal consistency of the scale was $\alpha = 0.91$ (Sinclair et al., 2010).

Weight Efficacy Lifestyle (WEL) Questionnaire. The WEL Questionnaire (Clark, Abrams, Niaura, Eaton, & Rossi, 1991) consists of 20-items, which ask participants to rate their confidence about being able to successfully resist the desire to eat, using a 10-point Likert scale ranging from not confident (0) to very confident (9). The internal consistency of the scale ranged from $\alpha = 0.70$ to 0.90.

Self-Efficacy for Overcoming Barriers. These scales assess self-efficacy for performing PA and nutrition behaviours (McAuley & Mihalko, 1998). Self-efficacy for PA is a 12-item measure assessing how confident individuals feel (on a scale of 0-100) when overcoming barriers to being physically active. Participants also completed an 11-item measure to assess how confident individuals feel, on a scale of 0 (not confident at all) to 100 (very confident) when facing barriers to eating a well-balanced diet. Previous research supports the reliability of these scales, with alpha coefficients ranging from 0.73 to 0.95 (McAuley & Mihalko, 1998; Newnham-Kanas et al., 2011; Pearson et al., 2012)

Eating Self-Efficacy scale (ESES). To further assess self-efficacy and eating behaviour, the 25-item ESES (Glynn & Ruderman, 1986) is being utilized. Responses are ranked on a 7-

point Likert scale ranging from no difficulty controlling eating (1) to most difficulty controlling eating (7). The ESES had a high internal consistency ($\alpha = 0.92$), and the test-retest reliability over a 7-week period was also acceptable ($r=0.70$, $p< 0.001$; (Glynn & Ruderman, 1986).

Generalized Self-Efficacy (GSE) Scale. The GSE (Schwarzer & Jerusalem, 1995) is a 10-item scale that assesses participants' coping ability across a wide range of demanding or novel situations (Schwarzer, Mueller, & Greenglass, 1999). It uses a Likert scale ranging from 1 (not at all true) to 4 (very true). The GSE has been used in a variety of research studies, typically yielding internal consistencies between $\alpha = 0.75$ to 0.91, and a test-retest reliability (over a half-year period) of $r=0.67$ (Schwarzer et al., 1999). When tested through an online platform, the GSE had an internal consistency of $\alpha = 0.87$ (based on $n = 1{,}314$ participants with complete data; (Schwarzer et al., 1999).

Short-Form 36 (SF)-36. The self-administered 36-item SF-36 (RAND Corporation, 1992) is used to measure health on eight multi-item dimensions, covering functional status, well-being, and overall evaluation of health (Brazier et al., 1992). The SF-36 had an internal consistency of $\alpha > 0.85$, and test-retest reliability was conducted over a two week interval and, for all dimensions, 91-98% of cases lay within the 95% confidence interval constructed for a normal distribution (Brazier et al., 1992).

Data Analysis

SPSS (version 24) will be used to conduct a repeated measures MANCOVA to assess differences within groups, and a two-way ANCOVA to assess differences between groups, where baseline data will be the covariate, with differences analyzed using the post-hoc Least Square Differences method. As socioeconomic status (SES) has an impact on nearly all health issues, including obesity, and understanding its impact in the proposed project is necessary, a

general linear model utilizing SES as covariate will be completed. Classification for SES will be based on education and low income cut off scores (LICO) utilizing Statistics Canada's definition. The semi-structured interview responses from parents, to determine changes in family health behaviours and overall program experiences, will be analyzed in NVivo by two independent researchers. Inductive content analysis (a method in which patterns, themes, and categories emerge from the data, without an existing framework; Patton, 2002) will be employed to identify feedback themes. This process involves open coding, in which data is read through several times, and as many headings as necessary are written down to describe all aspects of the content (Elo & Kyngäs, 2008). The headings are then collected on a coding sheet, and categories are grouped and sorted into higher order headings (Burnard, 1991; Cole, 1988). Data are classified into groups in order to help describe a phenomenon, increase understanding, and generate knowledge (Cavanagh, 1997). Once categories are decided upon, the two researchers compare headings and come to consensus on final themes, with the support of NVivo software.

Discussion

This protocol paper has detailed a methodological account of a comprehensive study, aimed at exploring the impact of a parent education compared to education plus coaching intervention, with parent and child outcomes, on promoting healthy behaviours among the parent-child dyad.

The increasing rate of overweight/obesity, and the associated adverse health conditions, in increasingly younger populations creates the need for the research outlined in this paper. Given that parents are a primary influence for their children's PA and nutrition behaviours (Garriguet et al., 2017), interventions that support parents in making healthy choices should be explored and promoted further.

Strengths and Limitations

In contrast with previous parent-child interventions, to the best of the researchers' knowledge, this is the first study that will evaluate the impact of Co-Active coaching and/or education on the family unit, via parent and child outcome measures. The use of mixed methods (i.e. using both qualitative and quantitative measures) ensures that the researchers will gain an in-depth understanding of participants' experiences with both the program and process of developing healthy behaviours. In addition, the randomized controlled trial design, use of a comparison group, and incorporation of several previously validated tools also serve as strengths in this study. Interventions that are based on the foundation of health promotion (i.e. enabling individuals to improve and increase control over their own—and in this case, their family's—health; World Health Organization, 1986) have been shown to result in successful behaviour change (Irwin & Morrow, 2005). This program employs education and coaching, both of which encourage participants to develop skills that will allow them to increase control over their health decisions and environments (Pearson, 2012). Another strength of the study is the selected coaching method in that all CPCCs involved are trained in the same manner; meaning participants in the coaching group are receiving similar strategies to help target their areas of concern (Pearson, 2012).

A limitation of this study may be the number of participants who do not complete the program; researchers have reported participants in control conditions of lifestyle interventions are more likely to drop out (Mantler, Irwin, & Morrow, 2010; Pearson, 2012). To counteract this, and encourage full participation, the researchers remain in contact with participants throughout the study (via email reminders to complete assessments, and in-person follow-ups). A further limitation of this study may be low participation of fathers; a review examining the involvement

of fathers in pediatric obesity treatment and prevention programs with parental involvement outlined that, out of 213 included RCTs, only 6% of participants were fathers (Morgan et al., 2017). The researchers are recruiting parents using many different methods, in hopes of reaching both mothers and fathers.

Conclusion

All of the pertinent information necessary to develop and implement a parent-child intervention has been addressed including study design, population rationale, recruitment methods, outcome measure descriptions, intervention procedures, and data collection and analysis. The expected findings from this research will provide important insights into the impact of coaching on parents with overweight/obesity, and its applications to the family unit. From conducting this study, the researchers aspire to learn effective methods to support parents and children in developing and maintaining positive nutrition and PA habits. If effective, this intervention approach can be applied more broadly through public health interventionists to parent and child populations in hopes of reducing obesity-promoting behaviours within both individuals and their families. This program is currently on going; the researchers' intention and goal is to make the results available, via peer-reviewed publications, in 2019.

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Chapter III: Perspectives and impact of a parent-child intervention on dietary intake and physical activity behaviours, parental motivation, and parental body composition: A randomized controlled trial

Background

If developed during childhood, obesity is likely to persist into adolescence and adulthood (World Health Organization, 2017). Moreover, children who have parents with overweight/obesity are at a high risk of developing the disease themselves, in that the family environment exerts an important influence on the development of children's habits (Golan & Crow, 2004; Lioret et al., 2012; Wolfenden et al., 2012). Given that it is more difficult to change health behaviours later in life, it is crucial to establish healthy habits from a young age (Ash, Agaronov, Young, Aftosmes-Tobio, & Davison, 2017).

Currently in Canada, 38% of 3-to 4- year-olds and 61% of 5- to 17-year-olds are not meeting recommended Canadian 24-Hour Movement Guidelines for their age groups (> 60-minutes of moderate-to-vigorous intensity physical activity [MVPA] per day; Canadian Society of Exercise Physiology [CSEP], 2019a, 2019b; ParticipACTION, 2018). In addition, sedentary behaviour in these age groups is on the rise, with 76% of 3- to 4-year-olds and 51% of 5- to 17-year-olds engaging in more screen-viewing time than is recommended by the Canadian 24-Hour Movement Guidelines for recreational screen-based sedentary behaviours (ParticipACTION, 2018). These age groups spend 2.3 hours (5-11 year olds) and 4.1 hours (12-to 17-year olds) engaged in recreational sedentary behaviours (e.g., watching television, text messaging, video games) per day (ParticipACTION, 2018). The increased time engaged in sedentary behaviours is concerning, in that it takes away from time that could be spent being physically active, and increased sedentary behaviour poses a health risk independent of MVPA levels

(ParticipACTION, 2018; Tremblay, Colley, Saunders, Healy, & Owen, 2010). Regular engagement in PA helps to reduce depressive symptoms and anxiety in children and also enhances their stress responses, resiliency, self-esteem, self-concept, and self-perception (ParticipACTION, 2018; Tremblay et al., 2010). In turn, positive functioning in these areas can promote better moods, increase life satisfaction, and minimize negative impacts of stress (Chaddock et al., 2012; Reddon, Meyre, & Cairney, 2017; Schaeffer et al., 2014). Participating in PA, such as sports, helps to develop positive physical, psychological, and social functioning (Chaddock et al., 2012; Schaeffer et al., 2014). Children who play sports are more likely to continue engaging in PA into adulthood (Statistics Canada, 2012). Unfortunately, significant declines in sport participation have been reported as children transition into adolescence, with a sharper decline noted in females' participation rates than males' at this life stage (Statistics Canada, 2012). If a female has not participated in a sport (organized or individual) by the age of 10, there is only a 10% chance that she will be physically active as an adult (Statistics Canada, 2012).

Children whose parents are active are more likely to be active themselves (Colley et al., 2011). Surprisingly, only 38% of Canadian parents with 5- to 17-year-olds report playing active games with them (Statistics Canada, 2012). In addition, parents' own PA engagement is very important. As noted by Garriguet, Colley, and Bushnik (2017), who studied a sample of over 1,300 parent-child pairs, every 20-minute increase in parental MVPA was associated with 5- to 10-minute increases in the MVPA of their 6- to 11-year-old children, independent of parental support for PA. Interestingly, only 16% of Canadian adults meet the current guidelines of 150 minutes of MVPA per week (Canadian Fitness and Lifestyle Research Institute, 2011).

In addition to their deficits in PA levels, one in five Canadian children (ages 1-8) have energy intakes that exceed their energy needs (Health Canada, 2012a). Inadequate nutrition in children can lead not only to the development of obesity, and its associated diseases, but also can impact brain development, leading to psychosocial and behavioural problems (Garriguet, 2009; Rao, Asha, Ramesh, & Rao, 2008; World Health Organization, 2004). Among Canadian adults aged 19 and over, 50% of women and 70% of men have energy intakes that exceed their needs (Health Canada, 2012b). Foods that are high in sodium, free sugars (i.e., added sugars), and saturated fat – deemed nutrients of concern— contribute to an increased risk of chronic diseases when consumed in excess (Government of Canada, 2019). Examples of these foods include cheese, red meat, sugar-sweetened beverages, and pre-packaged meals (Government of Canada, 2019). In 2017, 58% of all Canadians consumed sodium above the recommended limits, and 1 in 2 Canadians consumed higher than recommended levels of saturated fat (Government of Canada, 2019).

As previously outlined, parents and the home environment are key influences on the development of children's health habits (Golan & Crow, 2004; Lioret et al., 2012). Parents/caregivers can affect children's eating behaviours by making nutritious food choices for the family, modeling dietary choices and patterns, and using feeding practices to reinforce the development of eating patterns and behaviours (Golan & Crow, 2004; Lioret et al., 2012). Eating behaviour is taught through parental examples – and children's intake of fruits, vegetables, and milk often increases after observing adults consuming those foods (Birch, Savage, & Ventura, 2007; Young, Fors, & Hayes, 2004). Food parenting practices are strategies parents use to influence the amount and types of foods their children eat (Birch et al., 2007; Young et al., 2004). Role modeling healthy eating behaviours, involving children in food decisions, and

encouraging a balanced and varied diet are feeding practices parents must be made aware of, as those habits have been associated with healthy diets and body mass indices (BMI) in children (Vaughn et al., 2016). Given that parents play a formative role in shaping their children's health behaviours, it is imperative to provide parents with effective resources and supports aimed at raising awareness and increasing knowledge to enhance healthy behaviours in themselves and their families (Vaughn et al., 2016).

Parental motivation to engage in program tasks has been a large determinant of the success of health promotion interventions for parents and their children (Wolfenden et al., 2012). Motivation has been conceptualized as an individual's readiness to change a behaviour — measured as the degree to which the person feels change is important – and their level of confidence in their ability to implement that change (Miller & Rollnick, 1991; Rollnick, Mason, & Butler, 1999). In programs targeted at improving obesity-promoting behaviours in children, parental motivation has been significantly associated with: (a) the promotion of healthy behaviours (i.e., dietary and PA changes) in their children; (b) a reduction in child BMI-z; and (c) the successful completion of program tasks (Gunnarsdottir, Njardvik, Olafsdottir, Craighead, & Bjarnason, 2011; Jansen, Mulkens, & Jansen, 2011; O'Neil et al., 2010; Van Allen et al., 2014). When compared to those with high motivation, parents with low motivation at baseline of family-based behavioural treatment for childhood obesity were less likely to complete the full program (Braet, Jeannin, Mels, Moens, & Van Wincke, 2010; Gunnarsdottir et al., 2011). Goal-setting and reinforcement intervention strategies have been shown to increase parental motivation to change PA behaviour, even in the face of constraints such as time or scheduling difficulties; goal setting may provide busy parents with the additional incentive needed to prioritize their child's PA over other tasks (Brown et al., 2016). Therefore, addressing and

facilitating parental motivation to engage in healthy behaviours is important for their and their child's success in obesity prevention and treatment interventions (Gunnarsdottir et al., 2011).

In a systematic review of family-based lifestyle interventions for weight loss and weight control in children and adolescents (ages 2-19), Sung-Chan and colleagues (2011) reported that these interventions produced positive effects regarding weight loss in children with overweight/obesity, and that family played an important role in modifying the nutrition and PA behaviours of these children. This finding was supported by Brown and colleagues (2016) in their review of family-based interventions to increase PA in children, in that increases in PA behaviours by one family member prompted others in the same family to engage in activity themselves. Similarly, parents who were involved in a pedometer-based intervention, with weekly telephone calls focused on reflection and encouragement for behaviour change, reported appreciating the reinforcement they received (Jansen et al., 2011). The authors hypothesized encouragement received during telephone calls motivated parents to change their children's PA behaviours, as well as their own. The researchers of the aforementioned review (Brown et al., 2016) also found that while providing parents with health education was an effective intervention for changing PA knowledge, health education supplemented with reinforcement was *more* successful in producing behaviour change (Brown et al., 2016).

One method that has potency in eliciting positive improvements in behaviour change in various areas (e.g., smoking cessation; obesity treatment; mental health; Fried & Irwin, 2016; Mantler, Irwin, Morrow, Hall, & Mandich, 2015; Newnham-Kanas, Irwin, & Morrow, 2008; Pearson, Irwin, Morrow, & Hall, 2012) is Co-Active Life Coaching (CALC; Kimsey-House, Kimsey-House, Sandahl, & Whitworth, 2018). This primarily telephone-based method is a specific style of life coaching that centers on viewing clients as the expert in their own lives. The

coach's role is to assist the client in deepening their understanding of themselves and/or moving toward meaningful actions of their choosing (Kimsey-House et al., 2018). This method of coaching allows clients and coaches to work collaboratively, not necessarily to focus on specific behaviours, but on any area of the client's interest, which often result in behaviour changes. Previous research studies utilizing CALC as an intervention for obesity among adults have demonstrated significant improvement in physical and psychological outcomes (Newnham-Kanas et al., 2008; Pearson et al., 2012).

Study Purpose

The purpose of this study was to identify the impact of a coaching plus health education intervention compared to health education only on: (a) the PA levels and dietary intake of children (ages 2.5-10) and their parents with overweight/obesity; (b) parental motivation to engage in healthy behaviours; and (c) parental body composition (i.e., BMI and waist circumference). Parents' perspectives of how the intervention(s) influenced their own, their children's, and their family unit's nutrition and PA behaviours were explored, in addition to their perceptions of what would have made the program more effective for behaviour change.

Method

Design

A concurrent mixed methods study comprised of a randomized controlled trial and a descriptive qualitative design was utilized as the analytical framework for this study. Utilizing this type of mixed methods research design, in which both qualitative and quantitative data are collected, allows for both types of data to complement and supplement each other (Shannon-Baker, 2016). This permitted the researchers to gain a more complete understanding of

participants' experiences, which could not have been obtained by employing only one approach (Shannon-Baker, 2016).

Parent-child dyads were randomly assigned to either: coaching plus health education (intervention) or health education alone (control). Ethical approval was received from the host institution's Health Sciences' Research Ethics Board (ID# 109219). The methods pertaining to the protocol and a complete intervention description have been published elsewhere (Karmali et al., 2019). However, as the current study progressed some necessary adjustments were made to the protocol; thus, a brief procedural account is described below.

Participants and recruitment. Individuals were recruited through flyers, Facebook and Twitter posts, Kijiji advertising service site/s, a local radio advertisement, and advertisements in neighborhood and parent-focused magazines. To be eligible for this study, parents/guardians were required to have a BMI of $\geq$ 25 kg/m^2, live with their child (ages 2.5-10) for at least 5 days/week, speak English, and be comfortable using a computer for data collection. Recruitment and enrollment occurred from August 2017-November 2018. Once a parent-child dyad was determined as eligible to participate, a baseline appointment was made to obtain informed consent, conduct parent measurements, inform the parent of group assignment, and provide the dyad with pedometers. All dyads consisted of one parent and one child; the participating parent received the intervention and/or health education.

The current study employed an active control group, in which participants received health education, as opposed to utilizing a no treatment control. This decision was made on ethical grounds (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council, 2018), in order to provide parents who wanted to make changes in their and their children's behaviours with

resources that *may* help them do so. Researchers have reported that health education alone is an effective method to enhance knowledge toward behaviour change (Beech & Klesges, 2003; Chen, Weiss, Heyman, & Lustig, 2009). Moreover, from a health promotion perspective, providing individuals with knowledge to make healthy choices would allow them to increase control over their own health (World Health Organization, 2019). Therefore, health education was selected as an appropriate active control condition for this research.

Health education modules (webinars). Parent-participants in both the control and intervention groups received six evidence-informed (e.g., Amisola & Jacobson, 2003; Canadian Society of Exercise Physiology, 2018a; 2018b; Health Canada, 2017a) online health education (designed to be approximately 20-30 minutes each) sessions (or webinars) in module format. Three sessions focused on PA and lifestyle behaviours (i.e., benefits of PA, guidelines, sedentary behaviour, sleep, physical literacy, ideas for increasing PA in daily lives of parent and child, and local resources to help increase PA), and three sessions focused on nutrition (i.e., understanding nutrients and nutrition labels, eating with children, positive food environments, barriers to healthy eating, and healthy eating on a budget). Once participants joined the study, the modules were made available on the host university's eLearning platform. Parents were asked to engage in their next lesson approximately 7-10 days after their previous one.

CALC plus health education intervention. Parent-participants in this intervention group received CALC in addition to the health education modules. Participants received nine, 20-30 minute, one-on-one, telephone-based coaching sessions (three/month for 3 months) focusing on the agenda of the parent's choosing. The lead researcher randomly paired parent participants with a Certified Professional Co-Active Coach (CPCC) and together they scheduled their sessions. The agenda for each session was determined by the parent, and the coach was asked to

use only their CPCC skills – for instance, asking genuinely curious open-ended questions, reflecting back what the participant says, acknowledging the participant's experience, and championing their progress (Kimsey-House et al., 2018).

Certified Professional Co-Active Coaches. Sixteen CPCCs were invited to deliver the intervention; of those invited, 12 agreed to coach in this study. Upon participant enrollment, coaches were assigned one to three participants – based on how many parents each coach identified as suitable for them. Coaches received an honorarium.

Data collection. Rolling recruitment was employed, making the data collection periods tailored to each participant. Data were collected at baseline (i.e., 1 week prior to the start of the intervention); mid-intervention (i.e., 6-weeks into the intervention); immediately post-intervention (i.e., 3 months after the intervention began); and finally, at 6 months post-intervention. Parent participants were asked to complete demographic information forms on behalf of themselves and their child at baseline. Both groups completed the same assessments at each follow-up period. The lead researcher and a research assistant conducted baseline and follow-up assessments at either the host university or at the participant's home. One week prior to follow-up times, an email link was sent to parent participants asking them to complete the questionnaires, and email, text message, and telephone reminders were sent 1 and 2 weeks later if no response was received. If a participant could not be contacted after three consecutive communication attempts, they were contacted again at their next follow-up time, and if no response was received at that point, it was assumed that they were withdrawing from the study. A grocery store gift card was provided to dyads who completed the study.

Measures

Pedometer and 24-hour food recall (parent and child). At each assessment point, parents and children were asked to wear a pedometer for one week (including weekdays and weekends). In addition, parents were asked to track their and their child's food intake for a full 24-hours, in as much detail as possible (e.g., portion sizes, brand). To calculate parent and child nutrient consumption at each time-point, dietary recall records were entered into a food processing computer program (The Food Processor, Nutrition and Fitness Software, ESHA Version 11.3.285). Trained nutrition students reviewed all food records to ensure accuracy of foods and portion sizes. After consulting with qualified dieticians at the host university, the following nutrient intakes were chosen for analysis in parents and children: protein, fibre, saturated fat, and sodium. Total caloric intake was analyzed in parents only, as it was suggested that this is not an impactful measure in child populations.

Height, weight, and waist circumference (parent). The lead researcher and a research assistant conducted parental anthropometric measurements at each assessment time. This consisted of measuring height and weight (to calculate BMI), and waist circumference. Weight was measured using a SECA 803 digital floor scale, and height was measured using the SECA 207 mechanical stadiometer (at the host institution), or the SECA 217 portable stadiometer (for at-home follow-ups). Waist circumference measurements were obtained following Heart and Stroke Foundation (2019) guidelines, whereby the measuring tape is placed at the midpoint between the bottom of the ribcage and the iliac crest along the ancillary line.

Standardized and validated questionnaires (parent). Parents were asked to complete standardized and validated questionnaires at each assessment point, which were available on the online survey software, Qualtrics. The International Physical Activity Questionnaire (IPAQ; Craig et al., 2003) is a self-report measure of time spent performing physical activity (in

metabolic equivalent [MET] minutes) and time spent sitting during the week. The IPAQ short-form was used in this research. Outlier and truncation instructions were followed. The Treatment Self-Regulation Questionnaire (TSRQ; Ryan & Connell, 1989) is utilized to assess different forms of motivation as they relate to engaging in PA and a healthy diet. It is comprised of three subscales: (a) amotivation (i.e., absence of motivation; no meaningful relation between what they are doing and themselves); controlled motivation (i.e., behaviour that is performed to obtain a reward or to avoid negative consequences; behaviour performed to avoid feeling guilty; internally controlled but not self-determined); and (c) autonomous motivation (behaviour that is positively valued by the individual; behaviour is perceived as being part of the larger self and connected to other values and behaviours that may or may not be health related; self-determination that underlies behaviours that are engaged in for interest and pleasure from performing them). The TSRQ is measured on a Likert scale of 1 (not at all true) to 7 (very true), with higher scores indicating higher motivation (Levesque et al., 2006).

In-person interviews (parent). To best understand changes in experiences through the duration of this program, semi-structured, one-on-one interviews were conducted with parents at each follow-up assessment. Open-ended questions for the qualitative interviews (Table 1) were derived based on previous coaching studies (Newnham-Kanas, Morrow, & Irwin, 2011; Pearson, Irwin, Burke, & Shapiro, 2013), as well as the researchers' expertise, to garner parents' perceptions of how the interventions impacted them, their child, and their families, as well as program aspects that would have been more effective in eliciting behaviour change.

Baseline interviews were conducted to understand motivations for joining this study, and because these data fall outside the purpose of this paper, the findings are presented elsewhere (Karmali et al., manuscript in preparation). Qualitative findings included in this paper outline

parents' perceptions of the impact of the program over time on the aforementioned outcomes, and program improvements that would have been more effective for behavior change. Thus, themes from mid-, post-, and 6-months post intervention are presented. The lead researcher conducted the audio-recorded interviews that were transcribed verbatim, and a research assistant also took notes.

Table 1

Interview Questions

- Please give us feedback on this program, positive or negative, about your experiences so far
    - Please elaborate on what has assisted with behaviour change and what has not
- What did you like best about the program?
    - What parts of the program did you find most helpful, and why?
- What did you not like about the program?
- Thinking back to before you started the program compared to now:
    - What impact do you think the program has had on the physical activity behaviours of your child (the one who is registered in the study)?
    - What impact do you think the program has had on your physical activity behaviours?
    - What impact do you think the program has had on the physical activity behaviours of your family, as a whole?
    - What impact do you think the program has had on the dietary intake/nutrition of your child (the one who is registered in the study)?
    - What impact do you think the program has had on your dietary intake/nutrition behaviours?
    - What impact do you think the program has had on the dietary intake/nutrition behaviours of your family, as a whole?
    - What would you say is the most important thing you learned from being in the program?
    - If we were to provide this program again, what recommendations would you have for any changes we should make?
    - What else do you want us to know about your experience with the program and how it has influenced you, your child, and your family?

Analysis

Due to high participant drop out, as presented below, and some participants not completing questionnaires at each time point, there was substantial missing data in all data sets. For these

reasons, a mixed effects model was considered as the analytic method of choice, as this allows for the use of all available data (Jennrich & Schluchter, 1986).

A linear mixed effects model was utilized, with group (intervention versus control), and time (baseline, mid-intervention, post-intervention, and 6 month follow-up) entered as fixed effects to explore the impact of the coaching intervention (as compared to education only) on: parent and child step counts and dietary intake; parental BMI and waist circumference; and IPAQ and TSRQ scores. Each of the dependent variables were evaluated within separate models. A linear mixed effects model was deemed appropriate for this analysis as it reduces concerns regarding missing data on the dependent variables (i.e., the analysis uses all available data without the need for interpolation). Per-comparison alpha was adjusted for multiple comparison bias (i.e., when comparing the results to an alpha of 0.01). One participant was a significant outlier, in terms of caloric intake, throughout the study and was removed from the analysis at the outset. All statistical analyses were performed using R version 3.6.1 (R Core Team, 2019), with linear mixed effects analyses conducted using the lme4 (Bates, Maechler, Bolker, & Walker, 2015) and lmerTest (Kuznetsova, Brockhoff, & Christensen, 2017) packages. Post-hoc comparisons amongst the time periods were assessed using the emmeans package (Lenth, 2019).

Interviews were transcribed verbatim, and two researchers independently completed inductive content analysis to identify common themes (Patton, 2015). Strategies employed to uphold data trustworthiness are presented elsewhere (Karmali et al., 2019). Due to the differences in ‘treatment’ received by control and intervention groups, interviews were analyzed separately at each follow-up time point. Although quotations may be relevant to more than one theme, they are presented in the section in which the quote best fits.

Results

In total, 50 parent-child dyads enrolled in this study; the majority of parents and children were female and the average age was 37 (6.7) years and 6.8 years (2.8), respectively. Demographics for these individuals can be found in Table 2. Due to attrition, all participants did not complete assessments at every follow up time (i.e., 6-week, $n = 34$; post-intervention, $n = 29$; 6-month, $n = 19$). Site statistics showed that 68% ($n = 17$) of intervention group parents and 80% ($n = 20$) of control group parents accessed the health education webinars. For full outline of retention and attrition, see CONSORT diagram (Figure 1).

Table 2

Demographic Characteristics of Parent-Child Participants

Participant Characteristic (Baseline)	N	%	Mean	SD
Parent Sex				
Male	3	6		
Female	47	94		
Parent Ethnicity				
Caucasian	43	86		
African Canadian	2	4		
Latin-American	2	4		
Asian	1	2		
Other	2	4		
Parent BMI (kg/m^2)			36.1	7.3
Parent Waist Circumference (inches)			44.0	5.6
Parent Education (Highest level completed)				
Secondary/High School	6	12		
College	20	40		
University	17	34		
Graduate School	7	14		
Family Situation				
Single-parent	8	16		
Double-parent	42	84		
Number of people in household				
2	0	0		
3	12	24		
4	26	52		
5	6	12		
6	5	10		
7 or more	1	2		
Annual				

Household Income				
Less than $20,000	1	2		
$20,000 - $39,999	7	14		
$40,000 - $59,999	5	10		
$60,000 - $79,999	10	20		
$80,000 - $99,999	4	8		
$100,000- $119,999	3	6		
$120,000- $149,999	10	20		
> $150,000	5	10		
Prefer not to answer	5	10		
Child Sex				
Male	18	36		
Female	32	64		
Child Age			6.8	2.8
Child Ethnicity				
Caucasian	39	78		
African Canadian	4	8		
Native/Aboriginal	1	2		
Latin-American	2	4		
Asian	1	2		
Other	2	4		

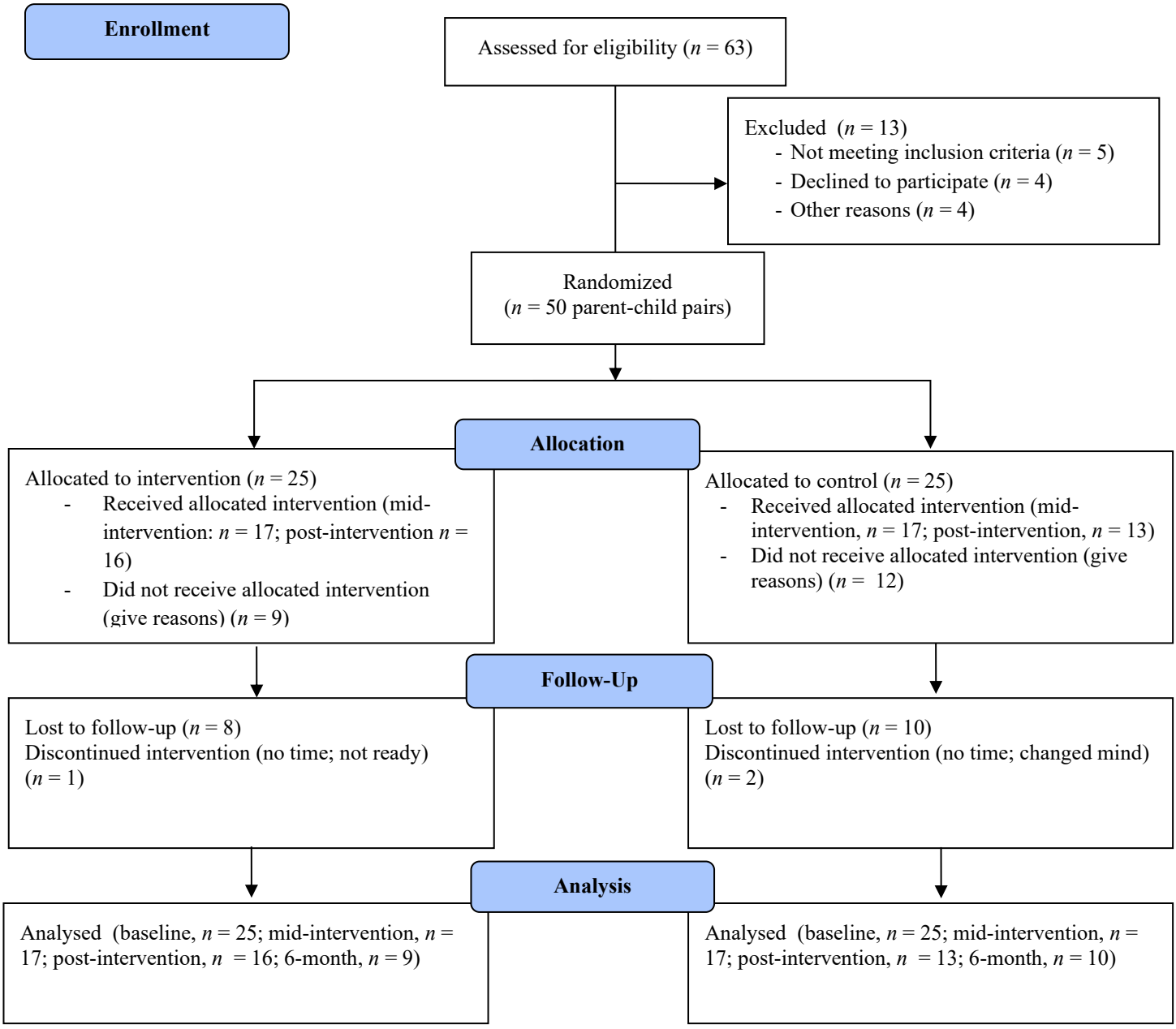

Figure 1: CONSORT diagram showing retention and attrition in current study

Quantitative Results

Given that there were only three males, the researchers opted to control for sex effects through the application of homogeneous subset selection (i.e., only female participants were selected for quantitative analysis). Thus, these results should only be generalized to female parents. No participants were deleted from the child data set.

Child PA and dietary intake. Results from children's PA and dietary intake are presented in Table 3. These included steps per week, protein intake, fibre intake, saturated fat intake, and sodium intake. The main effects model demonstrated no significant difference from the null model over time on: children's step count, children's protein intake, children's fibre intake, children's saturated fat intake, or children's sodium intake. The interaction model also demonstrated no significant difference from the null model, suggesting that there was also no effect of the intervention over time on the aforementioned outcomes.

Table 3

Child Nutritional Variables and Step Count for Intervention and Control Groups, at Baseline, Mid-Intervention, Post-Intervention, and 6-Month Follow-Up

	Intervention Group Baseline	Intervention Group 6-week	Intervention Group Post	Intervention Group 6-month	Control Group Baseline	Control Group 6-week	Control Group Post	Control Group 6-month
Mean steps (SD)	6830 (1782.55)	10371 (6884)	11179 (4323)	9259 (2072)	11671 (4264)	10741 (3520)	11016 (4700)	10537 (4981)
Protein, g (SD)	59.5 (17.3)	64.1 (25.1)	75.3 (24.2)	50.2 (10.8)	75.9 (23.5)	67.8 (23.4)	69.7 (20.9)	71.8 (14.8)
Fibre, g (SD)	17.7 (13.1)	15.9 (6.5)	15.6 (3.8)	15.2 (8.1)	17.9 (9.2)	15.9 (7.8)	17.7 (7.8)	18.9 (6.1)
Saturated Fat, g (SD)	17.9 (5.5)	25.7 (14.5)	17.2 (8.0)	23.9 (26.0)	21.4 (8.8)	16.7 (10.9)	20.7 (16.6)	26.5 (16.1)
Sodium, mg (SD)	2204.1 (806.3)	2467.0 (1498.3)	2119.9 (608.9)	2848.1 (1874.7)	2551.9 (1016.26)	2306.7 (2113.08)	2904.1 (2275.6)	2698.2 (1343.7)

Parent PA, dietary intake, and anthropometric variables. Parental PA outcomes from each follow-up point are presented in Table 4, including step count (over the course of one week), BMI, waist circumference, IPAQ MET minutes per week, and sitting minutes per day.

Table 4

Parental PA & Anthropometric Variables for Intervention and Control Groups, at Baseline, Mid-Intervention, Post-Intervention, and 6-Month Follow-Up

	Intervention Group Baseline	Intervention Group 6-week	Intervention Group Post	Intervention Group 6-month	Control Group Baseline	Control Group 6-week	Control Group Post	Control Group 6-month
Mean steps (SD)	6381 (1731.8)	7396 (2531)	8700 (6053)	5871 (1341)	6550 (2726)	6805 (2270)	7677 (1896)	10331 (5021)
Mean BMI (SD)	36.7 (7.6)	37.3 (8.4)	36.7 (8.4)	34.8 (7.8)	35.8 (7.3)	36.5 (8.5)	35.9 (9.6)	36.8 (8.9)
Mean Waist Circumference, inches (SD)	44.1 (6.2)	43.5 (6.4)	43.8 (7.2)	42.6 (6.9)	43.7 (5.6)	43.5 (6.2)	42.9 (7.1)	43.9 (6.6)
IPAQ MET Mins Per Week (SD)	1113.6 (1009.6)	1894.8 (1600.0)	1603.8 (773.3)	1436.4 (347.1)	1948.4 (1451.1)	2920.2 (2084.5)	2044.5 (1095.2)	2394.0 (1497.1)
IPAQ Sitting Mins Per Day (SD)	261.8 (181.3)	580.0 (1340.8)	240.0 (144.7)	285.0 (79.9)	354.6 (247.8)	328.9 (210.8)	326.4 (108.8)	222.0 (176.8)

The main effects model demonstrated no significant difference from the null model on parental: BMI, waist circumference, steps per week, IPAQ MET minutes, or IPAQ sitting minutes per day. The interaction model demonstrated no significant difference from the null model, suggesting that there was no effect of the intervention over time on parental: BMI, waist circumference, number of steps per week, or IPAQ sitting minutes per day.

Parental nutritional outcomes from all follow-up points are presented in Table 5, including caloric intake, protein, fibre, saturated fat, and sodium.

Table 5

Parent Nutritional Variables for Intervention and Control Groups, at Baseline, Mid Intervention, Post Intervention, and 6-Month Follow-Up

	Intervention Group Baseline	Intervention Group 6-Week	Intervention Group Post	Intervention Group 6-month	Control Group Baseline	Control Group 6-week	Control Group Post	Control Group 6-month
Calories (SD), kcal	2026.5 (753.3)	1833.9 (1741.7)	2012.8 (622.3)	1810.5 (730.3)	2256.8 (557.9)	1884.3 (561.2)	1741.7 (438.4)	1660.2 (381.4)
Protein (SD), grams	82.1 (34.8)	86.6 (34.8)	107.1 (37.9)	70.7 (31.9)	98.1 (37.3)	94.7 (31.3)	88.4 (22.9)	98.9 (33.9)
Fibre (SD), grams	24.1 (18.2)	24.7 (17.5)	20.8 (5.7)	19.5 (7.8)	22.6 (10.4)	23.6 (11.1)	18.6 (9.7)	17.1 (7.5)
Saturated Fat (SD), grams	24.8 (12.4)	27.6 (23.2)	27.4 (14.9)	30.7 (25.7)	34.0 (17.1)	21.9 (12.1)	33.4 (26.7)	28.5 (17.7)
Sodium (SD), milligrams	3380.8 (1790.3)	2670.5 (2000.8)	2617.9 (1332.0)	1942.9 (1450.6)	3659.4 (1713.3)	2450.2 (1657.7)	2766.4 (1571.7)	2468.9 (1737.0)

The main effects model demonstrated no significant difference from the null model when adjusting for multiple comparison bias (i.e., when comparing the results to an alpha of 0.01) on parental: caloric intake, protein intake, fibre intake, or saturated fat intake. The interaction model also demonstrated no significant difference from the null model on the aforementioned outcomes.

The main effects model demonstrated no significant difference from the null model, χ^2 (4) = 13.25, p = 0.01, when adjusting for multiple comparison bias (i.e., when comparing the results to an alpha of 0.01) on parental sodium intake. Similarly, the interaction model demonstrated no significant difference from the null model, χ^2 (7) = 15.09, p = 0.04, when adjusting for multiple comparison bias. It is important to note however, the trend that is present within the data (i.e., the effect 'approached significance'). To explore this, interaction plots were created (Figure 2).

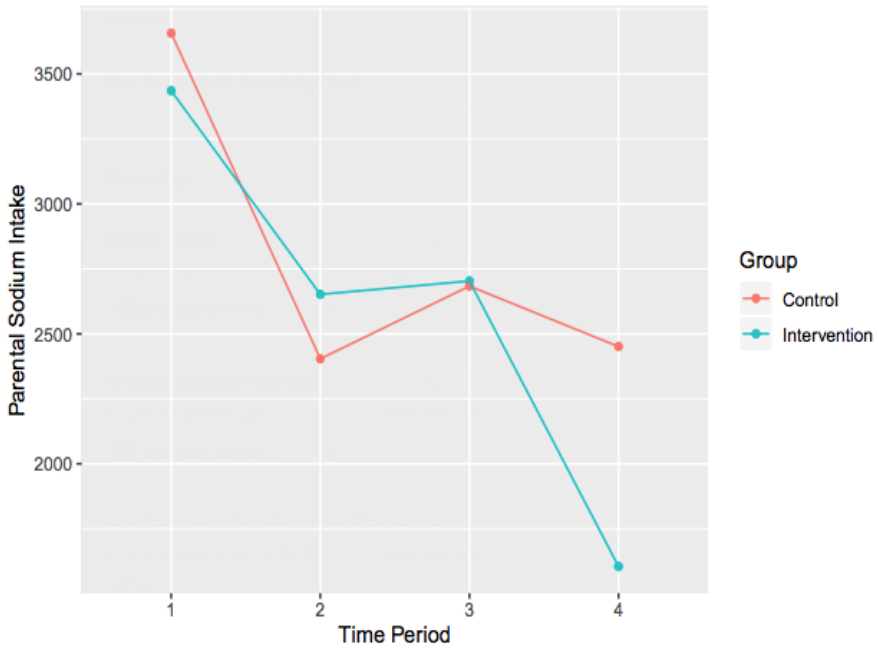

Figure 2: Interaction plot of parental changes in sodium intake over time for both control and intervention groups

Parental motivation. Parental motivation was assessed using the TSRQ. Outcomes from each follow up time, for diet and exercise, are presented in Table 6. These outcomes included autonomous motivation, controlled motivation, and amotivation.

Table 6

TSRQ Variables for Intervention and Control Groups, at Baseline, Mid Intervention, Post-Intervention, and 6-Month Follow-Up

	Intervention Group Baseline	Intervention Group 6-week	Intervention Group Post	Intervention Group 6-month	Control Group Baseline	Control Group 6-week	Control Group Post	Control Group 6-month
TSRQ Diet, Autonomous Motivation (SD)	5.9 (1.0)	5.9 (1.1)	5.6 (1.2)	5.6 (1.2)	6.0 (0.8)	5.9 (0.8)	5.7 (0.9)	6.2 (1.0)
TSRQ Diet, Controlled Motivation (SD)	3.8 (1.3)	3.9 (1.3)	4.0 (0.9)	3.5 (1.6)	3.7 (1.1)	4.6 (1.2)	3.8 (1.1)	3.6 (1.5)
TSRQ Diet, Amotivation (SD)	2.2 (1.0)	2.1 (1.2)	2.5 (1.0)	2.5 (1.4)	2.4 (1.1)	2.5 (1.4)	2.3 (1.2)	2.0 (0.9)
TSRQ Exercise, Autonomous Motivation (SD)	5.9 (1.3)	5.8 (1.5)	5.8 (0.9)	6.0 (1.0)	6.0 (1.0)	5.6 (1.0)	5.6 (1.1)	6.0 (1.3)
TSRQ Exercise, Controlled Motivation (SD)	3.5 (1.2)	3.8 (1.1)	3.9 (1.3)	3.6 (1.2)	3.6 (1.5)	4.2 (1.2)	3.8 (1.4)	3.6 (1.5)
TSRQ Exercise, Amotivation (SD)	2.1 (1.3)	2.2 (1.2)	2.6 (1.6)	2.9 (1.3)	2.1 (1.2)	2.6 (1.4)	2.4 (1.9)	1.7 (1.0)

The main effects model demonstrated no significant difference from the null model on: diet autonomous motivation, diet controlled motivation, diet amotivation, exercise autonomous motivation, exercise controlled motivation, or exercise amotivation. The interaction model also demonstrated no significant difference from the null model, suggesting that there is no effect of the intervention over time on the aforementioned outcomes.

Qualitative Findings

Qualitative interviews with parents resulted in a vast number of supporting statements (N_{words} = 13,028, approximately), far more than could be included in the current manuscript. Duration of interviews varied at each follow-up time: 5-41 minutes (mid); 5-57 minutes (post); and 6-39 minutes (6-months). Data saturation was reached for each time point. To avoid repetition, themes and/or subthemes that were unique to each follow-up point are presented and described. For a complete outline of themes, organized by group and follow-up time, see Figures 3 and 4.

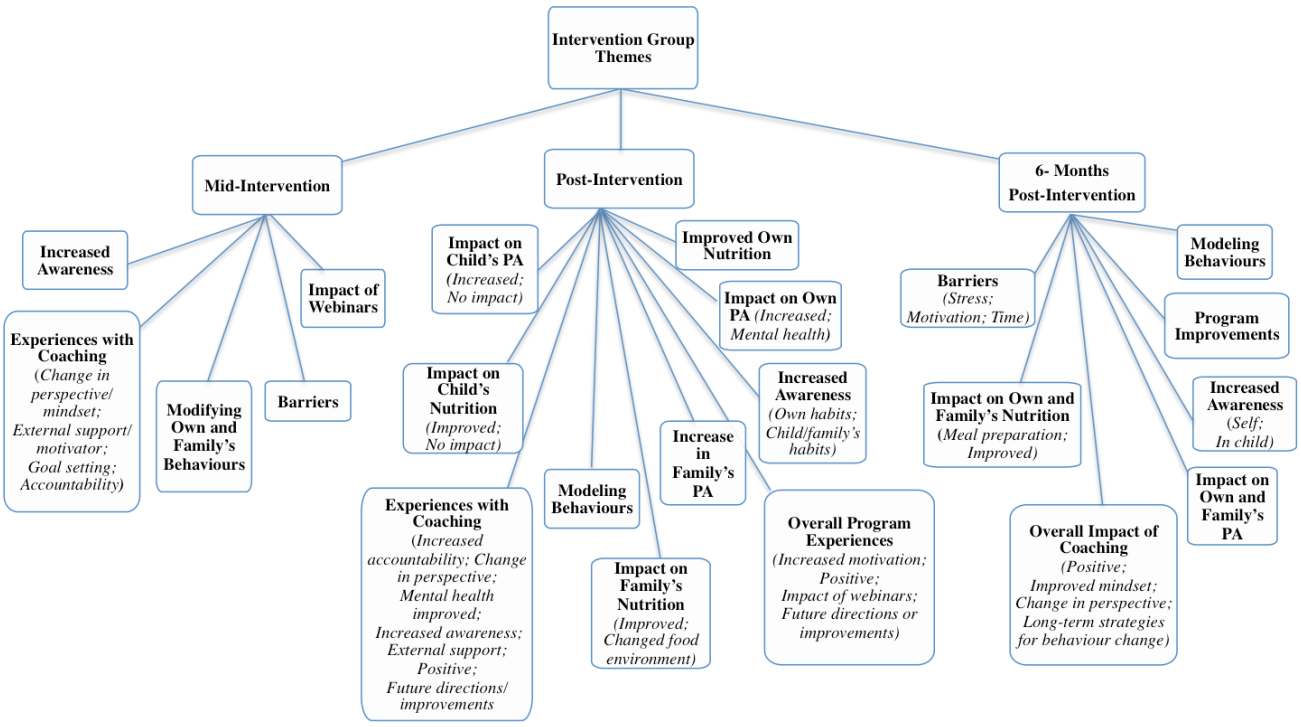

Figure 3: Intervention themes from all relevant time points

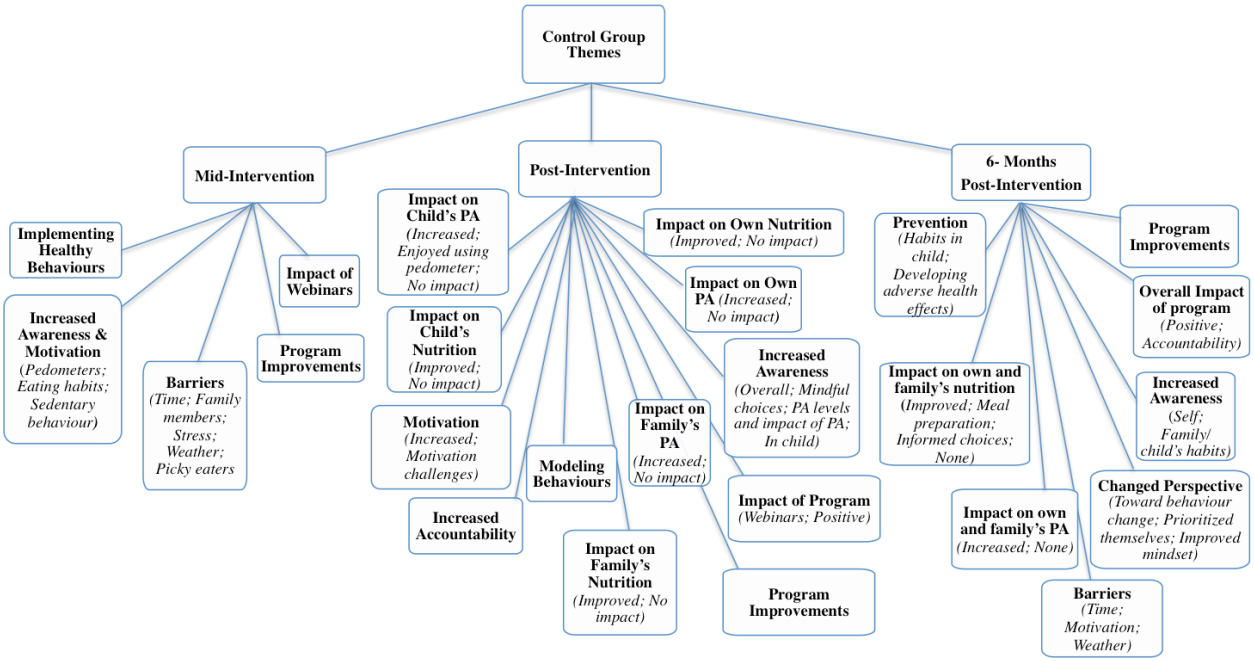

Figure 4: Control themes from all relevant time points

Mid-Intervention Themes

Intervention group themes. Five themes and four sub-themes were identified from mid-intervention follow-up interviews with intervention group participants (n = 17) with regard to impact of, and experiences in, the program. Corroborative quotations for each theme can be found in Table 7.

Experiences with coaching. Most participants in the intervention group expressed that, at the 6-week mark, coaching had positively impacted their lives. They described developing changes in their perspectives toward behaviour change; the benefit of having an external supporter or motivator; improvements in goal setting skills; and experiencing increased accountability to themselves and their coaches. For a full explanation of participants' experiences with coaching, as well as coaches' perspectives, and corroborative quotations please see Karmali and colleagues (under review).

Increased awareness. Parents described an increase in awareness of their and their child's habits, as well as their reasons for engaging in unhealthy behaviours. Many participants expressed that they turned to unhealthy foods when they were stressed or when they were having a bad day, and some mentioned that the foundation of their unhealthy nutrition habits stemmed from experiences in their childhood. They became more aware of the importance of engaging in self-care, and how focusing on their mindset led to improvements in other areas of their lives. Overall, participants expressed that though coaching sessions did not necessarily centre on nutrition and PA, they realized that improving their mental health resulted in improving their habits and behaviours. In addition, participants became more aware of their and their children's PA habits through the pedometers. Some parents realized that their children were gaining higher step counts during the week when they were at school or daycare and fewer on the weekends. In addition, they became more aware of their own number of steps taken per day, as well as their levels of sedentary behaviour.

Modifying parental and family behaviours. Participants spoke about changes they made for themselves, and within their households. This included increasing the amount of fruits and vegetables they gave their children, as well as altering the types of foods and snacks they consumed themselves. In addition, participants started to increase their own engagement in PA, via walking, yoga, circuit training, skipping, and going to the gym. In some cases, these activities were done with their children.

Impact of webinars. Parents in the intervention group explained the impact of the educational webinars on their behaviours. Many said that they felt they already knew most of the information that was provided. Others said that they learned new information regarding nutrition

labels, percent daily values, physical activities for their children, and about how food should not be used as a reward.

Barriers to behaviour change. Those parents who spoke about barriers explained that barriers prevented them from changing their current behaviours; these included weather, lack of time, and cost. They also felt they didn't have enough time to exercise, that weather prevented them from being active outdoors, and gym memberships and healthy foods were too expensive.

Table 7

Corroborative Quotations for Mid-Intervention Themes and Sub-themes (Intervention Group)

Increased Awareness
"…The coaching aspect has definitely [made] a big difference for me. Because I can read the module, and then for a day I really think about it, or the days where, you know, I have to check the steps, I'm much more conscious of it, of, 'Okay, I've got to do this.' I want [my children] to be active, you know, I want to be on it. Or when I had to write down my food, I thought about it a lot more."
Modifying Own and Family Behaviours
"I think that my nutrition's changing … in e the options that I'm picking, 'cause I have to eat certain amounts of carbs, but it's trying to make those healthier options of what type of carbohydrates I'm eating. Like, having a piece of bread or vegetable or fruit instead. … Is a much better option than having a bowl of cheezies. … I have to have a snack every night I'll have a peanut butter sandwich instead of a bowl of chips."
Impact of Webinars
"The biggest [learning] … that was impactful for me was going into the grocery store and reading the ingredients a little bit more. … You see things like 20 percent or 5 percent, and it didn't mean anything to me [before completing the webinars]."
"I really like some of the tips for handling the issues…with children and eating… The idea of not giving them food when they're upset… was interesting to me and the way it was described [I] was like, 'Yeah that makes sense.' If you feed them when they're upset then they learn that food just makes them feel good… I can see how that would lead to emotional eating."
Barriers
"I think over the winter … some of [webinar] ideas will be good, because we're kind of stuck inside now. … That's where we kind of get … lazier. So I think just doing different activities inside and stuff will be really good."
"[If] I went to the YMCA that's closest to me now I'm gone for over an hour to go to a

class that's 30 minutes. … It's just a lot to take out of your day when you have two young kids at home."
"So, if you are buying a lot [of healthy food], that adds up. Same with every single fruit. … even the ones that are not organic [are] expensive. The meat went through the roof, certain spices [are] way… too expensive."

Control group themes. Five themes and eight subthemes emerged at mid-intervention from interviews with parents in the control group (n = 17) regarding impact of, and experiences in, the program. Corroborative quotations for each theme can be found in Table 8.

Increased awareness and motivation. Parents in the control group explained that the pedometers made them aware of how much daily activity they and their children were acquiring. Many said that their children thoroughly enjoyed tracking steps, particularly because they would compete with their participating parent. Children, according to some parents, felt motivated to gain more steps when they realized that their step count numbers were higher than their parents'. Parents also began to take notice of the amount of screen time in which their children were engaging. Similar to the intervention group, parents in the control group expressed that they were surprised to learn how few steps they acquired on certain days and were also more aware of how much time they spent in sedentary behaviours. It was also shared that the dangers of prolonged bouts of sitting came as a shock to some participants. In addition to heightened awareness of PA habits, participants started to make changes to their and their family's nutrition. They noticed the types of foods their children were consuming. Some parents explained that their motivation to change stemmed from realizing that their unhealthy habits not only affected themselves, but their families as well. In addition, the impact of modelling behaviours was also realized.

Implementing healthier choices. Parents described changes they started to make for themselves, and in their households. Some explained that they had resisted the temptation to buy fast foods, others said they began introducing more fruits and vegetables into their homes, and

some described that they were switching unhealthy food choices for healthier ones (e.g., carbonated water instead of soda pop). Many parents also said that they had removed unhealthy treats from their homes and had decreased sugary snacks from their children's diets. Some parents noticed the positive impact healthy eating was having on their and their child's mindset in that they perceived their children as feeling better, having improved concentration, higher energy, and presenting with less agitation. Participants expressed that they had been making a conscious effort to increase their daily PA by bike riding, increasing their walking through parking further away from destinations, or taking the stairs more frequently. Some parents shared the information from the education sessions with their partners and/or families. They began involving their children in cooking and increasing PA with their families (e.g., going for walks together).

Impact of webinars. Similar to those in the intervention group, members of the control group reported that the education sessions were a refresher of information they mostly already knew. They explained that though they knew the information, they found it helpful and appreciated having reminders of what healthy habits entail regarding PA and nutrition. Some parents expressed that they learned new information from the webinars such as reading nutrition labels and differences in serving sizes.

Barriers to behaviour change. Some participants in the control group described that because there was no accountability piece for them and the webinars were self-led, they forgot to continue accessing them. A few participants explained that they had difficulty finding time to complete the webinars because they felt daily life was too hectic. Others spoke about barriers including picky eaters in their families and unsupportive partners who did not want to change their dietary habits. In addition, some parents noted that the weather prevented them from being

more active, and that other family members made unhealthy foods too available to their children (e.g., grandparents).

Program improvements. Parents in the control group explained that, while they found the webinar information helpful, they wanted more frequent check-ins with the researchers to serve as support to keep them on track and accountable. A few parents stated that they wanted a more structured program to help them complete the webinars, as they found the self-led format challenging. The desire for assistance with addressing mental health challenges was also expressed.

Table 8

Corroborative Quotations for Mid-Intervention Themes and Sub-themes (Control Group)

Increased Awareness & Motivation

- *Pedometers*

"This [pedometer] is addictive. … I'm surprised how many more steps [my daughter] does in a day. … She was at … 16,000 where I was still at [9,000]."

"My daughter… is talking about [the program] a lot, and was very excited about the step counters, and was …Very excited to be like, 'Hey, look at how many steps I've achieved.'"

- *Eating Habits*

"I have noticed … my daughter… is a lot more active than I am currently, but I have noticed…what we're eating is starting to affect her. … my bad choices are now affecting the entire family, not just me … [A]ll of the [webinar] videos that were related to the child part of it…she watched with me. … She enjoyed that. But I think for me too, it's realizing that the choices I'm making are affecting more than just me."

"I have a job … driving around the city all day… [leading to] bad habits of going through drive-thrus… so I am now making more conscious decisions to stop at the grocery store, if I don't have a lunch … I can just get a salad or something a little more healthier. … [The program has] made me more conscious that way.

- *Sedentary Behaviour*

"[My child] loves YouTube. … So, we've always limited …screen time. But it's interesting, when [the webinar is] saying… one or two hours a day of screen time. You think about how that adds up so fast. … She's eating her breakfast, she comes home, she watches a little bit. It can easily be an hour, two hours without thinking about it. … So that's definitely something that… I pay attention to."

Implementing Healthy Behaviours

"[My child] can be a little bit of a picky eater, so [prior to joining the program] we

would end up just caving into him and giving him whatever he wanted. … So, we cut back on that."
"My husband and I have … got rid of all treats in the house, so when it's a snack … the only option available is fruit."
"…[I am] parking further away and walking and just trying to get as many steps in as possible."

Impact of Webinars
"The program itself has been good information. The videos are good …it wasn't a lot of things that I didn't already know. … But, it's good to … have the reiteration of things that I should know, but don't follow."
"I read [daily value percentages] now every time I go to a grocery store, I always check the values, I check the fat, I check everything that is not healthy, I try to stay away from that. … [Before] I wouldn't care about that much."

Barriers
- *Time*

"[L]ife is busy, so… I kind of forgot about the [webinars] and so I have to remind myself to do that."
- *Family members*

"I find it frustrating sometimes … because my husband doesn't eat vegetables. … And so, I'll try to prepare … carrots and make them a bit sweet, or try and … entice [my family] with it. … And my husband will be making a face 'cause he doesn't like it and I'm like, 'Can we not? Just like, don't influence [the children], right? Or don't say you don't like it, can you not just eat one carrot and smile?'"
- *Stress*

"I did start [eating healthy] for quite a while [during the program]. I was doing really well, and then some things changed, and there was a little bit too much stress…then I took a week off, and I realized how easy it is to fall back into bad habits."
- *Weather*

"But when it is that hot [outside], most people are staying in and kind of hibernating, because it's too hot to be out, and so we have been trying to get outside every single day, but even if it's just the backyard, but again, walking from my bedroom to the back door isn't really a lot of exercise…"
- *Picky eaters*

"I also feel like incorporating [healthy foods] in a way that [kids] don't know isn't really teaching them why it's important [to eat healthy]. … And I also wish they would just give it a chance. Cause like, I make turnips, and I use a little bit of brown sugar, and I know that the oldest would like it, it's just there's no chance [my younger child will] even try it."

Program Improvements
"I would forget about the online [webinars], just cause it's online or whatever, maybe … a reminder… every week … Just kind of like touch base and remind you that the videos are on there."
"… I think that extra accountability piece would have made a difference. Whereas, now this is the second time we're meeting, it's a couple months in, and… I know I'm accountable but not to

the extent … if I was also getting that [coaching] phone call. I would have been, like, 'Oh my gosh, they're gonna know even more.' … Not that I'm hiding anything, but… just having the extra little bit of accountability… would have been better in my situation."

Post-Intervention Follow-Up Themes

Intervention group themes. Ten themes and 21 sub-themes were identified from immediate post-intervention interviews with intervention group participants (n = 16) with regard to the impact of the program on themselves and their families. Eight of these themes and 12 sub-themes were unique to this follow-up time, and therefore will be described in detail below. Corroborative quotations for each new theme/sub-theme are presented in Table 9.

Impact on child's nutrition. Most parents explained that they felt their children's dietary intake had improved over the course of the program. Due to meal planning and making healthier foods more available in their homes, their children were making better nutritional choices than before the program. Parents reflected that their children's preferences seemed to change in that instead of craving convenience or fast foods, they were more likely to select a fruit or vegetable when they wanted a snack. They explained that, before the intervention, their children enjoyed and craved fast foods and sugary snacks. Conversely, some parents felt that their children already had well-balanced diets. Parents explained that they tried to ensure their child's habits were healthier than their own and had always made healthy food available in their homes. These parents they felt the program did not impact their child's dietary intake.

Impact on child's PA. Intervention group parents' perceptions of their children's PA levels varied; some felt levels increased while others felt there was no change. Some parents reported that children who observed their parents becoming more active began to increase their own activity as well. Parents explained that because they felt accountable for their child's PA levels, they encouraged their child to be active, and became more cognizant of their child's activity

levels. Through increasing their daily PA, children engaged in less sedentary behaviour (such as watching television) and spent more time playing outside. A few parents noted that this was a vast change compared to before the program in that their children tended to be sedentary after school and/or their extra-curricular activities. Parents also noted that their children enjoyed using the pedometers; they sensed that using pedometers encouraged higher step counts in their children. Parents felt that, from this increase in PA, their children were also motivated to join other sporting activities. Some parents felt that because their child was already active, and remained so throughout the program, their PA levels did not change. Parents opined that because their children were very active during the days, whether through daily PA or structured activities, increases in their PA due to the program were unlikely.

Improved own nutrition habits. All parents in the intervention group felt that the program made at least some impact on their dietary intake and helped them improve their nutrition behaviours. They explained that instead of choosing quick and convenient foods— as they would have done before the program— they were more likely to choose healthier foods. They became cognizant about the choices they made and implemented what they felt were manageable changes. Parents explained that meal planning and preparation helped them with making the healthier choice more convenient in that these foods were now readily available in their homes. Moreover, in making small changes in their diets, participants found their food preferences changed over the course of the program (e.g., craving less sugar).

Impact on own PA. Some parents in the intervention group noted substantial improvements in their PA levels through their involvement in the program. Participants shared that they incorporated PA into their days such that PA became a part of their routine. For instance, they would take stretch breaks at work, or, if they could not be active outdoors, they would find

indoor spaces where they could walk. Parents reported that they started to walk more in general, engaged in activities such as skipping or skating, or conducted their own exercises in their homes. As a result of engaging in higher PA levels, parents noticed that they also experienced more positive mental health than before their involvement in the program. Parents explained that the changes that they implemented became established habits for them, and that these changes translated to them feeling more positively about other aspects of their lives.

Impact on family nutrition. It was reported that intervention group families' nutrition behaviours improved through parents' involvement in this program. Parents shared that their family planned for and made meals together thereby motivating their family not only to eat healthier, but also understand the importance of doing so. Parents explained that, because their family changed their diets together, they were more likely to engage in healthy eating due to the support they felt from each other. They noted that their children's preferences for unhealthy snacks began to change, and they started to request fruits and vegetables. In addition, parents shared that their children who were not participating in the study also changed their diets and began to seek out healthy food options. Parents described that they continued to change their home food environments by ensuring their homes no longer had convenience or junk foods. They no longer bought fast food or snacks that were high in sugars or fats (e.g., granola bars); instead, they made fruits and vegetables more readily available in their homes.

Increase in family PA. Intervention group parents shared that because they began to increase their own PA levels, their family did the same. They explained that their involvement in the program helped them make PA a priority for them and their families. They started to engage in PA together, which soon became part of their routine. Some families went for walks together, whereas others set designated times to be physically active together. Parents noted that this

increase in family PA was a drastic change from their previous habits in that they and their families would have been engaging in more sedentary behaviours prior to participating in the program.

Modeling behaviours. Participating parents in the intervention group shared that the program helped them realize the extent to which their behaviours impact their whole family's behaviours. Parents explained that when they changed their behaviours, their children noticed, and did the same. Parents also felt it was important to establish healthy behaviours to ensure that their children developed healthy habits which would be more likely to continue over their lifetime. Parents reflected that they did not realize the extent to which their children observed their parents' behaviours, and through the webinars and coaching program, parents were able to make changes that benefitted themselves and their families.

Overall program experiences. Parents described that through the intervention program they increased their motivation to engage in healthy behaviours, felt the program was positive overall, explained the impact of the webinars, and also provided their feedback regarding future directions and improvements. Children and families began to increase PA levels and improve dietary intake upon observing these behaviours being implemented by participating parents, thereby further motivating parents to continue improving their habits. In general, parents felt the program was a positive experience and provided the momentum they needed to institute and maintain healthy behaviours. Most liked the format of the program (i.e., telephone sessions and at-home follow-ups), and others were pleased to observe positive impacts on their children's health behaviours. Some parents felt the education sessions provided them with some new information, while others felt they served as reminders of health information they already knew. Participants suggested providing printed copies of the webinars, using a different site to host the

webinars, and more structured deadlines for webinar completion dates. In addition, it was suggested that the program be offered in schools, and because of their positive experiences with coaching, parents recommended that all participants in the program should have the opportunity to work with a coach.

Table 9

Corroborative Quotations for Post-Intervention Themes and Sub-Themes (Intervention Group)

Impact on Child's Nutrition

- *Improved*

"[The program has] had a huge impact on [my child]. [W]e were always … a free feed family …the fridge is open, the cupboards are open, take what you want, when you want. [My son is] nine so what he wanted was cookies, and sugars, and sweets, and starches all the time. [W]e do so much more meal planning now than we ever did. We sit … and figure out the whole week…. [On] 'eat whatever you want Friday' … he won't eat a whole bag of cookies… which makes me happy…. [He says] 'I ate my sub I'm going to eat an apple first and then I'll have my cookie.' … Whereas before he would've been like 'can I have two? … three?' Both [of] my… children, but definitely my son [program participant], has been [making] significantly better choices."

"[T]wo weeks ago, we went to McDonald's and [my child] made a comment going 'Mommy I don't really like McDonald's anymore.' … But he used to want McDonald's all the time."

"[My child's nutrition has] changed a lot. She's looking more at what's healthy for her, compared to 'I'm just hungry and bored and wanna eat.'"

- *No Impact*

"We try to eat… a lot of vegetables, and a lot of fruit, and…we're already trying to do a lot of substitutions with a lot of vegetables, you know, tofu, beans, etc. … We've been doing that all along, so nothing's changed for her."

"I made it a goal even before the program… [to] feed [my child] better than I feed myself. … I made it a goal when she started eating sold food … to make sure that she was introduced to tons of vegetables and fruit, because it wasn't the same for me growing up."

Impact on Child's PA

- *Increased*

" [My child's behaviours] completely [changed since starting the program]. [H]e's probably watching half as much TV now as he did three months ago… and … [he's] wanting to go outside, wanting to play games, wanting to explore … anything [to be] outside more… And he was never that kid before."

[My child] sees me moving more. And she wants to participate, so … I did a 100 squat challenge every day for 30 days… and she would join in with me. … it's acceptable behaviour to her now, to move more and to exercise. [S]he'll come to me… and [say] 'it's time for exercise.'"

"[Before the program my child] was signed up for nothing, and now she's signed up for 3 things. … So she's doing karate, yoga, and skating."

- *No Impact*

"[My child] was super active before we started [the program] and she's still really active today. … I think the only thing that I've changed is that …. I'm going to be enrolling her in some more programs for exercise and things like that."

Improved Own Nutrition

"I've been… more purposeful to make extras for dinner because that's one of the healthier meals that we eat [because] we eat as a family. … So I'll make sure I'll have enough leftovers for… myself for lunch, versus eating a small bowl of chips."

"Grocery shopping has just changed. [I stick] to the outside perimeter of the grocery store versus going deep into the aisles. … [And when I'm] making muffins… I'll just throw the carrots in. … I'm sure it's not even a lot, but again, it's changing the flavour, texture, getting the taste buds more used to having the sweetness of the carrot and the pineapple in the muffin instead of the sweetness of chocolate."

"The program has definitely [had] a positive impact [on my dietary intake]. … I still struggle with stuff like eating enough fruits and vegetables. … My major goal when I was working with the coach was my sugar intake, that's what we ended up focusing on. … I realized the other day that my coffee was too sweet and I reduced how much sugar was in it by one teaspoon and then it tasted so much better. I'm losing my taste for sugar for a little bit."

Impact on Own PA

- *Increased*

"I think [what] the program did for me was [help me] understand how important my routine was and how much of an impact it was having on my life. So…the last four weeks I'm up early and working out, I'm making breakfast for my family before I get to work instead of rolling out and [saying] 'we're grabbing [fast food] today.' [Before] I would be like 'here's a donut, here's a cupcake. … And I think if I hadn't gone through the program, I think I'd still be that way."

"I'm doing more practical activity … like raking and shoveling and playing, skating, skipping, that kind of stuff. It's not that I'm going to the gym, 'cause I'll never be a gym person, is what I have learned over the years. … But [the program] has just spurred me to try and be more active so, it's … in the back of my mind all the time."

"[Because my job involves a lot of sitting] I can't incorporate a lot of walking, but I did start… parking further, in parking lots. …[When] sit[ting] in client meetings all day …started standing up, even between the meetings, and I started stretching a little bit more instead of just sitting at the desk and waiting for the next client to come."

- *Mental health*

"[My coach and I] were talking about how when I'm feeling stuck, like literally just getting up and moving your body, can snap you out of a funk."

Impact on Family's Nutrition

- *Improved*

"We're eating healthier because we are following our meal plan, we're pre-planning our meals so we know what we have in the house and that we make sure we have enough for the rest of the week because I don't want to go to the grocery store four-five times a week, now it might be twice."

"I'll just buy one of those vegetable trays from the grocery store and just put it out and [my children] eat it!"

"All the kids [love salads now]. One night… was a huge success, half [my son's] plate was just salad, just naked veggies. … And before [the program], I don't think that they would have been."

- *Changed food environment*

"I think [my family] feel[s] like they're getting a little bit more of a choice [of foods] now. Like if I call home and say we're having this and this and this, [my children will] say like 'oh can we have the green beans instead of that?'… [I say] 'sure, we can switch those.' …. [I]f I come home and I… need to then cook and then we eat, its 6:30-7:00. Whereas if [my family members] help, I get home, we eat, and then we can spend time together."

"I now go through two bags of apples a week… and two bundles of bananas. … [Before], my bananas would just kind of rot, and then I'd make banana bread."

"[We have been looking for] different [food] options. Like, the kids are even saying, 'well, that's not a good option, Mom. Let's do this one.' … So, having them buy into it is much easier. … And it's just more of a conversation we have [about healthy eating], versus mom just plops stuff in front of them."

Increase in Family's PA

"We've been skating, we do skipping, and we were out raking yesterday. So [the program] pushes me…to try and do something everyday. Whereas before there were days where… I would come home and just be too tired and we wouldn't do much at all."

"[Physical activity is] easier because now …on days when I don't feel like doing [physical activity], [my husband will] say … 'okay, are we going to go on a walk with the dog tonight' or 'we're going to take kids to the park, and on days where he doesn't feel like doing it, then I'm the one pushing him. Whereas before it was both of us …watch[ing] TV.'"

"Friday nights [used to be] pizza and a movie nights. … And chips. …[V]ersus [now it is family] gym night. … Like, that's a big change."

Modeling Behaviours

"[The program is a] reminder that everything I do in my life, my children are watching me. So whatever I'm doing that I am a model for them. So if I'm modeling very lazy lethargic behaviour, watching TV all the time, not keeping active in my lifestyle, that's what my kids are going to… think is okay and it's going to trickle down because that's what my parents were like. …[A]nd it trickled down into my life and I want to stop that now. I want my children to see what a healthy [life]style looks like."

"I'm being accountable for what [my children are] putting in their bodies. … I knew what I was buying wasn't the healthiest for them, but it was something that they like. So, I was [starting] to realize 'okay, well just because it was something they like it doesn't mean that they need to indulge in that.'"

Overall Program Experiences

- *Increased motivation*

"[The program] helped me to get the first step to being motivated to doing something … literally just moving."

- *Positive*

"I loved the fact that you guys come to the house [for follow-ups]. [Because] … I've got a kid, so … getting out of the house is a whole production."

"[The program] was just nice and… an overall reminder just to focus, slow down, look at what it is that we're doing, and in my case, it was good to reinforce that … we're doing the right things. …[Y]ou get so stuck in your routine … that you don't slow down to actually look at what it is that you're doing, and why, and is it working. So it was kind of nice to have a little bit of a review."

- *Future directions or improvements*

"I thought it was a really great program… I guess maybe if I was to say anything it would be to like give two different options to people [for the education sessions]… of being flexible, versus having … deadlines and check points. My personality is that I will either try and … rush through it at the start or … do it at the very end, but if there's deadlines I'm always committed to meeting my deadlines."

"I think there are so many more people [who] could benefit from the program …. [T]he program is so impactful for me that I think… it should be offered to every kid in school. [I]f their parents don't take it, they don't take it, but this sort of stuff needs to be taught more in our school at a younger age."

"The only recommendation was to do the webinars… an audio version of them."

Control group themes. Twelve themes, and 21 sub-themes, emerged from post-intervention interviews with parents in the control group (n = 13) regarding the impact of the program on themselves and their families. Nine themes and 16 sub-themes were unique to this follow-up time, and therefore are discussed in detail. Corroborative quotations for each new theme/sub-theme can be found in Table 10.

Increased awareness. Unique to this follow-up time, parents noted that their children who participated in this program increased their own awareness regarding healthy habits. Children, it was reported, noticed changes in their parents' behaviours, and also started to make more mindful, healthy food choices as a result of seeing their parents do the same. Parents explained that they were not aware of the extent to which children noticed and engaged in the same behaviours as their parent.

Impact on child's nutrition. Control group parents described that the impact of the program on their child's nutrition behaviours varied. Some noted that their child's nutrition improved in that fast foods and treats were limited, more fruits, vegetables and salads were introduced into

their child's diet, and food substitutions were made. For instance, one parent described substituting flour with oatmeal and bananas in pancakes. Many parents described that these changes were made without their child noticing. Parents also began to explain healthy eating to their child, and the importance of making healthy choices. Other parents described that the program had no impact on their child's nutrition habits, because they felt their child already had a healthy diet.

Impact on family's nutrition. The participating parent's involvement in this study was perceived to impact family dietary intake behaviours. They described that family meals now included healthier options (such as salads), and that unhealthy snacks were being switched out for foods with low sugar and carbohydrate content. In addition, parents taught family members about portion sizes, and children's lunches were prepared at the beginning of the week, and thus were better balanced than before the program. It was also expressed that because families had many, varying food preferences, change was hard to implement. Parents described that their partners were content with current food practices, or that their children had specific food preferences. In those cases, instead of preparing a separate meal for themselves, parents tried to include healthier alternatives to their families' meals.

Impact on child's PA. Parents described that their own involvement in the education program had an impact on their children's PA levels because parents encouraged their children to become more active, which in turn caused their sedentary and screen time to decrease. It was explained that children no longer came home from school and sat on the couch, but instead went outside to play. Some parents enrolled their children in more activities or participated in PA with their child. Children enjoyed using the pedometers for this study, as they liked observing increases in their step counts, and also engaged in competitions with their parent who

participated in the study. That said, some parents felt their children already engaged in high levels of PA, and as such there were no impacts on their children's PA.

Impact on family's PA. Parents perceived that their involvement in this program resulted in their family also experiencing health behaviour improvements. As noted at mid-intervention, families increased their PA levels and PA became more frequently done together compared to before the program. Parents explained that they engaged in more activities together such as walks, swimming, snowshoeing, and going to parks. In general, the family became more active as the parent increased their own PA and encouraged their family's participation. However, some families did not experience any impact on their PA levels from the program. Parents felt that they and their family were already active, and thus nothing changed, or that they and their family discussed and reviewed information from the education sessions, but no changes had been implemented before the end of the current study.

Impact on own nutrition. Parents spoke about changes they made in their own diets, and how they made substitutions for different foods, or cut other foods out completely. They described that they and their families no longer consumed convenience foods, they packed healthy lunches, and they substituted healthier alternatives (e.g., apple with cinnamon) to snack foods (e.g., sweets or chips). Some parents explained that they used leftovers for other meals (e.g., lunches) more frequently, and others implemented stricter portion sizes for themselves. Conversely, other parents did not experience any program impacts on their diets, though some believed they became more aware of the food choices they made.

Impact on own PA. Many parents described that they felt their PA increased throughout the duration of this study. Some, in particular, made more conscious efforts to incorporate PA into their days. They described parking further away from their destinations, taking walking breaks at

work, and using the stairs instead of elevators. Some parents explained that in trying to increase their child's PA, their own PA increased as well. A few parents felt that their PA remained consistent over the course of the program and though they had intentions of increasing their activity levels, no changes had been made yet.

Modeling behaviours. Parents in the control group indicated that throughout the program, as they changed their behaviours and their home environment, their families' behaviours changed as well. The parents who participated in the study noted that changes occurred in their partners and in their children because they themselves were making and modeling changes as a result of their involvement in this study. Some partners made changes in support of the parent who participated while others seemed to be motivated by the changes their partner was making. It was described that because the parent who participated chose to make changes in terms of food purchases, snacks, family meals, and PA, the rest of the family followed. Children, it was reported, noticed changes in their parents' behaviours, and also started to make more mindful, healthy food choices as a result of seeing their parents do the same. Parents explained that they were not aware of the extent to which children noticed and engaged in the same behaviours as their parent.

Accountability. Parents in the control group described that participating in this program increased their accountability for their own and their families' habits. They explained that by logging their dietary intake, they were able to review the foods they ate and felt an increase in accountability to make better choices. In addition, the in-person follow-ups were a source of accountability in that parents felt they should make healthy choices because they perceived the research team would be checking in on them at various time points.

Motivation. Participants described varying experiences regarding motivation. Some parents noted that their participation in the program motivated them to make changes in their health behaviours. They explained that the information from the program was the catalyst they needed to change their habits. Healthy behaviours became a priority for some in that they were more motivated to increase their PA or make better health decisions overall, compared to before the program. Conversely, other parents reported ambivalence toward behaviour change. They were aware of changes they felt they needed to make, and had ideas of how to do so; however, they did not yet feel motivated to implement them. Others explained that though they started to make changes, when they faced set-backs they were unmotivated to start over or continue.

Impact of program. Unique to this follow-up time, parents shared that they had a positive experience overall, in that they liked that the program incorporated their children, appreciated that follow-ups were conducted in their homes, and felt it provided them with the push or reminder they needed to make changes in their lives.

Table 10

Corroborative Quotations for Post-Intervention Themes and Sub-Themes (Control Group)

Increased Awareness
"[My child and I] talked about healthy [eating], like she always knew what a healthy versus unhealthy food was, but like when [she's] five and there's a bag of chips and apple I mean obviously she is going to choose that. So I find now that she is more likely to go and choose one of her healthy snacks without me having to remind her."
Impact on Child's Nutrition
• *Improved*
"We are hard on fast food now. …instead of just eating fries or cheese pizza [at the mall] she would go and get white rice, broccoli, or like shrimp. …[E]ven though some of that stuff's not…made the best, at least I know … that stuff is going to fill her up [better] than the other stuff."
"Even getting [my child] things like a protein bar right, because at least that's better than eating a chocolate bar. … So, we would buy something that was a little… healthier on the go, because he's usually running out the door in the mornings. … And, [I am] buying the … cut fruits and vegetables so that it is already ready for him to grab…."

"[My child has] always been a pretty good fruit eater. But we tried to introduce new foods, expand the repertoire… some vegetables, some protein. … [He is] eating carrots now, celery… we tried some beans, black beans and kidney beans. … Scrambled eggs."

- *No Impact*

"I don't think [nutrition] necessarily changed for [my child]. It wasn't necessarily the dietary stuff, for her. … There's never been a lack of healthy options in the home."

Impact on Child's PA

- *Increased*

"[Before the program my children would] come home… get a freezie or … a pack of gummies, and they would just sit. … Most of the time my oldest would always fall asleep then she would complain of headaches, so this summer… she wasn't the one steady participating [in this program] per se but she picked up off of the younger one [who was participating]. [T]he younger one … now …[has] a routine, it's normal for her. So now if she's watching TV too long, she gets fidgety. … It's almost like her body's telling her like you need to get up and do something … She's like 'okay, I'm going to go play' … [the older child is] getting better, too."

"We definitely are more active now. … Like [my child] snowboards now, he plays hockey, so I volunteer on their hockey team. …. Before [the program] I'd put him in maybe one sport, but now I'm … trying to get him to do more. … So I'll be taking him more often because it's really important… it's fun and we can be active and spend time together."

- *Enjoyed using pedometer*

"I do think [my child] tried to get more steps in with that pedometer. She'd be sitting still and then stand up and walk around and then look at the pedometer and stand up and look at the [step count]. And I would remind her, 'It's supposed to be honest, so when you're walking… you don't need to do extra steps.' But, I suppose it is nice that she did get excited by it, and I couldn't squash that, it was great."

"[My child] was very conscious of [step counting], and of course he liked [it] because he got more steps the days he played soccer… he was into it."

- *No impact*

"I don't think [my child's PA was] really impacted that much. I think… out of the two of us, [my child is] far healthier than I am. Probably because I realize how unhealthy I can be, and want to make sure I'm not instilling those bad habits into her. So I think for her, it was … repetitive information. … She listened to what I had to say, she watched a few videos with me, whenever it was directed towards the child portion, and then just went on her way. I don't think it really made a significant difference… she's always active."

Impact on Own Nutrition

- *Improved*

"[Now] I [have] been like 'nope, I don't need to get those chips.'"

"When I have one carrot, or two, you know, just leftover vegetables… I just puree them…freeze it, and then I use it in my pasta sauce."

"[I]ts not that I don't like vegetables, it's that… I find them like boring, and so … I try to make [healthy food] fun for me, too. But… [also trying to stay] away from … bad fats and everything like that."

"[The program helped with me] knowing if I do want a snack, I don't need the whole bag… [of] chips …. [N]ow, I put some in … a little kid bowl. … [I]f I eat a bag of chips with 1100 calories,

that's more than half of what I should be eating in a day… and I'm still hungry,' so that was like a big 'what did you just put in your body' [realization]."

- *No Impact*

"I wouldn't say that my eating habits improved all that much but definitely I'm more aware of it."

Impact on Own PA

- *Increased*

"I play baseball during the summer, …I signed up for yoga, which I've always been intimidated by. … [I also have been] going to [the gym at work] after work, and now… I park further away so I walk 15 minutes to work, and 15 minutes from work."
"I started a new job in the Fall. … And I've got my office on the sixth floor and I have stuff to do on the ninth floor and first floor and second floor; so I'm taking the stairs as much as I can."
"Because my son is more active, I'm more active, I don't just sit around all day. I'm …going out and doing sports with him …before I would probably never. I mean I would have but like it's a drag. … I still find it exhausting, but I much rather go out and do things with him if it makes him happy."

- *No impact*

"When I did the first surveys and read the modules, I had a plan, well not exactly a plan, a thought that I would increase my walking, kind of throughout my work day, like take regular walk breaks. … But it just, it hasn't happened."
"I can't seem to find time in the days … the days are just so busy, it's hard to kind of find a time. I mentioned it to a colleague also, who said she would be interested in going walking… but we have never found a time that we're both free to do that…which is depressing."

Impact on Family's PA

- *Increased*

"I think [we have] increased physical activity… heading down to the park after school or going for a walk, [because] … it's really easy sometimes when you've had a really long day…to say 'No we're just going to stay in.' But if [my child is] asking to go on a walk, nine out of ten times we're going to say yes. … We'll take her to the park, or go for a rollerblade, or whatever it is she wants to do. … So just being more active as a family… more frequently."
"Before [the program] we [would] go for walks but it was like just around the corner and then come back with the dogs and that's it. But right now, we spend more time together, because we don't go anymore to the corner, we… go for example to [the park] and we walk the whole [trail]. … We walk, and walk, and walk, and we play together, and we run, we go to parks so, it's keeping up [PA] together, and my family is helping a lot."

- *No impact*

"To be fairly honest, I don't think [the program has] impacted us at all. Probably because I went through it… at the beginning. We were all reading through it, and paying attention to it, and being cognizant of it, and then we just kind of got busy and fell off the track, right? So, [my child]… was excited to watch the videos with me, and we discussed it, and once that piece was over, it was kind of just over. There was nothing, there was nothing more to kind of, pull through."

"I would say [the program had no impact on my family's PA]… my two sons are very active, my daughter doesn't really do extra-curriculars yet because she's small, but she's kind of active throughout her day."

Impact on Family's Nutrition

- *Improved*

"We've been eating less canned food, too. … [Because] there's a lot of salt in there."
"Before going back to school, I would hit Costco and just buy boxes of things … and there's … a drawer [in our home] so they put their hand in and grab whatever they want for a snack… but it's all packages. … gummies, granola bars … Jello …juice boxes. And now they they get water bottles, so they have nice water bottles… One's got a Caesar wrap in her lunch for tomorrow and the other one has a cheese quesadilla on …whole wheat naan … instead of … before it'd be morning of, I'd just be grabbing handfuls and throwing it in lunch… grabbing a packet of 'garbage.'"

- *No impact*

"Once I was through all the videos and stuff I kind of fell off [the program]. So, overall the impact was more just me, and being cognizant of my, I guess bad behaviours, is essentially what it is, my bad eating behaviours. But overall, as a family, it hasn't changed."
"My husband [went to Costco]… and he said, 'well, I'll just buy some food for us,' [because] I was out, and so they brought a whole… prepared lasagne. [Because] it was only 13 dollars, and it was really good, you know? … So, I'm asking, you know, 'Where's the box, [what was the nutritional content] in it?' … They don't care. … [If they could, they would eat] that lasagne thing everyday, and the apple pie."

Modeling Behaviours

"My husband… is now down 43 pounds. … He doesn't drink sugar anymore… the fridge mostly [has] water… he's coaching… football… and out he's out in the heat right now, where[as] before he would come home, get on his laptop, watch TV, and then have his phone. … So, now three nights a week he's out coaching football. … It blows my mind because he doesn't feel sluggish anymore. … sugar… was … the biggest thing for our family. [O]nce we went through that massive first two weeks of … shock to your system, where everyone felt horrible… then we started feeling better… ."
"[My child] joined track this year, she's joined the volleyball team so I think [me changing my habits] helped to motivate even her to be… more active as well. …. [S]he sees me being more active instead of… coming home and just slumping on the couch, which isn't good. …. I was coming home so exhausted… so she just noticed… that I'm not looking and feeling so exhausted."
"Obviously I don't wanna see my husband eating a hamburger, and I would be eating vegetables. … So, I wouldn't like that. … My husband doesn't like vegetables, but he's eating them… because he wants to help me and help my son too, because obviously my son would say 'okay why [is] daddy not eating that and why I am eating this?' … So, all of them are changing."

Increased Accountability

"I think I'm already aware, but it's certainly, when you write it down… recall [food choices], it's [like] 'ding! Reminder [and keeps you accountable for your choices]."

"Knowing that I have been participating in the study and that someone is going to be checking and I'm going to have to talk about it and just, you know, kind of that accountability piece."

Motivation

- *Increased*

"[The program] motivated me, to start … being more active. I want [my children] to be as healthy as possible, and obviously for me, it helped me a lot. I was so lazy! … now… I started a boot camp."
"I don't think I learned anything that I didn't know …but it was the kick start that I needed, because I was just coming off of medication and just coming off of having a baby after a year so I knew I needed to implement changes, I just kind of wasn't ready to get it started but it kind of gave me a reason to get it started.

- *Motivation challenges*

"The hard part, too, is when we started, I did lose a little bit, and I was so excited, and then life happens, … and then you fall back, or you gain that extra pound, and… I just felt like I immediately gave up. … Even though I knew that I needed to keep going, it was just like, 'Ugh, what difference is it gonna make?' And then you get into… the self-doubt, and the negative self-talk, and all that kind of stuff."

Impact of Program

- *Positive program experience*

[The program was] very accommodating, [and] you being friendly [was important] because it can be really intimidating for people, especially [on] any kind of health journey, it can be super intimidating… … . but you've been accommodating, you've been great so… it really helped. Like it really... it's easy. … It was amazing, good program. … Life changing."
"It was an overall positive experience for us and it was good to put us back on a health track and just be you know a reminder [of] what we need to be doing. … I think it was good to remember that if you put in that little bit of extra work it's worth it in the end."

Six-Month Follow-Up Themes

Intervention group themes. Seven themes and 11 sub-themes were identified from 6-month post-intervention interviews with intervention group parents (n = 9). Two themes and eight sub-themes were unique to this follow-up time, and therefore are discussed in detail. Corroborative quotations for each new theme/sub-theme can be found in Table 11.

Overall impact of coaching. During their six-month follow-up interviews, parents in the intervention group again stated that coaching was a positive experience for them. They explained that through coaching, they realized the interconnected nature of physical and mental health

allowed them to better understand the process of their own behaviour change. In addition, parents also recounted that coaching made them feel accountable and motivated to change their behaviours, and even after coaching concluded, they continued making changes. They explained that this differed from their previous behaviour change attempts in that, with added stress, they normally would have let their own health falter. Parents restated that coaching allowed them to work through root causes of their behaviours, which in turn improved their mindset, and helped them alter the way they viewed behaviour change. Parents shared that coaching had lasting impacts in that they continued to use strategies provided by their coaches such as journaling, identifying roadblocks, and prioritizing themselves.

Impact on own and family's nutrition. Unique to this follow-up time, parents explained that implementing meal preparation into their routines facilitated healthy eating in their homes and made the healthy choice the easier one. When parents and their families were aware of what was available in their homes, and what they were preparing for each meal, they were less likely to seek out convenience foods.

Barriers to behaviour change. Parents in the intervention group shared that they faced barriers to behaviour change during the 6-months following program completion, these included: (a) stress; (b) motivation; and (c) time. Without the support of their coaches, some parents reported the changes they implemented had reverted back to their old habits. Some noticed that with increased stressors, they returned to using unhealthy or convenience foods for comfort. Others explained that their ambivalence toward behaviour change had reoccurred; however, they were more aware of their excuses that hindered them from making changes. Due to their children's busy schedules, parents felt they lacked time to engage in their own PA. In addition, parents faced other barriers to improving their and their children's PA and nutrition habits, such

as poor weather and increasing prices for healthy foods. With their children transitioning to full school days, some parents reported that their children were more sedentary at school than they were at home. Parents also noticed that their friends and other family members (e.g., their own parents) made committing to behaviour changes difficult because the need to change diets or cut out certain foods was not understood by others.

Table 11

Corroborative Quotations for 6-Month Follow-Up Themes and Sub-Themes (Intervention Group)

Overall Impact of Coaching

- *Positive*

"It was an interesting experience having a life coach, as it made you realize how much all the aspects of your life are correlated. So that made a big difference."

"I loved the start of [the program] I don't think I would've done as well if I hadn't had someone to talk to. Personally I probably would have loved [coaching] to go on a lot longer. But I think that's why people who join programs are successful, it's because they have someone they are accountable to for a longer period of time. … I felt like I could talk to somebody about what my struggles were, who was going to not just listen but help me overcome some of them."

- *Improved mindset*

"I think [coaching] was probably the best part [of the program]. I think just working on that mental stuff really helps translate into everyday life. … Like, after the sessions, you feel better. And so then you're more inclined to … eat something healthy and go for a walk as opposed to come home and sit and eat chips on the couch, you know? … More motivated."

"[My coach] had me actually walk away from a fitness company that wasn't serving me… the relationships I had built with this fitness company were harming my mental health more than helping my physical health. So, she had me walk away from that, which, for mental health was really good … [I began] at-home workouts …which, with my busy schedule, worked really well for being able to fit that in at home."

"My friends can see the struggle of 'I don't want to eat that' or 'I want to lose weight,' but [my coach] was able to take me to a deeper level of why I was so enamoured with food … and you know … the other things I needed to deal with and heal to stop replacing them with food. … So, [coaching] was probably the best part of that entire thing."

- *Change in perspective*

"[My coach and I] talked a lot about happiness and what does that weight really mean and the end of it… [I realized] 'you know what, I'm just as happy whether I'm 5 pounds up or whether I'm 10 pounds down.' … I don't stress [about weight] nearly as much as about it as I did before."

"It's hard to keep [behaviour change] going and that was something that my life coach sort of helped drill into me, that just because you're not doing it exactly the way you want to do it now doesn't mean you should stop, right? So, I think that's something that I keep in my head, you

know, just because you haven't gone to the gym in 2 weeks doesn't mean that now you can never go again. … you can start again."
"[My coach] allowed me to see that I can get healthier, but still love who I am. It doesn't mean I don't love myself or the size I'm at, or the person I am, currently."

- *Long-term strategies for behaviour change*

"I still will sometimes force myself to go back and look at things the way [my coach] would have made me look at it. … I've gone back and read my notes about things that we've talked about… she has changed my thinking on so many important things [which] has really helped …going forward. And then that does change things like the physical aspect and the nutrition, because I'm looking at it from a different lens."
"The main thing that the life coach kind of instilled on me [was] that you have to kind of put yourself first because if you don't then everyone else kind of suffers too, so it's the biggest thing that I took away from it."
"[My coach] encouraged me to do some journaling… and I've continued to do that. And then she just gave me some just tips on how to, how to get that motivation going again so when it starts to get to a low period, what to do to kind of kick start that."

Impact on Own and Family's Nutrition

- *Meal preparation*

"[Meal preparation] saved me a lot of time and energy just making things simpler, knowing my family's eating better. I'm not running to the grocery store every other day trying to grab stuff to eat. So, [the program] just improved our life in a lot of ways."
"We go grocery shopping on Saturday and buy everything we need for the week, so there's no stress that way. … And it is something that I'll just continue, because it works well for our family. … We know exactly what's there, and some of the things I will prep on the weekends, and so it's easier to then cook on the weekday."
"We were a big granola bar family or cookies or chips, the things that are really super high in carbohydrates, and quick to grab. But if we do meal prep, then we're a lot faster to grab like a salad or some vegetables that are already cut, or fruit."

Barriers

- *Stress*

"Probably more than 6 months ago I was going to the gym more often, and making a better effort with my diet, and making sure my daughter was getting more activity as well. And now it just, because of time constraints, and probably a bit of stress, and probably a bit of anxiety, it's sort of slid back a bit. … Eating has been a challenge and we've definitely been relying a little more on restaurants than we want to."
"I still notice when I'm stressed, I do eat a lot and then it doesn't help and then when I get sick … I use that as an excuse to like not do anything. … It's … that habit-forming thing, you have to do it for um at least 21 days before it sticks. And so, I have to just get back in to that and stick with it."

- *Motivation*

"As I'm watching the leaves start to change I can feel … excuses starting, like, 'Oh, well I could put something in my lunch time so I don't have to go for that walk.' …[T]hose excuses … won't better myself, but it's a pattern I've always done and it's very normal for myself. But I'm trying to go against those and work against what my natural inclination to continue those walks."

- *Time*

"One of the biggest challenges is now [my children] have something every single evening, and we are literally flying from where I pick them up at their after-school program, home, eat dinner, and then out to something for them. They continue to stay active. … But that forces me to go and be sedentary most of the time, at their things, watching them be part of those fun activities."

Control group themes. Eight themes and 18 sub-themes were identified from 6-month follow-up interviews with control group participants (n = 10). Two themes and six sub-themes were unique to this follow-up time, and are therefore discussed in detail. Corroborative quotations for each new theme/sub-theme can be found in Table 12.

Prevention. A prominent theme at 6-month follow-up was that parents in the control group further realized steps they needed to take to prevent their children from inheriting less healthy habits and prevent the development of adverse health effects associated with overweight/obesity in themselves; Unlike other follow-up times, at 6-month follow-up, many parents in the control group explained that they realized the long-term impact overweight/obesity could have on their lives (i.e., diabetes, physical limitations, joint pain), which motivated them to make changes to their PA levels and dietary intakes. They stated that they did not want physical limitations to prevent them from engaging in activities with their families, and that it would be vital to implement changes at this point in their lives (i.e., before the onset of ailments). Lastly, participation in this program encouraged parents to explain the importance of healthy choices to their children to ensure that healthy food habits would persist into their later life stages.

Change in perspective. In making improvements to their PA and dietary intake, parents noticed changes in their perspectives. They explained that they put less emphasis on weight loss, and more on developing lasting lifestyle changes toward healthy behaviours overall. This investment in their own health behaviours resulted in some parents prioritizing themselves by ensuring that they set time aside for their own PA and self-care activities. Changes in mindset

facilitated behaviour changes in parents because when they felt better about themselves, they were more likely to engage in PA or eat well, further motivating them to continue improving their health behaviours overall.

Barriers to behaviour change. At 6-month follow-up, parents in the control group reported barriers that prevented them from continuing behaviour change after their post-intervention follow-ups. Unique to this follow-up time, and similar to the intervention group, some parents in the control group also experienced the return of their ambivalence. They described that they knew they should be engaging in PA and consuming healthy foods, but their motivation to do so had tapered. Given that seasons had changed over the duration of program follow-ups, many participants described that they felt less inclined to engage in activities when it was raining or snowing. Lastly, some parents spoke about other barriers including social situations (i.e., frequent socializing was associated with eating at restaurants), and the accessibility of junk foods when grocery shopping.

Table 12

Corroborative Quotations for 6-Month Follow-Up Themes and Sub-Themes (Control Group)

Prevention

- *Habits in child*

"[I am] trying to develop health habits long-term so that when [my child is] a teenager, [and] he has more access to food, that he makes good choices."

"I think [I am] realizing that my decisions, and [the] behaviour [I] model for [my child] could… become a struggle, and I don't want that for her. … Now [I'm] realizing that my decisions aren't only decisions for me. And I think that's been probably the biggest part [that helped with behaviour change], is realizing I don't want her to ever [struggle with health]."

- *Developing adverse health effects*

"Some of the questions [in the questionnaires] about your like physical things like 'has this stopped you from doing this?' I never thought at my age [that I would] answer yes to those things but like I was literally [having] a hard time getting off the floor."

"I am getting older and my health may deteriorate outside of my control, so the things I can control I feel like I should control like keep my weight down, keep my heart active."

Changed Perspective

- *Toward behaviour change*

"I don't have any resounding health issues. So, I feel like that's almost been an excuse. 'Well, it's not that bad. I don't have high cholesterol, I don't have diabetes, I don't have thyroid issues.' And I think I needed to get past that mind frame of thinking it's not that bad, and being like, 'You know what? I'm not happy with what I see in the mirror, and I need to change that. And the only person that can change that is me.'"

"I do have to give myself a little bit of credit. I am doing a much better job [of being healthier] than I have previously. … This year my goal [was] living a healthier lifestyle. So I didn't choose the, 'I'm gonna join a gym and lose weight,' I chose the overall healthier lifestyle."

- *Prioritized themselves*

"I try to make sure I carve out 'me time' in the day [now], so if they choose to join, that's awesome."

"Cardio helps me a lot, because I make that my time. … I'll listen to a podcast, or I'll watch YouTube. … Zone everyone else out. … [Which helps with my mental health]… It helps me sleep better, too, which is great."

- *Improved mindset*

"I think that it [was] maybe not necessarily the nutritional information and stuff I was watching, but kind of the subliminal messages of, 'You don't need to be afraid of [changing behaviours].' And, people aren't viewing you and judging you the way you are judging yourself. So I think that has kind of been my biggest takeaway from the whole process."

"Exercise makes me relax. … Before I [was] always fighting with everybody and I was so stressed. … And now, I started going to the gym and whenever I'm stressed I just go and run … and I come [home] like new. So I think that's what helps me [continue with behaviour change]."

Barriers

- *Motivation*

"Before I had like more time to focus on [health behaviours], and that was my focus and like being somebody that has grown up with weight issues it always has to be a focus. … Like I'm not going to wake up one day and… be like I really feel like a kale salad right now. … So it has to really be a conscious decision for me… to eat in a healthy mindful way. … And I just haven't been in that mind set right now."

"[It has been] just like super busy time at [work] right now. Like I didn't even stop today for lunch. … It [has] just been crazy. … [But] hard it's that like cognitive dissonance like I know I should be [eating better and being physically active] and then I'm not doing it, and then I feel guilty because I know I should be doing it, and I'm not doing it."

Discussion

Quantitative data varied at each time point (i.e., baseline, mid-, post-, and 6 months post-intervention) and between groups. Decrease in sodium intake from baseline to 6-month follow-up showed a trend toward significance ($p = 0.04$) in parents in the intervention group. While the data were not statistically significant, trends in data are important to note for future research and are addressed below.

Similar qualitative themes were identified between intervention and control groups at all follow-up time points (i.e., mid-, post-, and 6-months post-intervention), with the intervention group reporting more salient experiences with: goal setting; accountability; addressing root causes of behaviours; changing perspectives; and improving mindset. Coaching provided the intervention group with new, lifestyle skills and perspectives not reported by the control group, though it seemed both groups experienced similar barriers at the 6-month follow-up. Also of interest is that the control group perceived no impact of the program on their, their child's, and their family's behaviours more frequently than the intervention group. However, at 6-month follow-up the control group expressed wanting to change their behaviours in order to prevent the same behaviours in their children and the consequent development of adverse health conditions, while the intervention group did not.

Compared to baseline, children in the intervention group increased their step counts at all time points. Interestingly, children in the control group recorded high step count at baseline, and their step count remained around this level for the duration of the program. Given that most parents in both groups described their children as highly active before the program began, major increases in their children's step counts may not have occurred as a result of the program. In their interviews, parents noted that they began to take more notice of their children's PA behaviours, thereby prompting them to encourage increased PA in their children. In addition, many parents in both groups described that their children thoroughly enjoyed using the pedometers to track their step counts, which in turn motivated them to accumulate more steps. This may have resulted in step counts that were higher than normal for some children in this study. Parents explained that their families started to engage in more PA together, and some noted that their children

developed a habit of being physically active after school as opposed to their pre-program sedentary behaviour.

According to CSEP (2019c), adults who achieve greater than or equal to 7,500 steps per day are classified as having a 'physically active lifestyle,' and those who attain 5,000 to 7,499 steps per day fall in the 'low active lifestyle' category. Currently in Canada, 52% of adults are considered to have a 'physically active lifestyle,' while 29% engage in a 'low active lifestyle.' Based on these guidelines, adults in both intervention and control groups were classified in the 'low active lifestyle' from their baseline step count. Following the program both groups improved to the 'physically active lifestyle' category at post-intervention. At 6-month follow-up, the control group continued to increase step counts. Parents in the intervention group recorded fewer steps at 6-month follow-up than their respective baseline mean. Interestingly, both groups had increased their active MET minutes at mid-intervention, when compared to baseline. It could be deducted, when comparing quantitative and qualitative findings, that immediately after joining the program parents felt motivated to increased their PA. Parents in the control group decreased their sitting time per day at all time points. At 6-month follow-up, parents in the intervention group had higher sitting time than they did at baseline. Many parents described their jobs as involving high amounts of sedentary time, in that they worked at desks and found it difficult to take breaks during the day; however, parents also reported that their involvement in the current study encouraged them to take more deliberate stretching and walking breaks during their days.

Children's dietary intake did not change significantly during or following the program; small fluctuations in intake of proteins, fibre, saturated fat, and sodium were reported. It is of interest to note that changes in children's diet did not reflect those of their parents'. While there were no

major changes in children's dietary intake, parents reported that they perceived their children's awareness of healthy foods increased through their involvement in this study. Parents reported that children became more cognizant of their dietary intake choices and what foods were considered 'healthy' versus 'unhealthy.' Through their parents' involvement in this study, children learned how to interpret nutrition tables, and made more informed nutrition choices. In a comparable study, following a highly participatory, community-based PA and nutrition intervention for children (ages 6-10) and their families, children had decreased their energy, fat, saturated fat, carbohydrate, and sodium intakes (Xu et al., 2017). This would suggest that including more interactive child-based components in the current study may have resulted in more significant changes in children's nutrition.

At baseline, parents in both groups consumed well over the recommended amount of sodium (2300mg per day; Health Canada, 2017b) for Canadians. In order to avoid health risks (e.g., hypertension), it is recommended that individuals should not exceed consuming the recommended amount of sodium per day, yet approximately 80% of Canadians intake 3400mg of sodium per day (Health Canada, 2017b; 2018). Parents in the intervention group substantially decreased their sodium consumption to below 2300mg, as is evident in the interaction plot. Although this decrease was not statistically significant ($p = 0.04$), it is important to note that action toward decreasing unhealthy behaviours was being implemented. This decrease in sodium consumption could be attributed to parents having a better understanding about the information on nutrition labels, and/or, limiting processed or convenience foods in their homes. Some parents reported that by reducing their snack or convenience food intake, their cravings for such foods also dissipated. Limiting these foods might have subsequently decreased their sodium consumption. Sodium intake of children in the intervention group did not reflect the same pattern

as their parents' intake. At baseline, children in the intervention group were consuming slightly less than the recommended amount of sodium, whereas at baseline they were consuming more than the recommended amount.

At 6-month follow-up the intervention group had a slightly lower BMI and waist circumference compared to baseline. Parents in the control group did not experience many changes in BMI. In addition to a small sample size, it is possible that the 6-month follow-up period was not a long enough duration to observe statistically significant changes in body composition. A longitudinal study would allow for assessment of long-term changes in participants. In addition, a longer follow-up period (> 6 months) might allow for more significant changes in PA and nutrition behaviours, which, in turn, might result in decreased BMI. It has been noted that in the absence of a weight maintenance program, weight loss tends to reverse with 50% of participants returning to their original weight after five years (Montesi et al., 2016). Researchers have noted that employing extended care models in obesity treatment studies (e.g., text message reminders, in-person group sessions) have resulted in increased weight loss maintenance, and long-term PA and dietary behaviour change (Montesi et al., 2016). This is because extended care models provide patients with the support and motivation needed to continue implementing behaviour changes (Montesi et al., 2016). Many participants in the current study expressed feelings of ambivalence at 6-month follow-up, suggesting that a form of extended care might have assisted in continuing behaviour changes they implemented during the program (Montesi et al., 2016).

Parents in the intervention group explained that changing their health behaviours (e.g., increased PA, and healthy food choices) resulted in them developing positive mental health, thereby motivating them to maintain those changes. Those in the intervention group expressed

the desire for a program that would have allowed them to work through their psychological challenges to change (e.g., sources of ambivalence toward behaviour change). Researchers have noted that emphasizing weight-related measures in obesity studies may unintentionally draw parents', and consequently children's, attention to weight; thus, foci should be shifted towards the more positive notion of healthy lifestyles (Montesi et al., 2016). Parents in both groups explained that through the use of pedometers and food tracking, they increased their awareness of their habits, and the webinars provided them with information to help modify their behaviours. They expressed that learning about various aspects of nutrition (e.g., reading nutrition labels) and PA (e.g., recommended daily levels for each age group) motivated them to make changes not only in their own lives, but also in their families'. Ostbye and colleagues (2012) reported that mothers of preschoolers (2-5 years old) who received health information via mail and 20-30 minute telephone coaching sessions incorporating motivational interviewing, over the course of eight months, reduced sugar-sweetened beverages, increased fruit and vegetable consumption, and changed their home environment (e.g., fewer meals eaten in front of television) for them and their children. These findings are consistent with findings from both control and intervention groups in the current study. It has also been found that attempts to improve healthy lifestyles in the home can be more effective if parents are able to adopt and model these behaviours themselves (Ostbye et al., 2012). Again, parents in both groups of the current study reported that modeling healthy behaviours resulted in their children wanting to do the same.

It could be speculated that because parents in the intervention group were no longer working with their coaches, they experienced a slight decline in behaviour changes they had implemented during the program. In their interviews, parents in the intervention group reported that coaching allowed them to work through root causes of their behaviours and frequent roadblocks they faced

when attempting to implement changes. In addition, parents also reported wanting more coaching sessions to work through more of their behaviours. Given that Co-Active coaching centers on encouraging the client to set the agenda for sessions, parents in the intervention group spent some of their sessions working through these issues. Thus, it is possible that with more coaching sessions they may have made more significant, targeted behaviour changes.

It has been reported that increases in autonomous motivation (AM) – the most self-determined form of motivation – predicts improvements in food choices and long-term adherence to PA in both men and women (Center for Self-Determination Theory, 2019; Webber, Tate, Ward, & Bowling, 2010). Conversely, controlled motivation measures the extent to which a person feels external pressures to change, and is associated with low adherence to behaviour change (Levesque et al., 2006). In a study of a national sample of parent-adolescent dyads (of any weight), it was found that increased AM was positively correlated with fruit and vegetable intake in that high levels of AM were associated with greater fruit and vegetable intake (Dwyer et al., 2017). In the current study, AM did not vary greatly within or between groups with regard to diet or exercise; both groups reported high AM throughout the program. It could be argued that, given that motivation was high at all time points, this group of parents were already highly motivated to make changes in their behaviours (which may have been exemplified by their decision to join the study); therefore, any changes in motivation would have been minimal (Dwyer et al., 2017). Similarly, in the current study, parents reported feeling more motivated to make behaviour changes when they perceived feeling better about themselves. In their interviews, parents from both groups described developing increases in motivation to engage in PA and consume healthier foods; however, parents in the control group reported higher levels of AM at 6-month follow-up when compared to baseline. This finding is surprising in that at 6-

month follow-up parents from both groups explained that they began to experience more ambivalence toward behaviour change in the face of barriers upon program completion. Motivation has been reported as being high in the initial stages of a lifestyle intervention, whereas maintaining motivation is challenging (Webber et al., 2010). Burgess, Hassmen, and Pumpa (2017) explored barriers to behaviour change for adults with overweight/obesity, which included: lack of time; environmental, societal, and social pressures; health and physical limitations; and difficulty managing negative thoughts or moods (Burgess et al., 2017). Parents in the current study explained a few similar barriers (e.g., lack of time) that prevented or discouraged them from maintaining their behaviour changes. It can be inferred from these findings that some parents require assistance with maintaining their motivation to make healthy choices upon completion of behaviour change programs.

Strengths

Various techniques were employed to ensure study quality and credibility of data. First, inclusion of a qualitative component, through a mixed-methods study design, enhanced external validity of the RCT (Shannon-Baker, 2016). Parent interviews allowed researchers to understand and contextualize changes in the outcomes that were not evident in quantitative findings. From the qualitative component, the researchers gained insights into the impact of the program on the participants that were not reflected in quantitative results. In addition, including negative cases (i.e., feedback that is not consistent with positive findings; Patton, 1992) provides researchers with critical information regarding aspects of a program that may not be best suited for a particular group, or illuminates areas for program improvement (e.g., having webinars available in audio format. Conducting interviews at multiple time points also allowed researchers to assess any changes in experiences over the course of, and following, the program. This study may have

been the first to incorporate a process-oriented approach (Sobo, Seid, & Gelherd, 2005) to explore experiential changes over time. Highlighting themes that were the same or different at the various timepoints reveals process-oriented changes, particularly when quantitative data did not provide robust results. Employing a rigorous qualitative component over time can be valuable in understanding how experiences changed over the duration of the program and follow-up periods. The repertoire of tools within CALC is plentiful, which could be considered a limitation of the approach, as each participant receives a different combination of tools based on the coach's selection. However, CPCCs have been trained in each of CALC's tools, as well as in recognizing when to use them in order to best tailor the approach to each participant. Therefore, the researchers maintain that the utilization of a standardized coaching method, CALC, was effective because it allowed for participants to receive similar models and techniques of coaching, reducing variability of experiences. The webinars greatly influenced the control group, more so than anticipated, resulting in both groups qualitatively reporting substantial changes in their environments and behaviours. Some parents in the control reported benefitting greatly from the webinars alone, and made important changes in their lives due to their program experiences (e.g., meal preparation; prioritizing themselves).

Limitations and Future Directions

Despite the research team's efforts to recruit both fathers and mothers, the majority (n = 47) of participants were mothers. Morgan and colleagues (2017) conducted a systematic review to measure participation rates of fathers in obesity treatment and prevention programs targeting children and adolescents (0-18 years); the researchers reported that of the RCTs that limited participation to one parent only (n = 80), fathers only represented 6% of parent participants (Morgan et al., 2017). Davison and colleagues (2018) examined the representation of fathers in

family interventions to prevent childhood obesity, and also found that only 6% of parents who participated in the eligible studies (n = 30) were fathers. Interestingly, in the current study only three of 50 parent participants were fathers, a fact consistent with the aforementioned 6% participation rate. Fathers impact children's weight-related behaviours during early childhood, such as diet, PA, and media use (Davison et al., 2018). Thus, it seems imperative to recruit actively and perhaps even target fathers in obesity treatment and prevention interventions. (Loth, MacLehose, Fulkerson, Crow, & Neumark-Sztainer, 2013; Wong et al., 2017).

Recruitment and retention of participants also served as a limitation in this study. Although approximately 300 different organizations were contacted to assist with recruitment efforts, the target sample size was not obtained until 15 months after recruitment began. In order to ensure the program was convenient for participants, the intervention was offered over the phone and online, and the research team conducted follow-up assessments at participants' homes. Despite this, retention of study participants also posed difficulty, in that participant dropout occurred at each follow-up point. Researchers have reported that participant recruitment and retention in childhood obesity interventions – particularly in community settings – pose challenges due to the time required for baseline measurements, intervention delivery, post-intervention follow-ups, and sustainability measures (Cui, Seburg, Sherwood, Faith, & Ward, 2015). It is possible that deterrents for participation in the current study included the intensive nature of the program (e.g., questionnaires, in-person assessments, several follow-up times, food and step tracking). A few parents in the intervention group did not complete their coaching sessions; as coaching is a highly personal experience, and immediately targets sensitive topics, it is possible that these participants did not enjoy the nature of the intervention. This can be inferred from parents who did complete coaching, who explained that coaching felt awkward at

the outset but improved over the duration of their sessions. Given that participants were randomized to treatment, it is possible that the fit with their coach was not natural for them. In the future, offering a self-selection option may be valuable in order to determine whether this impacts adherence to treatment.

The lack of statistically significant quantitative results may be due to attrition and heterogeneous group difference shifts, meaning that some individuals may have experienced stronger impacts from the program than others but the group itself did not. Given that coaching is an individual experience, it is not surprising that the intervention effected individuals differently. Attrition was high at the end of the follow-up times, thus preventing any statistically significant results due to lack of power. In addition, while the researchers hoped to explore the impact of the program on dietary intake by analyzing nutrients, changes were very subtle and varied between individuals and groups. In order to observe changes at the nutrient level, a larger sample size is needed. In general, the small sample size did not allow for an in-depth assessment of some outcomes. In addition, self-report bias and recall error may have resulted in less accurate data compared to direct measures (Hattori & Sturm, 2013). Social desirability bias (i.e., answering questions in a manner that will be viewed positively by the researchers; Fisher, 1993) may also explain differences in qualitative and quantitative data, in that participants may have been overstating changes in their behaviours.

Conclusion

Although, from interview findings it seemed that both control and intervention groups experienced similar benefits from program involvement, the marked difference was goal setting and accountability skills, and improved mental health, in the intervention group. The intervention group was able to work on identifying and addressing root causes of their behaviours. While the

program enabled both groups to heighten their awareness and education of health behaviours, coaching allowed parents to select issues in their lives they wanted to work on, which, in turn, helped them improve their PA and dietary intake behaviours. Based on feedback from parents, coaching is an effective method to initiate behaviour change; however, it seems participants require a form of extended care to assist them with maintaining positive changes. The control group explained that they benefited from the webinars but wanted more external support for behaviour change. Based on qualitative findings, it seems CALC is an effective method for addressing and enhancing health-related behaviours not only in the participating parent, but in their family as a whole. Future research should explore the impact of more frequent and/or longer coaching sessions, as well as integrate more participatory methods for child-participants (e.g., inclusion in coaching sessions), and measures (e.g., interviews or surveys) to gain their perspectives on changes over time.

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Chapter IV: Clients' and Coaches' Perspectives of a Life Coaching Intervention for Parents with Overweight/Obesity[3]

Background

Overweight/obesity is a growing global health concern leading to epidemics of preventable chronic disease (Public Health Agency of Canada [PHAC], 2011). In Canada, 61.4% of adults and 33% of children have overweight or obesity, and each year health complications associated with obesity (e.g., hypertension, stroke, various types of cancers) are responsible for up to 66,000 deaths (Ogilvie & Eggleton, 2016). While overweight/obesity can lead to chronic disease, it is also associated with stigma, and reduced self-esteem and psychological well-being (PHAC, 2011). Of particular concern is that obesity developed during childhood is known to continue into adulthood (Ventura & Birch, 2008), suggesting the risk and burden of chronic disease may develop earlier and persist into later life stages. Overweight/obesity is potentially preventable by promoting behaviours most associated with healthy body weight – physical activity (PA) and healthy dietary intake (Health Canada, 2006, 2012; Statistics Canada [StatCan], 2018). According to StatCan (2019), too many Canadians in all age groups are insufficiently physically active, with 84% of adults (aged 18-79 years), 61% of youth (aged 5-17 years), and 38% of children (aged 3-4 years) not achieving the recommended activity levels for their age groups. Furthermore, Canadians consume calorie-rich and nutrient-poor foods in excess; the country has the second highest annual sales of ultra-processed foods (e.g., cereals, sweet or savoury snacks, and fast foods; Moubarac, Batal, Louzada, Steele, & Monteiro, 2017;

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Ogilvie & Eggleton, 2016). Unfortunately, these ultra-processed foods represent almost half of Canadians' daily calories (Health Canada, 2006; Moubarac et al., 2017; PHAC, 2011).

Parents have a strong influence on the PA, dietary intake, and overall weight status of their children. Not only is parental overweight/obesity weight status predictive of their children's weight status (Bahreynian et al., 2017), but their parenting and the home environment are also overlapping contributors influencing their children's likelihood for overweight/obesity (Faith et al., 2012; Golan & Crow, 2004; Haire-Joshu et al., 2008; Lioret et al., 2012). Not surprisingly, previous research underscores the importance of health promotion obesity-related initiatives that include a focus on the parent, rather than on the child only (Wolfenden et al., 2012; Faith et al., 2012; Jansen, Mulkens, & Jansen, 2011).

One evidence-based intervention approach associated with reductions in obesity-related outcomes among adults is Co-Active Life Coaching (CALC; Kimsey-House, Kimsey-House, Sandahl, & Whitworth, 2018). CALC is a theoretical, client-centered communication approach aimed at helping people identify and reach their goals (for a full explanation of CALC, see Kimsey-House et al., 2018). Researchers have reported positive outcomes from CALC interventions aimed at reducing adulthood obesity, such as reduced waist circumference (Newnham-Kanas, Irwin, Morrow, & Battram, 2011a; Pearson, Irwin, Morrow, Battram, & Melling, 2013a), body mass index (BMI; Goddard & Morrow, 2015; Pearson et al., 2013a), enhanced self-esteem (Goddard & Morrow, 2015; Newnham-Kanas et al., 2011a), and improved functional health status (Mantler, Irwin, & Morrow, 2010; Newnham-Kanas et al., 2011a).

Gathering both emic (insiders') and etic (outsiders') points of view is vital to the successful design and implementation of health promotion programs (Gittelsohn et al., 1999). Thus, studying coaches' views on coaching-related practices could provide a rich understanding

about working with parents with overweight/obesity. Equally important for understanding the coach-client experience is exploring the experiences of parents receiving the coaching intervention. Although the importance of understanding various stakeholders' (e.g., coaches, interventionists) ideas on how behaviour change should be implemented and sustained has been noted (Dahl, By Rise, Kulseng, & Steinsbekk, 2014), research investigating both interventionist and client perspectives in the area of obesity prevention and treatment is sparse. Most research regarding populations with overweight/obesity provides insights pertaining to participant experiences only (Dwyer, Needham, Simpson, & Heeney, 2008; Pearson et al., 2013a; Pearson, Irwin, Burke, & Shapiro, 2013b; Sherwood et al., 2015), with few studies incorporating coach perspectives (Newnham-Kanas, Morrow, & Irwin, 2011b). Newnham-Kanas and colleagues (2011b) interviewed the Certified Professional Co-Active Coach (CPCC) in their study to gain insights on their work with a population of women with overweight/obesity. The coach felt that having a deep sense of empathy and creating a safe space were the most important tools needed when working with this population due to the stigma they face, and the struggle they experience when addressing their health behaviours (Newnham-Kanas et al., 2011b). The researchers posited that exploring perspectives from CPCCs working with a particular population would allow for information sharing among coaches, thereby potentially increasing their effectiveness in working with clients to meet their goals (Newnham-Kanas et al., 2011b). Understanding both client *and* coach perspectives can contribute to an appreciation of how both parties experienced coaching with the goal of informing coaches on best practices when working with particular populations. Therefore, the purpose of the current research was to determine the coaching-related experiences of clients (i.e., parents) and coaches who participated in a 3-month obesity intervention.

Method

Study design and procedures. This descriptive study integrated one-on-one interviews with clients and coaches, as part of a larger randomized controlled trial, the full detail of which have been described in detail elsewhere (Karmali et al., 2019). A brief procedural description relative to the current study is described below. This research was approved by the host institution's Health Sciences' Research Ethics Board (ID #109219).

To participate, parents (n = 25) had to have overweight/obesity (BMI of 25 kg/m^2 or greater; measured by researcher), a child between the ages of 2.5-10 years old, access to a computer to complete study-related activities, and speak English. Parents (hereafter referred to as clients) were randomly matched with a CPCC and received nine coaching sessions, 20-30 minutes in length, over three months. Coaching sessions were unscripted, and focused on the agenda of the client's choosing. Coaches were asked to employ CALC tools; however, choice of specific tools was left to the coach's discretion.

To explore their experiences with the coaching intervention both during and upon its completion, interviews were conducted with clients at their in-person appointments with the lead researcher at mid-intervention (i.e., 6-weeks into the intervention), and immediately post-intervention (i.e., 3-months). Interviews were conducted at the host university or at the client's home (per their choosing).

All coaches who delivered the intervention (n = 12) were sent two email invitations to partake in one individual, semi-structured, telephone interview with the lead researcher, to gain insights into their experiences coaching in the study. Coach interviews were conducted at immediate post-intervention only. To respect confidentiality between coach-client pairs, coaches

were asked to provide insights regarding their coaching experiences only and nothing specific about the clients.

To limit social desirability, 'honesty demands' (Bates, 1992) were employed during all coach and client interviews (i.e., they were informed that there were no right or wrong answers, nor were specific answers being sought). The lead researcher and/or a research assistant took notes to assist with summarizing key points and enhance data trustworthiness (as per Guba & Lincoln, 1989).

Tools. The research team derived two interview guides (one each for clients and coaches) comprised of semi-structured questions from previous research studies focusing on obesity reduction in various populations (e.g., Newnham-Kanas et al., 2011a; Pearson et al., 2013b; van Zandvoort, Irwin, & Morrow, 2009), and their collective expertise. Clients were asked to share anything they wished about the larger program, and their experience with coaching. Interview questions varied between the two time points. During their interviews, coaches were asked about their experiences with the program, tools they used, insights about working with this population, and advice for other coaches in this field. Table 1 includes questions relevant to experiences of coaches and clients in this study.

Table 1

Semi-Structured Interview Questions

Coach Interview Questions

1) What was it like for you to coach in this study?
2) What surprised you about working with these individuals?
3) What were the tools/techniques you used most often?
4) How did you know, as the coach, that the client got what they were looking for?
5) What insights did you gain coaching individuals/parents struggling with obesity?
6) What advice do you have when working with this clientele?
7) What would you do differently if doing this study again?
8) What else do you feel we should know about your experience?

Client Interview Questions (Mid-Intervention)

1) Please give us feedback on this program, positive or negative, about your experiences so far.
2) Please elaborate on what has assisted with behaviour change and what has not.

Client Interview Questions (Post-Intervention)

1) Please give us feedback on this program, positive or negative, about your experiences so far.
2) Please elaborate on what has assisted with behaviour change and what has not.
3) What did you like best about the program?
4) What parts of the program did you find most helpful, and why?
5) What did you not like about the program?
6) What would you say is the most important thing you learned from being in the program?
7) If we were to provide this program again, what recommendations would you have for any changes we should make?
8) What else do you want us to know about your experience with the program and how it has influenced you, your child, and your family?

Probes for all questions

1) Please say more about that.
2) What else would you like us to know about that?

Analysis. All coach and client interviews were audio-recorded and transcribed verbatim. Transcriptions were analyzed both deductively (i.e., by question) and inductively (i.e., themes came from question responses and were not pre-determined) by two researchers who independently reviewed responses, identified themes, discussed any discrepancies, and determined the most reflective title for each theme (Patton, 2015). To uphold data trustworthiness, the researchers adhered to quality assurance steps during data collection and analysis (Guba & Lincoln, 1989): (a) credibility— reflecting back between interview questions to ensure responses were accurately understood; (b) confirmability—inductive content analysis was completed independently by two researchers, as described above; (c) dependability – researchers reviewed, condensed, and deliberated findings to prevent bias; and (d) transferability—study methods, procedures, and analyses were documented, allowing others to determine whether or not findings are transferable to other settings. Although quotations may be relevant to more than one theme, they are presented in the section in which the quote best fits.

Findings

Qualitative interviews with both clients and coaches resulted in a great number of corroborative statements (N_{words} 6300+), far more than reasonably could be included in this manuscript. Thus, the quotations provided in the 'Findings' tables are not comprehensive but more illustrative of the data collected.

Clients

The sample of clients receiving coaching was homogenous (*n* = 25; *n* = 24 female; *n* = 22 Caucasian). Interviews were conducted with clients who completed their in-person assessments; due to attrition, not all follow-ups could be completed. Client interviews ranged from 6-18 minutes (at mid-intervention; *n* = 17), and 13-52 minutes (at post-intervention; *n* = 16). Data saturation was reached, meaning that there were no new ideas that emerged during the final few interviews (Fusch & Ness, 2015). The following four themes were identified at both mid- and post-intervention time points with regard to clients' experiences with coaching: (a) external support/motivator; (b) change in perspective; (c) goal setting; and (d) increased accountability. At post-intervention, the following additional four themes emerged: (a) positive mental health; (b) increased awareness of parents' and their family's health habits; (c) overall positive experience; and (d) future directions and program improvements.

Client experiences with coaching at mid-intervention. Most clients described how their experiences with coaching had positively impacted their lives (Table 2). For example, they described that coaches acted as an external supporter/motivator by providing them with unbiased guidance, and acting as champions for them and their achievements. It was explained that having this support motivated them to continue to make changes in their perspectives and behaviours. Many clients described that coaches helped them to improve how they felt about themselves by

encouraging them to reframe their self-talk and challenging them to change the ways they viewed themselves and their situations. Clients expressed that they began to realize the importance of prioritizing themselves, and resultantly started engaging in self-care (e.g., PA, making time for hobbies). Coaches also assisted clients with setting progressive and manageable goals for themselves, such that they would start with small challenges and add on as they were accomplished. For instance, coaches encouraged client-identified goals of keeping a food diary or incorporate PA into their daily lives, and reassured clients that small changes were achievements to celebrate. Having an external person to whom they could be accountable and who was invested in and checking on them, reportedly motivated clients to achieve their goals. In addition, when clients faced setbacks in the process of trying to meet their goals, their coaches restructured the setback as something they could work through to move forward.

Table 2

Corroborative Quotations for Coaching Experiences; Mid-Intervention (Clients)

Change in Perspective

- "… She had me doing this 'My Captain' thing … I have been doing it now for about three weeks, and it has actually started to work well, and I have been able to hone in on my captain that lives inside me and find those positive things … when I'm being a little more negative."
- "… Especially with the saboteur … There are things that I do to sabotage myself that I'm not even aware of. It's not that conscious stream through my head of negative thoughts … So, she was able to point that out and help me sort of work through how to stop doing that."

Accountability

- "Just knowing that you're out there, somewhere, even helps. … 'Cause any kind of accountability helps me. … If I'm only accountable to myself, I just say 'Pff.' … I let myself off the hook easily. … If I don't feel any outside pressure."
- "Knowing that I'm going to…talk to her again, so she's gonna [ask], 'So, what did you do?' … It's nice having that accountability. … Which is totally different than … if I was just looking at the PowerPoints.

External support/motivator

- "[My coach] got me to actually do a longer food journal … more details and say like, how I'm feeling when I eat. … She kind of challenged me on some of the things that I did. … She's been really helpful."

Goal Setting

- "A lot of the time… I'm talking about … how stressful my schedule has been, … [my coach will] say, 'Okay, so what are you going to do to diminish or help cope with that stress, and what have you done in the past, and what's working for you, and what's not?' … It always in some way relates back to my main motivation."

Client experiences with coaching at immediate post-intervention. Similar themes emerged from client interviews at mid- and post-intervention follow-ups. At post-intervention, clients reiterated the positive impact of coaching on their lives in that they appreciated having external support, changing their perspectives, assistance with goal setting, and a source of increased accountability. It was emphasized clients felt coaches were trusted people they could consult when they were feeling despondent or needed reassurance. Clients again explained they began prioritizing themselves more than they had previously and realized the importance of doing so. They also recognized the impact of addressing and resolving excuses that may have prevented them from engaging in healthy behaviours. Clients admitted that the concept of coaching felt foreign and uncomfortable at first; however, they enjoyed having someone outside of their usual social and familial circles to talk with about their lives. Having coaches who encouraged clients to celebrate their successes was something they found supportive and motivating.

Upon program completion, four additional themes were identified from client interviews. In working with their coaches to identify and work through sources of their less healthy behaviours, clients began experiencing improved mental health compared to before the program (i.e., more positive feelings and functioning). Clients explained that their coaches encouraged them to reflect on events or habits from their past to identify how certain unhealthy behaviours may have developed. Then, coaches assisted clients with addressing and resolving feelings associated with root causes of their behaviours, to help clients move forward. Clients expressed

while this process was uncomfortable, working through emotions allowed them to improve their mental health overall. Through coaching, a majority of clients reported increasing awareness of their own and their family's habits, and of the interrelated nature of the relationship between mental and physical health. Many clients became aware of the role of food in their lives; some felt they engaged in emotional eating, and others felt their social interactions centered on food and meals. Clients shared that coaching allowed them to address issues in all aspects of their lives, not only nutrition and PA, and managing these issues allowed them to make improvements in their health behaviours and those of their families. Throughout their sessions, all clients felt that coaches were unbiased and understanding, which made clients feel comfortable when working on their emotions and behaviours.

Overall, clients felt coaching was a positive experience. Clients perceived that coaches provided them with support, motivation, and encouragement that they were not receiving elsewhere, and helped clients improve their mindsets. Coaches were able to help the client view themselves as a whole, instead of focusing solely on PA or nutrition behaviours. Clients expressed that coaching was not something they would have sought for themselves but were happy they received it. They felt the sessions were convenient (given they were telephone-based) and enjoyed being able to complete the program from their homes. Some clients suggested making coaching sessions longer and incorporating a face-to-face option as improvements for future implementation. These clients described that, at first, telephone sessions felt awkward given that they could not see their coaches' expressions or body language. Quotations illustrative of client coaching experiences at immediate post-intervention can be found in Table 3.

Table 3

Corroborative Quotations for Coaching Experiences; Immediate Post-Intervention (Clients)

Increased accountability

- "Each time [my coach and I] talked, we finished with some goals that I was gonna work towards, between the sessions, and so… knowing that I had someone to talk to, or… was gonna have to answer to, it helped me to stick with the goal."

Change in perspective

- "And for me, I kind of realized that these 10 pounds, it's not gonna make or break me, either way. My husband and I, we just had our 11th anniversary. And I look back on that, and I'm like, I'm 15 pounds heavier than my wedding weight… Like, it's not that bad."
- "Something that my coach used to say, she's like 'baby steps, you don't have to, you know just be this new person, just take tiny baby steps.' And that's the same thing with exercising and nutrition, it's just if I take the little steps they lead to better activities, in general."

Mental health improved (addressed root causes)

- "[My coach and I] discussed the issues surrounding why I was eating the way I was eating and where that stemmed from, and what are some ideas to cope with that and way to work around that."
- "The coach was very good at being able to, like, help work through some stuff. I had some stressful stuff… that had nothing to do with food or nutrition. That he helped with, as well."

Increased awareness

- "The most important thing I learned [from coaching] … is probably more about myself than anything… I long ago stopped making the choice to use food to fuel my body. And I was using it for other things [such as comfort], so I wasn't looking at food as what it was actually intended to do for us. And I wasn't consciously making those decisions. …

External support

- "Having the personal coach [was most helpful]. … Having someone to talk to about goals and someone that could help me through a couple of difficult situations, and [be] someone to turn to. … It [was] unbiased, so it wasn't like turning to a family of friend who might be more biased.

Positive overall

- "[My coach and I] talked about my creative side and I just felt like it was unleashed during the conversations with her. It was just like she gave me permission to let it out and, and now I just feel light and free and like I can do anything."

Future directions or improvements

- "I think that [coaching] could have been longer… it seemed like we were just starting to get to like a great point. … I think [keep] the nine sessions but longer definitely. … I feel like [I'm] just starting to get like that ripple effect [from coaching] right now."

Coaches

Of the 12 potential coaches: (a) eight coaches agreed to be interviewed; (b) one was unavailable; and (c) three did not respond. The interviews with coaches ranged from 30-51

minutes. Five themes and 10 sub-themes emerged, which outlined coaches' views regarding their participation in this study: (a) positive coaching experiences (rewarding and/or enjoyable; study format; high client engagement; noticing changes in client); (b) challenging coaching experiences; (c) implementing coaching tools (building self-awareness/reflection in client; changing client perspectives; accountability and goal setting; giving clients space to work and develop); (d) working with this population (surprising findings; address whole environment/person/root causes); and (e) future directions and advice for other coaches. Data saturation was also reached during coach interviews.

Positive coaching experiences. Coaches reported mostly positive coaching experiences and described their involvement with their clients as rewarding and enjoyable (Table 4). Coaches explained that they felt they were making an impact in their clients' lives and they looked forward to their sessions and using their coaching tools. Some stated that this experience reaffirmed their passion for coaching. Coaches felt telephone calls were an appropriate medium for communication and that the 20-30-minute sessions allowed them to target clients' behaviours sooner than they would have in their traditional 60-minute sessions. Coaches perceived that, when discussing sensitive issues such as obesity, the telephone acted as a shield for their clients, which coaches reported as beneficial for clients. With overweight/obesity being visually-identifiable conditions, coaches felt the over-the-phone format enhanced the feeling of a safe, non-judgmental space that allowed the clients the comfort needed to be vulnerable and work through these sensitive topics.

Coaches who worked with highly engaged clients (as perceived by the coach) described feeling professionally impactful through their involvement in this study. They viewed clients as willing to trust the coaching process and explore their feelings and behaviours at a deep level,

which made them feel helpful and valuable. Coaches also explained feeling valued when they noticed changes in their clients — they observed clients taking more control of coaching sessions, and of situations in their lives. They talked about clients' shifts in energy levels from the start to end of the study, such as a steady increase in enthusiasm, excitement, and self-confidence among clients over time. Coaches also perceived that clients had started to value themselves, and had a higher perception of self-worth than they had at the start of their time together.

Table 4

Corroborative Quotations for Positive Coaching Experiences (Coaches)

Rewarding and/or Enjoyable Experience

- I felt very useful… as a coach, because… they… were open to learning and exploring the whole process… I felt useful."
- "Working in this way with the 20-30 minute sessions. …I just really saw the power in that again and how, people can shift super fast."

Study format

- "Most of the time I do [my coaching over] the phone. And I find, too, even with a situation like this it might have been easier just for them to talk on the phone. … sometimes it's easier to talk on the phone about weight, about ourselves, when we're not in front of that person. Feeling like we're being judged."

High client engagement

- "I found it easy [to coach in this study], based on the fact that it was on the client's agenda, what the client wanted… On the client's timeline, really. It's [obesity] a big topic so it's not like we're hitting on a specific area or situation."

Challenging coaching experiences. Experiences with client engagement varied among coaches, and that level of engagement was described as impacting the coaches' experiences. A few coaches who felt their clients were not open to coaching described their sessions as challenging (Table 5). They felt that their less engaged clients were hesitant to share some aspects of their lives with them, rendering the coach unable to guide the client into deeper explorations of their experiences and learning. These coaches perceived their clients as seeking a

'quick-fix' solution to their nutrition and PA behaviours, and some were hoping for advice as opposed to engaging in self-reflective problem solving with the support of their coach. Some coaches perceived their clients to be distracted at times during their sessions (e.g., when children were in the room), which they felt reduced the client's engagement in the sessions and overall coaching experience. Although coaches would request the client find a private space where they could be alone during the sessions, clients did not always comply. Scheduling conflicts and missed appointments were also barriers that coaches faced. Coaches felt that because the researchers, rather than the clients, were financially responsible for coaching sessions, some clients seemed less likely to fully engage than if they had a personal financial investment in the intervention.

Table 5

Corroborative Quotation for Challenging Coaching Experiences (Coaches)

- "[The client] would bounce back to wanting a solution for her weight problem, in other words… 'what are the tips, what do I do?' That sort of thing, so getting [them] to understand that [they have] a solution and it's much deeper than that."

Experiences implementing coaching tools/techniques. Coaches were asked to describe the tools and techniques they used most often in this study (Table 6). Although sessions were tailored to each client, coaches described using similar, commonly used CALC tools; a detailed description of tools/techniques used by coaches in this study can be found in Table 7. Coaches in this study reported using tools including but not limited to: (a) active listening and reflecting back; (b) encouraging clients to keep daily self-reflection journals; (c) open-ended questions; (d) identifying saboteurs and captains; (e) being genuinely curious; (f) the wheel of life; (g) process, balance, and fulfillment coaching; (h) focusing on the whole life of the clients not merely on PA or nutrition; and, (i) holding the client as naturally creative, resourceful, and whole. The

techniques assisted clients with developing their own self-awareness and self-reflection skills, and encouraged them to reflect on a deeper level to help them understand what was contributing to them engaging (or not engaging) in certain behaviours, and/or what feelings contributed to their actions. Assisting the client with identifying their saboteurs and captains allowed clients to reflect on their self-talk, and explore their 'inner voice,' and the impact it had on their decisions to engage in certain behaviours. By being curious about the client and using open-ended questions, coaches assisted clients with developing self-reflection and self-awareness techniques thereby enabling them to better understand what was holding them back, and how to address it. Furthermore, through balance coaching coaches described that they were able to challenge their clients and urge them to change destructive perspectives toward themselves and their habits. Shifting perspectives helped clients redirect their thoughts to be more positive, reminding them there was no 'right way' to change their habits, and trying to associate feelings with actions. Coaches and clients also explored the root causes of less healthy behaviours, which included stress, anxiety, using food as a comfort or distraction, or feeling undervalued. The coaches stressed that it was imperative to help clients assess what was causing their engagement in less healthy behaviours and preventing them from changing.

Some coaches implemented the 'wheel of life' tool to help clients to determine areas in their lives they wanted to focus their improvement efforts on. Others used fulfillment and process coaching to further encourage clients reflect on their values, their roles in relationships, how their actions made them feel, and what they would like to improve in their lives. Interestingly, coaches also challenged clients to treat themselves the way they treat their child(ren). For instance, some parents were reportedly very focused on encouraging healthy

habits in their child(ren), even though they did not seem to have that same investment in themselves.

Through having clients identify their own agendas for their sessions and their lives, coaches helped clients with realistic goal setting and following through on those goals. Specifically, coaches explained that their clients were primarily responsible for identifying their goals and together, they refined them to be manageable and with set timelines. Coaches then used accountabilities to help their clients fulfill each commitment they made and, in addition to inquiring about progress during sessions, they would often challenge clients to push themselves further toward their larger goals. Some coaches also noticed that through the achievement of their goals, and in taking control of their decisions, clients seemed to feel empowered to maintain the changes they were making. The coaches observed that many clients began standing up for themselves (to other family members) and implementing changes.

In addition to assisting with goal setting and empowering clients, coaches emphasized the importance of creating a safe space for clients to work and develop. They explained that this safe space must be apparent at the beginning of coaching sessions in order to develop trust with the client. Coaches stated that this working agreement or designed alliance was the foundation of the coaching relationship, and allowed and encouraged clients to explore their feelings. When coaches showed compassion and understanding, they perceived clients as being more likely to share their thoughts and feelings.

Table 6

Corroborative Quotations for Experiences Implementing Coaching Tools/Techniques (Coaches)

Building self-awareness and self-reflection in client
- "[Asking her] 'On a scale of one to ten, how happy are you with your personal relationship with your partner?' … So I would use that and then and I would bring

that up at different times, about different areas of her life, and from that I would then delve in with 'what would make it a higher number?'"

Changing client's perspective

- "And so when you put your client, in kind of in the shoes of her daughter like… if your [child] had this problem, what would you suggest to her? And the client would say 'oh I would suggest A, B and C' … and I said '…how about for yourself looking in that same perspective?'"

Creating accountability and goal setting skills in client

- "Between every session they would have accountability, and what's interesting is that a lot it would come from them. … so it was connected to the conversation like a natural evolution."

Giving client space to work and develop

- "I think the power of coaching is in the relationship so it's really about setting it up at the beginning, so that it is a safe and trusted place. And then, how you interact [with the client so] that they feel heard, and that you really care. … I think I was just… compassionate."

Table 7

Co-Active Coaching Tools Used Most Frequently in this Study by Coaches

Tool	*Description*
Identifying 'Saboteur'	Encouraging clients to explore patterns, triggers, and feelings and/or people that were preventing them from making changes or causing them to feel negatively about themselves.
Identifying 'Captain'	Inner feeling/voice that encourages client, and helps them overcome self-defeating limitations
Balance Coaching	Help client develop new perspectives; create a plan of action grounded in commitment to what is most meaningful in client's life.
Fulfillment Coaching	Help client discover their values, identify self-defeating influences, and facilitate opportunities for them to create lives that center around what makes them feel most alive.
Process Coaching	Focuses on internal experience and what is happening in the moment. Help clients work through emotionally charged issues. Meeting the client wherever they are emotionally, even when experiencing emotional 'turbulence.' Encouraging client to identify emotions associated with an

	issue.
Wheel of Life	Clients are asked to identify their values, and rank them based on perceived importance, then level of satisfaction at that moment in time
Accountability	Identifying someone or some way to or for clients to be overt in their change goals
Creating safe space for client	Communicating with the client that they were co-creators in the sessions, the client could share any feelings that may arise, and coaches would pass no judgment.
Open-ended questions	Cannot be answered with yes/no. Invite elaboration and deep thinking regarding an issue
Genuinely curious	Questions that evoke personal exploration. Using curiosity creates a partnership with client, as opposed to coach being the expert in that both coach and client are exploring feelings/issues and designing solutions
Client is Naturally Creative, Resourceful, and Whole	People are capable of finding their own answers, choosing and taking action, and capable of recovering from adversity and learning from those experiences. Coach helps guide client into realizing they have their own answers.

Source: Tools defined by Kimsey-House, Kimsey-House, Sandahl, & Whitworth (2018).

Insights gained from working with this population. When asked to share their insights about working with this population of parents with overweight or obesity, many coaches described what surprised them, and underscored the importance of addressing each client as a whole person, rather than one behaviour or condition (Table 8). Coaches expressed that they were most surprised by the success of their coaching relationships — which they viewed as helpful for facilitating improvements in their clients' attitudes and behaviours — and the willingness of most clients to engage in coaching, despite being randomly assigned to coaching, and randomly paired with a coach. They explained that clients seemed open to hearing different perspectives and trying different approaches for working on their health behaviours. Coaches were also surprised that many clients prioritized their children more than themselves. In addition,

it was unexpected by coaches that most clients did not want the focus of their sessions to be on weight, healthy eating, or PA. They explained that clients were more interested in reducing less healthy behaviours, and developing healthy lifestyles overall. Sometimes, this involved focusing on aspects of their lives (seemingly) unrelated to healthy habits, such as self-esteem, relationships, and connectedness. Once these larger issues were addressed, clients and coaches were able to concentrate on more specific health-related behaviours. Many coaches explained that they felt changes in their clients' health-related behaviours did not occur until their final few sessions, after stressors and barriers were addressed.

Table 8

Corroborative Quotations for Insights Gained From Working With This Population (Coaches)

Surprising findings
- "So being an anonymous… match [between coach and client in this study], there was the ability for [clients] to show up and just go deep anyways and trust the process [which was surprising]. … [W]hen you create the right space for that vulnerability and deepness and willingness to share… it's … a refreshing surprise really to see that."
- "[What surprised me was] where we had to go to get started. … I know what the study's all about and I was there to be with them with that part, that aspect… but all three [clients] were overwhelmed with life. … Well my focus was self-esteem, building up the client so that they were able to be proactive. And all three of them embraced that eventually, but at different times over the coaching period."
Address whole environment/person/root causes of unhealthy behaviours
- "I think my client knew how she was being but didn't ever have to voice it or confess it. So just having those open conversations and kind of opening that closet door to some of her 'grungies'… really helped her kind of realize it's not so bad or maybe she's not so bad… [Be]cause she did have some anxiety issues. …And then that would always come back to food in some way shape or form."
- "[Clients] are coming in already feeling super vulnerable, and that the obesity isn't them, they're not obesity, obesity is something… that they are dealing with. They're they are a whole person more than that."

Future directions and advice for other coaches. When asked what coaches would have done differently and for advice to give to other coaches who work with parents with

overweight/obesity (Table 9), many coaches advised the most important tool is active listening – listening with compassion and without judgment. They stated that it was (and is) important to allow these clients to explore all aspects of their lives, instead of solely focusing on PA and nutrition, in order to understand best where to make changes. Coaches reiterated the importance of designing a collaborative alliance with clients from the outset of the sessions, in that creating this safe space sets the tone for the entire coach-client experience. Additionally, coaches stated that clients need to be met at the stage that they are at, and not pressured or forced to move at a faster pace. They reminded other coaches that the clients need assistance with accepting themselves where they are at, and should be provided support to do so. Furthermore, coaches stated that the clients have their own solutions, and that they mostly need assistance with redirection of thoughts, and identification of saboteurs in their lives.

In terms of what coaches would do differently if participating in this study again, some coaches expressed wanting an increased number of sessions, longer in duration (i.e., one-hour sessions), while others were content with the current study design. Some coaches would have liked a 'matching system' to ensure that they and their client(s) were compatible. Coaches explained that if doing this study again, they would ask clients what their motivations were for joining the study in order to gain a better understanding of where the client was at before progressing deeper into their sessions. Two coaches also suggested that the researchers could have provided more information to clients about the coaching approach, at the outset, to ensure that clients had a clearer idea of what their sessions would be comprised of prior to being assigned to their coach. Lastly, some coaches stated that they would make their expectations of the client and session goals (i.e., limit distractions during coaching, provide more notice when

canceling sessions) better known from the beginning of the study to avoid their clients' missed appointments and distracting environments.

Table 9

Corroborative Quotations for Advice for Other Coaches and Future Directions (Coaches)

- "[A] less experienced coach might be sort of rushing to deal with and cover the weight loss part and get there… I just had to trust myself as coach, trust my client… really being patient and then when the time is right you, in good time, get to where you need to get to."
- "I guess my bottom line advice would be know what the study is all about. But meet the client where they are … And my gut says if I had just focused on food, food prep or shopping or whatever, the exponential takeaway would not be there."
- "Just listen. … One of our coaching pillars is everybody is naturally creative, resourceful and whole… they know their own needs and wants, they have their own answers you just have to listen to them and then kind of redirect it back to them."

Discussion

This study qualitatively examined the perspectives and experiences of parents with overweight/obesity, and the coaches who worked with these parents, in a 3-month coaching intervention. Clients described meaningful, life-changing experiences that included and transcended obesity-related behaviour changes. From our findings, it was reported that as a group, coaches felt a sense of satisfaction working in this study, and they were pleased and even surprised that most of their clients appeared engaged with the coaching. The most utilized tools shared by the coaches are the foundational skills of CALC (Kimsey-House et al., 2018), and ones that other CPCCs have reported as effective for eliciting behaviour change in individuals with overweight/obesity (Newnham-Kanas et al., 2011b). Thus, the findings about which tools seemed most useful are consistent with previous research as discussed below.

The importance of working with clients where they were at and designing a collaborative alliance between coach and client were reportedly pivotal in the current study, as has been found

previously. Similar to findings shared by both clients and coaches in the current study, O'Brion and Palmer (2010) examined experiences of clients and coaches from a variety of disciplines (i.e., executive, business, life) and found both coaches and clients felt key elements for an effective coaching relationship included: trust; self-awareness; co-creation of the coaching relationship; openness; adapting to the client; and listening. Stober and Grant (2006) contend that "the foundation of effective coaching is the successful formation of a *collaborative* relationship" (p. 360).

Through their involvement in the current study, clients reported that they felt supported and listened to, which seems consistent with coaches' reflections that active listening was the most important tool they used. The importance of active listening has been highlighted in previous research, in which health coaches identified being an engaged listener as the most substantial tool in their practice (Huffman, 2010). Use of active listening in this study likely contributed to coaches learning the importance of viewing populations with overweight/obesity as more than their behaviour or condition, and addressing them in their greater or whole life context. Even though addressing a client's whole life is a primary tenet of the co-active approach (Kimsey-House et al., 2018), from their sessions, coaches were surprised to learn that clients wanted to focus on other aspects of their lives (e.g., stress management) that appeared to be unrelated to health behaviours; addressing these larger issues reportedly resulted in positive behaviour change in clients. Clients stated that being able to address different aspects of their lives, unrelated to PA and nutrition, allowed them to focus their minds and deal with greater stressors, which in turn led to addressing health behaviours. Focusing on one's relationship with his/herself is an important precursor to behaviour change, as has been reported in previous health-related CALC studies (Fried & Irwin, 2016; Mantler et al., 2010; Newnham-Kanas et al.,

2011a). Researchers have noted that the necessary catalysts for behaviour change in individuals with obesity include: (a) supporting them with changing their thinking, attitudes, and relationships; (b) a positive self-view; and (c) internal motivation (Kausman & Bruere, 2006). Therefore, providing individuals with obesity with opportunities to learn about themselves and their weight, and empower them in finding their own solutions (as per the tenets of CALC; Coaches Training Institute [CTI], 2019) may result in positive behaviour changes (Kausman & Bruere, 2006; van Zandvoort, Irwin, & Morrow, 2008).

Clients reported their coaching experience was helpful and valuable, and coaches felt valued and perceived their clients to be moving toward more positive health behaviours. These positive experiences for both coach and client resulted in high levels of enjoyment and engagement for both parties. Newnham-Kanas, Morrow, and Irwin (2012), reported similar findings when they evaluated what coaches enjoy about coaching. The coaches (n = 351) conveyed that observing meaningful changes in their clients' lives, creating a collaborative relationship with clients, and using their coaching skill set all contributed to their enjoyment and commitment to their coaching practices (Newnham-Kanas et al., 2012). It has been suggested that commitment to coaching, and believing it is of value to clients, enhances the coaching relationship and may result in the success of coaching as an effective intervention for individuals with overweight/obesity (Newnham-Kanas et al., 2011b; 2012; Pearson et al., 2012; van Zandvoort et al., 2008; van Zandvoort, Irwin, & Morrow, 2009).

It is possible that the higher capacity to implement and maintain healthy changes that clients experienced through coaching was a result of improvements in their self-efficacy. That is, previous researchers have found that shaping the choices, goals, emotional reactions, effort, and coping of an individual results in greater self-efficacy, which is a predictor for behaviour change

(Ammentorp, Thomsen, & Kofoed, 2013; Bandura, 1977). Having an external supporter/coach to aid clients in addressing underlying causes for their behaviours and increasing awareness of their values likely contributed to these self-efficacy components. Through coaching, clients reported prioritizing themselves and experiencing a sense of more positive mental health than before the intervention began. Similarly, in their study assessing the impact of CALC on adults with obesity, Newnham-Kanas and colleagues (2011b) found participants identified support as critical to their success in managing their weight, and that the supportive relationship with their coach provided them with security and encouragement.

As outlined by coaches and clients alike, it was suggested that future studies could include more frequent or longer (i.e., one-hour) coaching sessions, and/or the option for face-to-face interaction (e.g., video-calling). The principles and dynamics between face-to-face and telephone coaching have been deemed similar, with telephone coaching found to be both more convenient and as effective as face-to-face coach-client interactions (Berry, Ashby, Gnilka, & Matheny, 2011; Bohlin, Hagman, Klaesson, & Danielsson, 2017). Although the time frame of 20-30 minute coaching sessions used in the current study was selected because of its effectiveness in other health-related coaching interventions (Fried & Irwin, 2016; Goddard & Morrow, 2015), the desire for longer sessions with face-to-face options noted by a few clients and coaches should be considered moving forward to enhance the external validity of the work. Interestingly, although not mentioned by any clients, coaches felt conducting sessions over the telephone allowed clients to feel safe and at-ease to work through sensitive topics. Although not clear, it is possible that coaches held beliefs about their clients' self-presentation concerns that were not actually present for the clients. Arora and colleagues (2019) noted that biases associated with obesity can be unconscious, including among those providing support and care.

Interestingly, in some cases, what coaches viewed as challenges, clients reported as positive experiences. Specifically, where coaches felt challenged and frustrated when clients had their children in the same room as where coaching sessions occurred, clients felt that being able to conduct their sessions at home, with their children nearby, was a strength of the program because it was flexible and comfortable. Coaches found scheduling conflicts to disrupt the flow of their sessions whereas some clients reported that being able to reschedule sessions stretched the program out over a longer span of time, thereby allowing clients more effectively to integrate their behaviour changes into well-established habits. These differences in perspectives may be due to discrepancies in expectations in coaches compared to clients and may be the reason some coaches advised other coaches to make their expectations clear prior to beginning their sessions. Coaches recommended providing clients with a more in-depth understanding of what coaching entails and employing a matching system to ensure coach-client pairs are compatible; both of these suggestions seem viable ones to consider in future, type-alike studies. Other researchers have recommended similar strategies, such as allowing participants to choose their treatment allocation (Pearson et al., 2012). Perhaps these challenges could be minimized via more thorough communication among researchers and coaches during their designed alliance/relationship process prior to any intervention. The two groups – coaches and researchers – could brainstorm ideas and methods to circumvent these challenges through stronger designed alliances; full explanations of the purpose of coaching; and the need for full commitment to coaching calls.

Limitations

A limitation of the current study is its homogenous sample of parents with obesity which limits the transferability of the findings. Furthermore, while certified coaches from one approach were utilized to help ensure uniformity of the coaching intervention, and these coaches were

asked to use only their CPCC tools, there was no coaching fidelity measure utilized to ensure that the intervention was, in fact, a reflection of what the coaching approach was intended to be. In addition, as coaches were not asked to keep a detailed log of tools and techniques they utilized in their sessions, recall bias may have occurred. Finally, it must be noted that self-selection bias may have influenced the high motivations found in the study samples. Individuals with obesity who volunteer for health-related programs might be more committed to changing their lifestyles than those who do not choose to join such a program (Wadden, Brownell, & Foster, 2002).

Strengths

Conducting interviews with clients at different time points allowed researchers to discover shifts in experiences with the program and coaching. In addition, gaining insights from both stakeholders (i.e., client and coach) will allow researchers and professionals in the field to use these findings to design more effective programs in the eyes of both coaches and clients. Rigorous techniques and methods were employed for gathering and analyzing qualitative data, including: (a) utilizing methods for data trustworthiness; (b) outlining negative cases (i.e., feedback that may not describe positive experiences and may be critical information for program improvement); and, (c) data source and investigator triangulation (i.e., comparing different perspectives of individuals in a program; using multiple analysts to reduce bias; Patton, 1999).

Conclusions

The importance of this research centers on contributing to the field of obesogenic-focused coaching and providing coaches with concrete suggestions and protocols with which to frame their coaching sessions with this population. This feedback might contribute to a more positive coach-client experience.

The implementation of CALC in this study resulted in positive experiences for both coach and client. Coaches felt an increased sense of professional self-worth, while clients felt they had an external supporter who allowed them to explore opportunities that resulted in behaviour change in a safe environment and process. We would assert that the perspectives and experiences described by the clients and coaches in the current study corroborate, qualitatively, the viable impact and potential of CALC on important health behaviour changes. Based on these findings, CALC was perceived as an effective method to support and promote positive health-related changes in clients. The importance of focusing on and encouraging parents with obesity to improve their own behaviours also resulted in them reporting in improvements in the behaviours of their families. Thus, by focusing on themselves, clients were able to create a more positive health environment for them and their families. Finally and importantly, through participation in this study, coaches reported reaffirming their enjoyment and value as a coach, a factor of primary importance in working effectively with clients on health behaviour issues.

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Chapter V: Summary of Findings, Implications, Researcher Reflections and Future Directions, and Conclusions

Summary of Findings

To serve as a reminder, the overarching purpose of this dissertation was to assess the impact of a coaching and/or health education intervention on parents with overweight/obesity and their children (ages 2.5-10, of any weight). A total of 50 parent-child dyads were randomized to the intervention (coaching and health education) or control condition (health education only) using a 1:1 ratio. Three distinct articles were written to provide insight into: (a) the study rationale with a focus on the methodological foundations of the program; (b) the impact of the program on parent and child dietary intake and physical activity (PA), as well as parental BMI, waist circumference, and motivation to engage in healthy behaviours; and, (c) qualitative explorations of parent and coach experiences of program involvement.

The first article, presented in **Chapter II**, provided a detailed account of methods used in this research, including a detailed rationale and description of the intervention and data collection tool used to produce the findings presented in the subsequent articles. Given that this intervention is, to the researchers' knowledge, the first of its kind, the intention of providing detailed methods is to inform the development of future obesity prevention approaches for parents and children, and subsequently, the family unit.

The study presented in **Chapter III** revealed that the dietary intake of parents and children in both groups fluctuated. There were no statistically significant differences across time or between groups related to children's PA or dietary intake, or parents' PA, dietary intake, motivation to engage in healthy behaviours, or body composition. Decrease in sodium intake in parents in the intervention group showed a trend toward significance from baseline to 6-month

follow-up. This might have been due to a reported increase in awareness of nutrients in foods, or being better able to understand nutrition labels. Parents in both groups described that their and their families' health behaviours changed over the course of the program. Some parents in the control group explained that the program did not have any impact on themselves or their families, whereas this was not a common theme reported by parents in the intervention group. Interestingly, the heath education webinars seemed to influence the behaviours of some parents in the control group in that they recorded and reported increased PA and decreased consumption of unhealthy foods – in some cases more so than parents in the intervention group. Experiences varied within and between groups at 6-month follow-up. Some parents in both groups expressed that the program was life changing for them, whereas other parents in both groups developed ambivalence toward behaviour change. Parental motivation to engage in healthy behaviours was high at baseline, and remained so for the duration of the study. As such, a possible ceiling effect may have occurred. Based on qualitative responses, both intervention and control groups benefited from the program, and reported positive program experiences.

In **Chapter IV**, several complementary findings were reported between the intervention parent and coach interviewees. Parents described that they enjoyed being able to identify and work through root causes of their behaviours, they felt supported and listened to, they changed their perspectives toward behaviour change, and felt better able to set goals and achieve them. They felt coaches held them accountable, which assisted them in implementing behaviour changes for themselves and their families. These findings substantiate those from the study presented in Chapter III, wherein parents in the intervention group improved their health behaviours; in Chapter III they explained that through coaching they felt motivated to set health-related goals with their coaches (e.g. limiting their convenience food consumption, or making

time for themselves) and follow through with those goals. Some parents explained that their goals were not health-related, but in addressing other stressors they were better able to change their health behaviours. Overall, coaches enjoyed working in this study, and were pleased – and even surprised – that parents were engaged with coaching. Coaches reported that the most important tool they used during their sessions was active listening. They explained the importance of meeting clients where they were at, and assisting them in working through only the changes that they were ready for. Coaches were surprised to learn that many parents did not want to solely focus on PA or nutrition goals, but rather other aspects of their lives that might have been preventing them from implementing healthy behaviours. It was also surprising for coaches to learn that many parents they worked with had trouble prioritizing themselves. Both coaches and parents suggested that future programs should have more frequent or longer (i.e., one hour) coaching sessions, and the option for face-to-face interaction (e.g. video-calling).

Implications

Despite the limitations in each study (as detailed in Chapters II-IV), the overall findings of this body of work contribute and provide new insight to the field of parent-child interventions for obesity prevention. First, a detailed methodological account of the intervention will assist researchers and health professionals with information to develop prospective programs aimed at reducing obesity incidence and its associated health conditions in the family unit.

In conjunction with other research, the qualitative findings from this dissertation support that engaging parents and their children to target specific behaviours (e.g. increase step count) increases their motivation to do so, which in turn results in improvements in those behaviours (Brown et al., 2016). It has been reported that this effect is further amplified when families spend time planning these behaviours (Brown et al., 2016; Rhodes, Naylor, & McKay, 2010). Parents

who participated in this program of research explained that their involvement in the program encouraged them to meal plan and to allocate specific times for PA as a family, which helped facilitate uptake and maintenance of healthy eating and increased PA. Self-monitoring combined with goal setting has resulted in positive behaviour changes in family-based health behaviour interventions (Keane, Layte, Harrington, Kearney, & Perry, 2012; Kimbro & Denney, 2013). This was exemplified by parent participants in that they explained that using pedometers and recording dietary intake increased their awareness of their and their child's habits, and thus made changes accordingly. Parental motivation to engage in healthy behaviours was high in the current study, based on TSRQ scores, and remained so throughout the duration of the program. This may have been the case because parents were ready to make changes to their health behaviours (Ellis, Berio, Carcone, & Naar-King, 2012), or perhaps participating with their child resulted in them feeling more accountable to make changes. This is consistent with previous research, which states that parental motivation is significantly related to engaging in and completing treatment, and that high motivation scores in a program may be reflective of the parents' readiness to change (Ellis et al., 2012). In their interviews, many parents described that, through their involvement in the program, they became aware of the extent to which their behaviours impacted their children, and as such began to model healthy behaviours in their homes.

While quantitative findings and qualitative responses were mixed with regard to the impact of the program on control and intervention groups, decrease in sodium intake in parents in the intervention group showed a trend toward significance ($p = 0.04$) from baseline to 6-month follow-up. Though not statistically significant, it can be speculated from this finding that coaching interventions have the potential to impact nutrition behaviours. However, perhaps a longer follow-up time (i.e., past 6-months) is required to determine whether changes in dietary

intake were made, but were not reflected in quantitative data. Child dietary intake and PA quantitative results were also not statistically significant. It has been suggested that targeting additional caregivers in the household or family may be needed to improve dietary outcomes in children, given that they live in complex, interconnected environments (i.e., multiple caregivers/households; Bean, Wilson, Thornton, Kelly, & Mazzeo, 2012). Program benefits (e.g. accountability, goal setting skills, identifying root causes of behaviours, change in perspectives) were more salient in responses from parents in the intervention group than those in the control group. In a 12-week obesity treatment study for university students with obesity, it was noted that while both groups benefited from their involvement in the study, the control group (who received education) gained insights into practical aspects of behaviour change, whereas the intervention group (who received CALC) were able to focus on underlying causes of their behaviours (Pearson, Irwin, Morrow, Battram, & Melling, 2013). These findings are consistent with previous research which states that, while education is effective in changing knowledge toward health behaviours, education alone is insufficient in changing behaviour (Beech & Klesges, 2003; Chen, Weiss, Heyman, & Lustig, 2009).

The research presented in this dissertation provides valuable insights for coach-client relationships in the field of obesity treatment and prevention. Parents who received coaching described their experiences as beneficial, in that they appreciated having an external supporter to help them set goals and stay accountable for keeping those goals. They described that in working through the root causes of their behaviours, they were able to adjust their perspectives toward behaviour change, and consequently felt motivated to make changes. They felt their coaches were understanding and allowed them to work through their ‘inner’ conflicts. Certified Professional Co-Active Coaches (CPCCs) in this study perceived that their clients (i.e., parents

in the intervention group) benefited from their sessions, which resulted in coaches feeling valued. They described that the most important tool they used was active listening and meeting the client where they were at. Similarly, the CPCC who worked with individuals struggling with obesity in a study conducted by Newnham-Kanas and colleagues (2011b) noted that dropping their assumptions about clients and tailoring sessions to each client's comfort level allowed them to better collaborate with their clients. The CPCC explained that even though clients joined a study to help them lose weight, they may not have realized that they were not yet ready to take steps toward behaviour change that would facilitate weight loss (Newnham-Kanas et al., 2011b). Thus, it was expressed that allowing the clients to set the agenda for coaching sessions, and explore their emotions regarding behaviour change would assist with developing positive coach-client interactions (Newnham-Kanas et al., 2011b). Interviews with both clients and coaches allowed the researchers to identify similarities in their experiences partaking in this program. Importantly, a few differences in experiences were also identified. One such example was that some coaches noted it was challenging when parents were distracted by having their children in the same room during sessions; conversely, parents appreciated being able to conduct sessions in their homes without having to worry about going elsewhere or arranging childcare. Differences in experiences inform future researchers on how to better tailor programs for both parents and coaches. Identifying and managing expectations of both groups would allow for more focused sessions, in which parents benefit by being more engaged and coaches feel their sessions are being valued. As CALC has been utilized to elicit behaviour change in various areas, suggestions and feedback from CPCCs who have experience in working with a particular group of individuals can strengthen future coach-client interactions in that field (Newnham-Kanas et al., 2011b).

Researcher Reflections and Future Directions

The collection of studies presented in this dissertation provides insight on the impact of and experiences in a parent-child coaching and/or health education program to target obesity-promoting behaviours in the family unit. This work also provides recommendations and opportunities for future research in this field.

Although many participants reported benefitting from their involvement in this research, recruitment and retention of study participants were challenging. Recruitment spanned the course of one and a half years, despite utilizing various media avenues for advertising, obtaining the target sample size (N = 50 dyads) proved to be difficult. This may have been due to lack of interest in the target population, parents not being ready to address their behaviours, or the availability of other program options offered throughout the city that were found to be more appealing to the target group. Obesity prevention studies are notorious for high dropout rates, with attrition rates ranging from 10-80%, depending on the setting and type of program. Some researchers have reported on predictors of attrition, with the following being associated with high rates of dropout: (a) working full-time; (b) lack of obesity-related diseases; (c) positive mental health (i.e., lack of depressive symptomology); (d) poor diet or early dieting attempts; (e) low social support; and (f) poor initial treatment response (Colombo et al., 2014; Inelmen et al., 2004; Moroshko & Brennan, 2011). Moreover, it has been reported that intervention programs targeting parents only have higher dropout rates than parent-children intervention programs (Ewald, Kirby, Rees, & Robertson, 2013; Jang, Chao, & Whittemore, 2015; Jull & Chen, 2013). Although the current study included both parents and children, retention remained an obstacle. Given the program's many components (i.e., in-person follow-ups, questionnaires, nutrition and step tracking, health education webinars, and coaching) it is possible that some parents felt the

burden of participation was too high. To reduce participant burden, all coaching and/or education sessions were completed from the participant's home, questionnaires were available online, and follow-ups were conducted at parents' homes. Some parents reported enjoying this flexibility, whereas others (particularly those in the control group) requested more stringent scheduling and in-person guidance. In the future, researchers could conduct a needs assessment to determine the best way to engage and retain the target population in this region. Most parents were lost-to-follow-up, however, those who dropped out and gave a reason for doing so stated that they did not feel they had enough time to commit to the study or that other life stressors arose and they did not feel ready to participate. Lost-to-follow-up and dropout impacted the amount of quantitative data available, thus diminishing the generalizability of the findings. Future researchers might consider having fewer measures for data collection, or fewer data collection follow-up times.

The sample in the current study was homogeneous, with 94% (n = 47) of parent-participants being female. Researchers have suggested that mothers have been typically targeted in past research, given their high involvement in their children's lives; however, changes in societal roles have resulted in a shift toward fathers being more participatory in their children's lives (Lamb, 2012; Morgan et al., 2017). Targeting fathers in health research is important because of their influence on children's PA and nutrition behaviours – both of which are associated with the development of obesity (Morgan et al., 2017). Although mothers were not specifically targeted in the current research, interest and participation from fathers was not attained. Fathers who did participate did not complete all the follow-ups. Perhaps in the future, avenues to target fathers only could be considered – this might give researchers more information on the impact of fathers' participation in health-related behaviour change studies, as

well as their influence on the behaviours of their family unit. Alternatively, research programs that employ CALC for health behaviours in both parents, or the family as a whole, could be explored.

There were no statistically significant findings in the dependent variables over time. It is possible that the measures selected for this research were not adequate to observe statistically significant changes. For instance, while the aim of the TSRQ is to assess the degree of autonomous self-regulation (i.e., why people engage or would engage in a healthy behaviour), it does not comprehensively assess *all* forms of motivation (Levesque et al., 2007). Specifically, intrinsic motivation is rarely assessed in the TSRQ. Intrinsic motivation results from behaviours that are performed for the pleasure, interest, and satisfaction of engaging in them (Levesque et al., 2007). In the future, a questionnaire that encompasses all forms of motivation may provide a more comprehensive understanding of this population's motivation to engage (or not to engage) in health-promoting behaviours.

With regard to dietary intake, while researchers have reported that 24-hour recall is sufficient to characterize a population's average nutrient intake (Posner et al., 1992), it has been noted that 3-day food records allow researchers to understand day-to-day and seasonal variations in food consumption (Yang et al., 2010). Thus, to account for differences in food consumption on various days of the week, and gain a more comprehensive understanding of this population's dietary intake, future researchers may choose to employ the 3-day food record. Moreover, eating behaviour (e.g., restrained, emotional, external), and feeding strategies (e.g., restriction, pressure, reward) have been shown to affect the types of foods chosen for consumption (Elfhag, Tynelius, & Rasmussen, 2011; Olsen & Grunert, 2010). For instance, emotional and external eating have been linked to a higher consumption of sweets and soft drinks (Elfhag et al., 2011). Therefore, these behaviours and

practices would also be beneficial to explore in order to better understand dietary intake within the family unit.

Many participants in the current study shared that they would have preferred the webinars be offered in a different format (e.g. text message reminders or weekly messages). They explained that while it was convenient to be able to access the webinars online, they would have preferred them not be available all at once, or that tailored health-related messages were sent via text or email. The use of mobile applications, active video games, and text messages for program delivery in health behaviour interventions has demonstrated efficacy (e.g. increases in PA, improvements in dietary intake behaviours, improvements in psychosocial factors) in children (Quelly, Norris, & DiPietro, 2015), adolescents (Chen & Wilkosz, 2014) and adults (Bort-Roig, Gilson, Puig-Ribera, Contreras, & Trost, 2014). Thus, given that technology is widely used in today's society (Statistics Canada, 2011) perhaps future family-based health behaviour studies could integrate mobile applications (or something similar) to target behaviours in both parents and children. In addition, parents in the current study expressed that pedometers were cumbersome for themselves and their children. They explained that their children would either forget to wear their pedometers, or would lose them or leave them at school. Other studies have reported similar compliance issues with regard to children wearing pedometers (Oliver, Schofield, & Kolt, 2007). Parents in the current study, again, suggested the use of technology (i.e., mobile phones or wrist-worn fitness trackers) to track step count, or other devices that could be more easily worn. Other methods of PA tracking have been explored, and one research team found that the Fitbit Zip was a valid and reliable activity monitor for children's (Sharp, Mackintosh, Erjavec, Pascoe, & Horne, 2017) and healthy adults' (Tully, McBride, Heron, & Hunter, 2014) step counts, and it is a cheaper alternative to research-grade devices, such as

accelerometers. In addition, these devices can be placed inside a pocket, as opposed to worn on a waistband like pedometers. Another measure that may be of interest to explore is the use of wrist-worn fitness trackers to track step count and PA. Currently, new devices and brands of wrist-worn fitness trackers are released annually, and while this offers new opportunities for research, only a few well-established brands are currently used in research studies (e.g. Fitbit), and even fewer have been thoroughly validated (Henriksen et al., 2018).

Conclusions

A number of important conclusions can be drawn from a review of the included articles. Consistent with previous research, the present studies show that CALC is a convenient, innovative, and valuable support and behaviour change technique for individuals with obesity (Newnham-Kanas, Irwin, Morrow, & Battram, 2011; Newnham-Kanas, Morrow, & Irwin, 2011; Pearson, Irwin, Morrow, Battram, & Melling, 2013; van Zandvoort, Irwin, & Morrow, 2009). In addition, based on qualitative results, this research adds to the field in that it shows CALC can be effective for behaviour change in parents with overweight/obesity, their children, and their families as a whole.

It is important to note that the health education component of this study seemed to impact families in the control group more than the study team anticipated. This could be attributed to parents' high motivation to engage in healthy behaviours, as noted in both the TSRQ scores and qualitative findings. Some parents explained that learning how to read nutrition labels and about the negative impacts of prolonged bouts of sitting prompted them to change their habits. Although health education *was* influential, many parents in the control group expressed that they had hoped to receive coaching in order to work through their mindset and barriers, which in some cases, prevented them from making behaviour changes.

Coaches and parents in this study both described benefitting from their involvement. Overall, the tools/techniques coaches employed were positively received by parents. Parents appreciated not being pressured to focus on PA and nutrition behaviours, and enjoyed taking a collaborative role in addressing their behaviours. Coach-client perspectives provide important insights for future program design, in that they allow researchers to better understand expectations, successes, and areas for improvement in coach-client relationships.

To the researchers' knowledge this is the first study of its kind, utilizing CALC to address obesity in the family unit. In addition, it is also the first study to utilize a process-oriented approach to highlight themes that were the same or different at various time points. Employing an in-depth qualitative component revealed process-oriented changes, particularly when quantitative data did not provide robust results. CALC and/or health education were both described as effective methods to address obesity-promoting behaviours, with CALC providing participants with an avenue through which to meaningfully address their behaviours, and root causes of engaging in them. Through working with clients to address their context and behaviours as a whole, CALC offers a unique framework from which the development of future family-based obesity prevention and treatment programs could be designed.

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Appendix A

Ethics Approval

Western Research

Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Jennifer Irwin
Department & Institution: Health Sciences, Western University

NMREB File Number: 109219
Study Title: Coaching and/or Education for Parents with Obesity and their Preschoolers

NMREB Initial Approval Date: June 02, 2017
NMREB Expiry Date: June 02, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Other	Research Assistant Confidentiality Agreement	2017/04/03
Western University Protocol	Received May 27, 2017	
Instruments	Participant Eligibility Questionnaire	2017/05/14
Advertisement	CPCC Recruitment Poster	2017/05/14
Letter of Information & Consent	Participants	2017/05/14
Advertisement	Participant Poster	2017/05/14
Letter of Information & Consent	CPCC	2017/05/14
Other	Phone Script for Parents	2017/05/14
Recruitment Items	Recruitment Email	2017/05/14

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

[redacted]

Appendix B

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Appendix C

Copyright Information for International Journal of Evidence Based Coaching and Mentoring

Information available from: https://radar.brookes.ac.uk/radar/items/c27b82f2-1c2d-4e4e-bf3c-0f3f0fc61c33/1/#oa

Appendix D

Letter of Information for Parents/Guardians

Project Title: Coaching and/or Education for Parents with Obesity and their Preschoolers

Study Investigators:
Jennifer D. Irwin, PhD, Principal Investigator, Associate Professor, Faculty of Health Sciences, Western University

Shazya Karmali, PhD Student, Project Coordinator, Faculty of Health Sciences, Western University

Invitation to Participate

You are being invited to participate in this research study that aims to enhance health behaviours of adults with overweight/obesity and their preschoolers.

Background

Globally, 42 million young children (under the age of 5) and 2 billion adults are overweight or obese. Overweight and obesity are risk factors for many chronic diseases in both adults and children, and result in lower quality of life and shorter life spans. Children whose parents are overweight or obese are more likely to become overweight themselves. Interventions aimed at parent-child pairs are important for reducing obesity and promoting long-term healthy weights among members of the family unit. Further, parents are considered effective agents of change for their children and as such, including parents with overweight/obesity and their preschoolers (of any weight) in this intervention is important for potentially reducing obesity and promoting long-term healthy weights and lifestyle behaviors among members of the family unit.
This study aims to create a health promotion-based physical activity and nutrition intervention for parents and their preschoolers, using life coaching and health education sessions.

Purpose of this Research Study

The primary purpose of this research study is to gain an understanding of how 3 months of life coaching and/or health education sessions can enhance physical activity and dietary intake behaviours among parents with overweight/obesity and their preschoolers.

Who can participate?

In order for you and your child to participate in the study, you need to be a healthy adult with a body mass index (BMI) $\geq 25 kg/m^2$ (the researchers can assist with determining this), and your child must be between the ages of 2.5-5 years old. You and your child must live together for at least 5 days of the week. Additionally, you must be able to speak English fluently, and be comfortable using a computer.

What will happen if you choose to participate in this research study?

If you agree to participate, you will complete the following:
3-month Health Behaviour Program
A computer generated numbering sequence will place you in one of two groups, where you will receive either: 9 telephone-based life coaching sessions (3/month for 3 months) plus 6 online health education sessions (3 focused on physical activity and 3 based on nutrition), or the 6

online health education sessions alone. As a study participant, you will be asked to complete online questionnaires before beginning the program, 6 weeks into the program, immediately after receiving the sessions, and 6-months after the study. You will also be asked to track yours and your child's daily meals and 7-day step count (using a pedometer that we will supply) at these same time points. You will be assigned a unique study ID code to ensure responses are kept anonymous.

Questionnaires
You will be asked to complete a series of questionnaires that ask you about your health, self-esteem, and physical activity and nutrition behaviours. Some of these questionnaires indicate that you should answer all of the questions; however you may refuse to answer any of the questions at any time. Completion of these questionnaires will take place online and should take approximately 30 minutes each time. These will be administered prior to starting the program, 6 weeks into the program, immediately after the program, and at 6-months after the program. Your answers will be stored on a secure, password-protected server. The week before each assessment appointment, you will also be asked to record the foods you and your preschooler consumed over the course of 24 hours, and your and your preschoolers' step counts over the course of 7 days (using a pedometer provided by the research team).

Physical Assessments
Your body mass index (based on height and weight) and waist circumference will be measured at the beginning of the program, 6 weeks into the program, immediately after the program, and 6-months after the study. Measurements will take approximately 30 minutes to complete and will be completed at Western University.

One-Question Interviews
At the time of your physical assessments, the researcher will also ask you one question to get your feedback about the program. This interview will be recorded, on a voice recorder, and transcribed by the researcher. The files will be saved, on a password-protected computer, using your unique study ID code to ensure responses are kept anonymous.

Voluntary Participation
Participation in this study is entirely voluntary. You and/or your child may refuse to participate, refuse to answer any questions, or withdraw from the study at any time. If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know; your data can be removed up until the point of data analysis. You do not waive any legal rights by signing this consent form.

Cost and Compensation
There is no cost to participate in this study. You will be given a $60 grocery store card as a token of appreciation for participating in this study, and your Western University parking costs (associated with this project) will also be reimbursed.

Risks & Benefits
You may benefit from this program through the information and/or coaching provided to you,

and these sessions may help facilitate long-term health behaviour changes within your family unit. There are no known risks for participating in this study. Although it is not anticipated, it is possible that some individuals may feel sensitive speaking about their personal experiences. If you feel that you would like to share your feelings with individuals outside of the study environment, there are resources available in London and area (e.g. London Middlesex Counselling and Addiction Services).

Confidentiality

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Your participation in this study is completely confidential. Data collected from this study will only be accessible to the investigators and will be safeguarded on password-protected devices, which will be destroyed after 5 years. By participating in this research, you agree that your results may be used for scientific purposes, including publication in scientific and exercise & health specific journals. A master list will be maintained linking your name as a participant to an identifying number. Upon completion of the study, this list will be destroyed. The results of the study will be reported without identifying you personally, thus maintaining your confidentiality.

Contact persons (should you have any further questions about the study):

If you require any further information regarding this research project or your participation in the study, you may contact:

Dr. Jennifer D. Irwin, PhD
Principal Investigator
[redacted]

Shazya Karmali, MSc, PhD Student
PhD Student Investigator

If you have any questions about your rights as a research participant or the conduct of the study you may contact the Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca. Representatives of Western's Office of Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

This letter is for you to keep for future reference.

Coaching and/or Education for Parents with Obesity and their Preschoolers
Consent Form for Participants (Both Parents and Preschoolers)

Principal Investigator:
Dr. Jennifer Irwin
[redacted]

Additional Research Staff:

Shazya Karmali

[redacted]

[redacted]

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

_____	_____	_____
Print Name of Participant	Signature	*Date (DD-MM-YYYY)*

My signature means that I have explained the study to the participant named above. I have answered all questions.

_____	_____	_____
Print Name of Person Obtaining Consent	Signature	*Date (DD-MM-YYYY)*

I have read the Letter of Information, have had the nature of the study explained to me and I provide consent for my child to participate. All questions have been answered to my satisfaction.

Child's Name: _____
Parent / Legal Guardian / Substitute Decision Maker (Print): _____
Parent / Legal Guardian / Substitute Decision Maker (Sign): _____
Parent / Legal Guardian / Substitute Decision Maker (Date): _____

Appendix E

Letter of Information for Certified Professional Co-Active Coaches

Project Title: Coaching and/or Education for Parents with Obesity and their Young Children

Study Investigators:
Jennifer D. Irwin, PhD, Principal Investigator, Associate Professor, Faculty of Health Sciences, Western University

Shazya Karmali, PhD Student Investigator, Faculty of Health Sciences, Western University

Invitation to Participate

You are being invited to participate, as a coach, in this research study that aims to enhance the health behaviours of adults with overweight/obesity and their preschoolers.

Background

Globally, 42 million young children (under the age of 5) and 2 billion adults are overweight or obese. Overweight and obesity are risk factors for many chronic diseases in both adults and children, and result in lower quality and quantity of life. Children whose parents are overweight or obese are more likely to become overweight themselves. Parent-child interventions are important for reducing obesity and promoting long-term healthy weights among members of the family unit. Further, parents are considered effective agents of change for their children and as such, including parents with overweight/obesity and their preschoolers (of any weight) in this intervention is important for potentially reducing obesity and promoting long-term healthy weights and lifestyle behaviors among members of the family unit.

The method of Co-Active coaching has been grounded in several well-established behavioral theory frameworks (such as Social Cognitive Theory, the Theory of Reasoned Action, and the Theory of Planned Behavior), and has been evaluated as an effective short- and long-term obesity reduction approach in adult populations, including reductions in BMI and improvements in relevant psychosocial variables such as self-esteem and functional health status. An increasing number of studies have underscored the need to explore parent-focused or family-based childhood obesity prevention interventions. However, no studies have explored the utility of a coaching approach within a parent- or family-focused obesity reduction/healthy bodyweight promotion intervention aiming to impact both a parent and preschooler concurrently. The research has clearly outlined the value of coaching as an obesity reduction intervention, the necessity of incorporating parents in preschooler health interventions, and supporting parent-preschooler dyads is vital for sustained behavior change.

Purpose of this Research Study

The primary purpose of this research study is to gain an understanding of how 3 months of life coaching and/or health education sessions can enhance physical activity and dietary intake behaviours among parents with overweight/obesity and their preschoolers. The expected findings from this research will advance coaching literature, research, and practice on this topic by determining whether coaching and education is more effective than education alone at producing behavior changes among a family unit.

What does the study entail?
We are hoping to recruit 80 parent-child dyads, who will be randomly assigned to either the health education sessions (control) group or the Co-Active coaching and education sessions (intervention) group. Each parent-participant will receive 3 coaching sessions for 3 months. Thus, we are seeking CPCCs to work with 40 parents from the intervention group to deliver these coaching sessions via telephone, at a mutually agreed upon time (the education sessions will be implemented separately by the research team). As Co-Active coaching centers on placing the client as the expert of his/her life, the agenda will arise from the participant; however, it is anticipated that coaching sessions will be related to physical activity and dietary intake behaviour changes given that the participants have enrolled in a study aiming to address these behaviours.

Confidentiality
Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Your participation in this study is completely confidential. Data collected from this study will only be accessible to the investigators and will be safeguarded on password-protected devices, which will be destroyed after 5 years. By participating in this research, you agree that your results may be used for scientific purposes, including publication in scientific and exercise & health specific journals. A master list will be maintained linking your name as a coach to an identifying number. Upon completion of the study, this list will be destroyed. The results of the study will be reported without identifying you personally, thus maintaining your confidentiality.

Voluntary Participation
Participation in this study is entirely voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time. If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know; your data can be removed up until the point of data analysis. You do not waive any legal rights by signing this consent form.

Cost and Compensation
CPCCs will be offered a flat rate honorarium of approximately $700 per participant whose nine sessions they complete.

Contact persons (should you have any further questions about the study):

If you require any further information regarding this research project or your participation in the study, you may contact:

Dr. Jennifer D. Irwin, PhD
Principal Investigator
[redacted]

Shazya Karmali, MSc, PhD Student
Project Coordinator

If you have any questions about your rights as a research participant or the conduct of the study you may contact the Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca. Representatives of Western's Office of Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

This letter is for you to keep for future reference.

Confidentiality Agreement for Certified Professional Co-Active Coaches
Project Title: Coaching and/or Education for Parents with Obesity and their Preschoolers

Principal Investigator: Dr. Jennifer D. Irwin, PhD
[redacted]

I understand confidential information will be made known to me as (please check all that apply):
[ ] an interpreter
[ ] a transcriber
[ ] an audio assistant
[ ] a video assistant
[ ] a research assistant
[ ] other (please specify) _____
for a study being conducted by Professor Irwin of the Department of Health Studies, Western University. I agree to keep all information collected during this study confidential, and will not reveal by speaking, communicating or transmitting this information in written, electronic (disks, tapes, transcripts, email) or any other manner to anyone outside the research team.

Name of Assistant: _____ (please print)

Signature of Assistant: _____

Date: _____

Name of Principal Investigator: _____ (please print)

Signature of Principal Investigator: _____

Date: _____

Appendix F

Recruitment Poster for Parent-Child Dyads

Western

LOOKING FOR PARENT/GUARDIAN VOLUNTEERS FOR RESEARCH IN PARENT/CHILD OVERWEIGHT/OBESITY PREVENTION

Are you a (parent/guardian) volunteer looking to take part in a study to enhance healthy eating and physical activity behaviours of parent-preschooler pairs?
Do you meet the following criteria?

- You have a body mass index (BMI) $\geq 25 kg/m^2$ *(the researchers can help determine this)*
- You have a child between the ages of 2.5-5 years old, with whom you live at least 5 days of the week
- You are able to speak English fluently, and
- You are comfortable using a computer

If you meet the above criteria, are interested, and agree to participate you will have the opportunity to:

- Participate in 9 telephone-based life coaching sessions (approximately 20 minutes long, and can be completed from the comfort of your home); **and/or**
- Participate in 6 online health education sessions (approximately 30 minutes long; based on nutrition and physical activity); and,
- Complete a series of questionnaires, and body composition measurements at 3 time points.

In appreciation for your time, you will receive a $60 grocery store gift card, upon completion of this study, as well as reimbursement for any approved parking costs associated with this study.

For more information, or to participate in this study, please contact:

Dr. Jennifer D. Irwin, PhD
Principal Investigator
[redacted]

Shazya Karmali, MSc, PhD Student
PhD Student Investigator

Appendix G

Participant Demographics/Eligibility Questionnaire

Date: _____ Participant ID:

Birthdate (DD/MM/YY): _____ **Sex:** _____

For Researcher Use Only

BMI:

Waist Circumference:

Do you speak and write English proficiently?

- ☐ Yes
- ☐ No

Are you comfortable using a computer to fill out questionnaires for this study?

- ☐ Yes
- ☐ No

What is your racial background/ethnicity?

- ☐ Caucasian
- ☐ African Canadian
- ☐ Native/Aboriginal
- ☐ Arab
- ☐ Latin-American
- ☐ Asian
- ☐ Other (please specify): _____
- ☐ Prefer not to answer

Please circle/check your highest level of education <u>completed</u>.

- ☐ Elementary school (Grade school)
- ☐ Secondary school (High school)
- ☐ College
- ☐ University
- ☐ Graduate School
- ☐ Prefer not to answer

On average, how many minutes <u>per week</u> do you spend engaged in moderate-vigorous physical activity (e.g., brisk walking, jogging, bike riding, cross-country skiing, etc.)?

- ☐ Less than 30 minutes
- ☐ 30-59 minutes
- ☐ 60-89 minutes
- ☐ 90-119 minutes
- ☐ 120-149 minutes
- ☐ 150 minutes or more

What are typical items you and your family eat for each meal?

Breakfast: _____

Lunch: _____

Dinner: _____

Would you consider yourself healthy overall?

- ☐ Yes
- ☐ No

What is your family situation?

- ☐ Single-parent
- ☐ Double-parent
- ☐ Guardian-led
- ☐ Other: _____
- ☐ Prefer not to answer
- ☐

How many people live in your household (including yourself)?

- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

What is the approximate yearly income of your household?

- ☐ Less than $20,000
- ☐ $20,000 - $39,999
- ☐ $40,000 - $59,999
- ☐ $60,000 - $79,999
- ☐ $80,000 - $99,999
- ☐ $100,000-$119,999
- ☐ $120,000-$149,999
- ☐ More than $150,000

- ☐ Prefer not to answer

About Your Child

What is the sex of your child?

- ☐ Male
- ☐ Female

What is your child's date of birth? (DD/MM/YY)

_____

What is your child's racial background/ethnicity?

- ☐ Caucasian
- ☐ African Canadian
- ☐ Native/Aboriginal
- ☐ Arab
- ☐ Latin-American
- ☐ Asian
- ☐ Other (please specify): _____
- ☐ Prefer not to answer

In your opinion, how active is your child?

- ☐ Not at all active
- ☐ Somewhat active
- ☐ Very active
- ☐ Do not know

Is your child enrolled in extra-curricular sports/activities?

- ☐ Yes
- ☐ No

If YES, what kinds of sports/activities is your child enrolled in? (Please check all that apply)

- ☐ Soccer
- ☐ Hockey
- ☐ Skating
- ☐ Baseball/Softball
- ☐ Tennis/Badminton
- ☐ Basketball
- ☐ Gymnastics
- ☐ Volleyball
- ☐ Dance
- ☐ Swimming
- ☐ Karate
- ☐ Other (please specify):

If YES, how many hours <u>per week</u> does your child spend in these extra-curricular sports/activities?

- ☐ Less than 2 hours
- ☐ Between 2-5 hours
- ☐ More than 5 hours

Appendix H

Letter of Information for Certified Professional Co-Active Coaches Interview

Project Title: Coaching and/or Education for Parents with Obesity and their Young Children

Study Investigators:
Jennifer D. Irwin, PhD, Principal Investigator, Associate Professor, Faculty of Health Sciences, Western University

Shazya Karmali, PhD Student Investigator, Faculty of Health Sciences, Western University

Invitation to Participate

You are being invited to participate, as a coach, in this research study that aims to enhance the health behaviours of adults with overweight/obesity and their preschoolers.

Background

Globally, 42 million young children (under the age of 5) and 2 billion adults are overweight or obese. Overweight and obesity are risk factors for many chronic diseases in both adults and children, and result in lower quality and quantity of life. Children whose parents are overweight or obese are more likely to become overweight themselves. Parent-child interventions are important for reducing obesity and promoting long-term healthy weights among members of the family unit. Further, parents are considered effective agents of change for their children and as such, including parents with overweight/obesity and their preschoolers (of any weight) in this intervention is important for potentially reducing obesity and promoting long-term healthy weights and lifestyle behaviors among members of the family unit.

The method of Co-Active coaching has been grounded in several well-established behavioral theory frameworks (such as Social Cognitive Theory, the Theory of Reasoned Action, and the Theory of Planned Behavior), and has been evaluated as an effective short- and long-term obesity reduction approach in adult populations, including reductions in BMI and improvements in relevant psychosocial variables such as self-esteem and functional health status. An increasing number of studies have underscored the need to explore parent-focused or family-based childhood obesity prevention interventions. However, no studies have explored the utility of a coaching approach within a parent- or family-focused obesity reduction/healthy bodyweight promotion intervention aiming to impact both a parent and preschooler concurrently. The research has clearly outlined the value of coaching as an obesity reduction intervention, the necessity of incorporating parents in preschooler health interventions, and supporting parent-preschooler dyads is vital for sustained behavior change.

Purpose of this Research Study

The primary purpose of this research study is to gain an understanding of how 3 months of life coaching and/or health education sessions can enhance physical activity and dietary intake behaviours among parents with overweight/obesity and their preschoolers. The expected findings from this research will advance coaching literature, research, and practice on this topic by determining whether coaching and education is more effective than education alone at producing behavior changes among a family unit.

What does the interview for this study entail?
We are hoping to assess coaches' perspectives regarding their experiences with our study. If you choose to participate in this aspect of the study, we will conduct a short audio-recorded, telephone-based interview upon completion of your participation in this study. Your responses will be kept confidential and de-identified (in that, your names will not be included in study findings). We may choose to quote you when disseminating our findings, however quotes will also be de-identified. Given that Co-Active coaching is confidential between coach and client, we will not be asking about specific participant experiences, but instead about your experience with our program.

Confidentiality
Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Your participation in this study is completely confidential. Data collected from this study will only be accessible to the investigators and will be safeguarded on password-protected devices, which will be destroyed after 5 years. By participating in this research, you agree that your results may be used for scientific purposes, including publication in scientific and exercise & health specific journals. A master list will be maintained linking your name as a coach to an identifying number. Upon completion of the study, this list will be destroyed. The results of the study will be reported without identifying you personally, thus maintaining your confidentiality.

Voluntary Participation
Participation in this study is entirely voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time. If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know; your data can be removed up until the point of data analysis. You do not waive any legal rights by signing this consent form.

Cost and Compensation
There will be no additional compensation for this interview.

Contact persons (should you have any further questions about the study):

If you require any further information regarding this research project or your participation in the study, you may contact:

Dr. Jennifer D. Irwin, PhD
Principal Investigator
[redacted]

Shazya Karmali, MSc, PhD Student
Project Coordinator

If you have any questions about your rights as a research participant or the conduct of the study you may contact the Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca.

Representatives of Western's Office of Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

This letter is for you to keep for future reference.

Coaching and/or Education for Parents with Obesity and their Children (Ages 2.5-10)
Consent Form for CPCCs

Principal Investigator:
Dr. Jennifer Irwin
[redacted]

Additional Research Staff:

[redacted]

I agree to be audio-recorded for this research:

☐ Yes

☐ No

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research.

☐ Yes

☐ No

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

_____	_____	_____
Print Name of CPCC	Signature	*Date (DD-MM-YYYY)*

My signature means that I have explained the study to the participant named above. I have answered all questions.

_____	_____	_____
Print Name of Person Obtaining Consent	Signature	*Date (DD-MM-YYYY)*

Appendix I

E-mail to Certified Professional Co-Active Coaches

Dear Coaches,

Thank you for your participation in our study, and for your continued support of our project and participants. We are hoping to assess coaches' perspectives and experiences with our study, and as such, would like to ask whether you would be interested in participating in an audio-recorded, phone-based interview, which should take approximately 20 minutes. If so, please provide me with a few dates/times that work well for you. Please note that your honorarium and participation will not be impacted in any way, if you choose to decline participation in this part of the study. All your responses will be kept confidential. Audio files will be stored on a password-locked computer, and transcribed (without use of names).

With thanks and kind regards,

Shazya Karmali & Dr. Jennifer Irwin

Appendix J

Social Media and Radio Recruitment

Radio Advertisement Script

"Are you finding it challenging to eat healthy and engage in enough physical activity? Do you want to learn how you can improve your and your family's health? If you struggle with your weight, and have a child who is between the ages of 2.5 - 10, you both may be eligible to participate in a voluntary parent-child study at Western University, where you will have the opportunity to receive phone-based coaching and/or online education sessions focused on nutrition and physical activity. For more information please contact Dr. Jennifer Irwin's study team at [redacted]

Social Media Posts

Research opportunity to enhance physical activity & nutrition habits for parents with overweight/obesity and their young children! Your participation is voluntary. For more info see attached poster & contact researchers: [redacted]

Appendix K

Step Count

Available in Qualtrics for Participants

Please enter your STUDY ID number: _____

Please record **your** step count from the past 7 days, as noted on your pedometer:

Day 1 ___

Day 2 ___

Day 3 ___

Day 4 ___

Day 5 ___

Day 6 ___

Day 7 ___

Please record **your child's** step count from the past 7 days, as noted on their pedometer:

Day 1 ___

Day 2 ___

Day 3 ___

Day 4 ___

Day 5 ___

Day 6 ___

Day 7 ___

Appendix L

24-Hour Food Recall

Available in Qualtrics for Participants

Please enter your STUDY ID number: ____

List everything **you** ate and drank yesterday. Include **ALL** meals, beverages (including alcohol), and snacks. If possible, indicate how the food was prepared (e.g., fried, baked, grilled, etc.), whether it was fresh, frozen, or canned, and the brand name. **Please be specific regarding portions and sizes.**

Example:
Breakfast: 1 cup bran cereal, 1/2 cup 1% milk
1 slice whole wheat toast with butter (1 tsp.)
1 cup coffee (1 tbsp. 1% milk and 1 tsp. sugar)

Breakfast:

Lunch:

Snacks:

Dinner:

Notes:

Now, please list everything **your child** ate and drank yesterday. Include **ALL** meals, beverages, and snacks. If possible, indicate how the food was prepared (e.g., fried, baked, grilled, etc.), whether it was fresh, frozen, or canned, and the brand name. **Please be specific regarding portions and sizes.**

Breakfast:

Lunch:

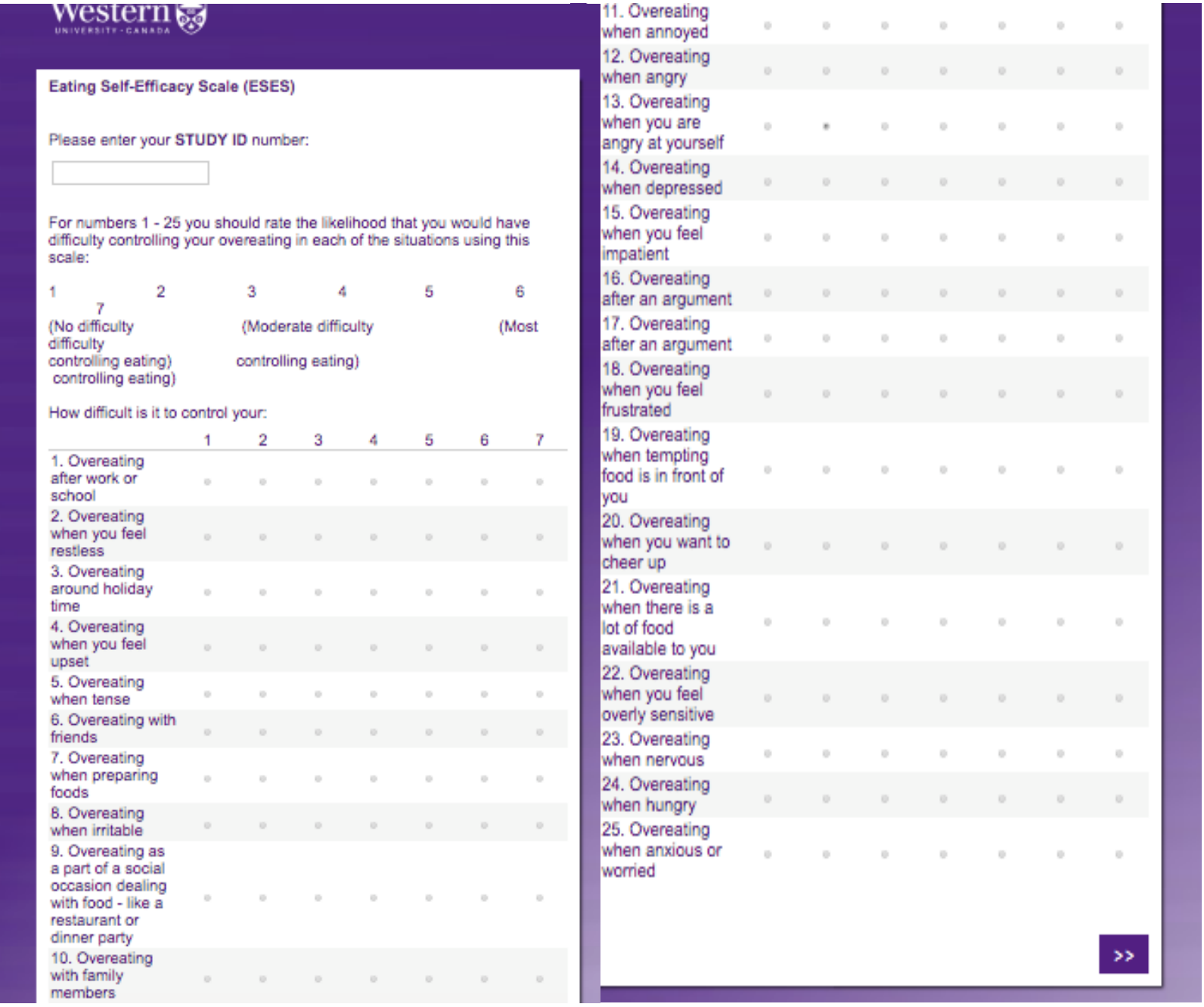
Snacks:

Dinner:

Notes:

Appendix M

Eating Self-Efficacy Scale



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Eating Self-Efficacy Scale (ESES)

Please enter your **STUDY ID** number:

For numbers 1 - 25 you should rate the likelihood that you would have difficulty controlling your overeating in each of the situations using this scale:

1 (No difficulty controlling eating) 2 3 4 (Moderate difficulty controlling eating) 5 6 7 (Most difficulty controlling eating)

How difficult is it to control your:

	1	2	3	4	5	6	7
1. Overeating after work or school							
2. Overeating when you feel restless							
3. Overeating around holiday time							
4. Overeating when you feel upset							
5. Overeating when tense							
6. Overeating with friends							
7. Overeating when preparing foods							
8. Overeating when irritable							
9. Overeating as a part of a social occasion dealing with food - like a restaurant or dinner party							
10. Overeating with family members							
11. Overeating when annoyed							
12. Overeating when angry							
13. Overeating when you are angry at yourself							
14. Overeating when depressed							
15. Overeating when you feel impatient							
16. Overeating after an argument							
17. Overeating after an argument							
18. Overeating when you feel frustrated							
19. Overeating when tempting food is in front of you							
20. Overeating when you want to cheer up							
21. Overeating when there is a lot of food available to you							
22. Overeating when you feel overly sensitive							
23. Overeating when nervous							
24. Overeating when hungry							
25. Overeating when anxious or worried							

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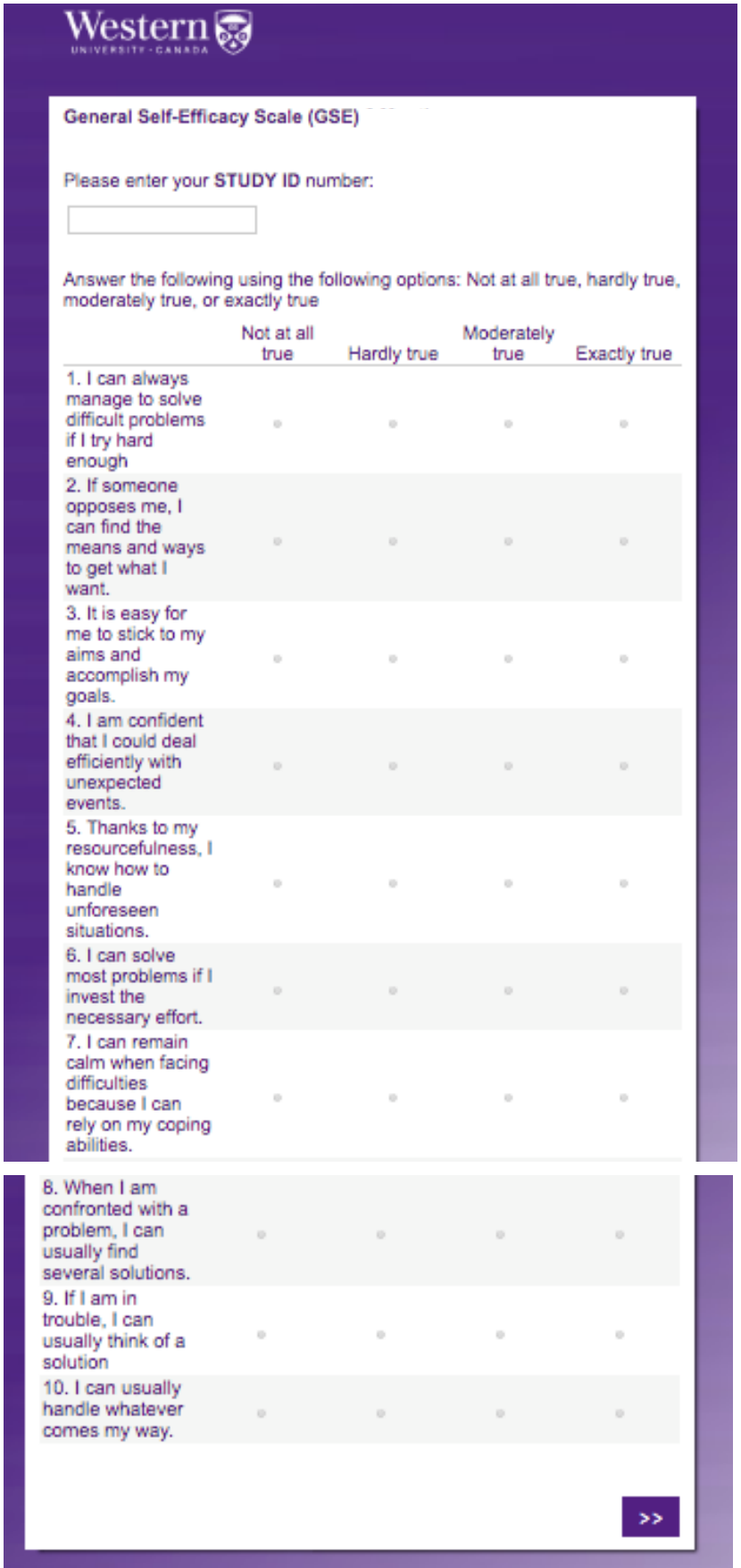
Appendix N

Generalized Self-Efficacy Scale



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General Self-Efficacy Scale (GSE)

Please enter your **STUDY ID** number:

Answer the following using the following options: Not at all true, hardly true, moderately true, or exactly true

	Not at all true	Hardly true	Moderately true	Exactly true
1. I can always manage to solve difficult problems if I try hard enough	○	○	○	○
2. If someone opposes me, I can find the means and ways to get what I want.	○	○	○	○
3. It is easy for me to stick to my aims and accomplish my goals.	○	○	○	○
4. I am confident that I could deal efficiently with unexpected events.	○	○	○	○
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	○	○	○	○
6. I can solve most problems if I invest the necessary effort.	○	○	○	○
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	○	○	○	○
8. When I am confronted with a problem, I can usually find several solutions.	○	○	○	○
9. If I am in trouble, I can usually think of a solution	○	○	○	○
10. I can usually handle whatever comes my way.	○	○	○	○

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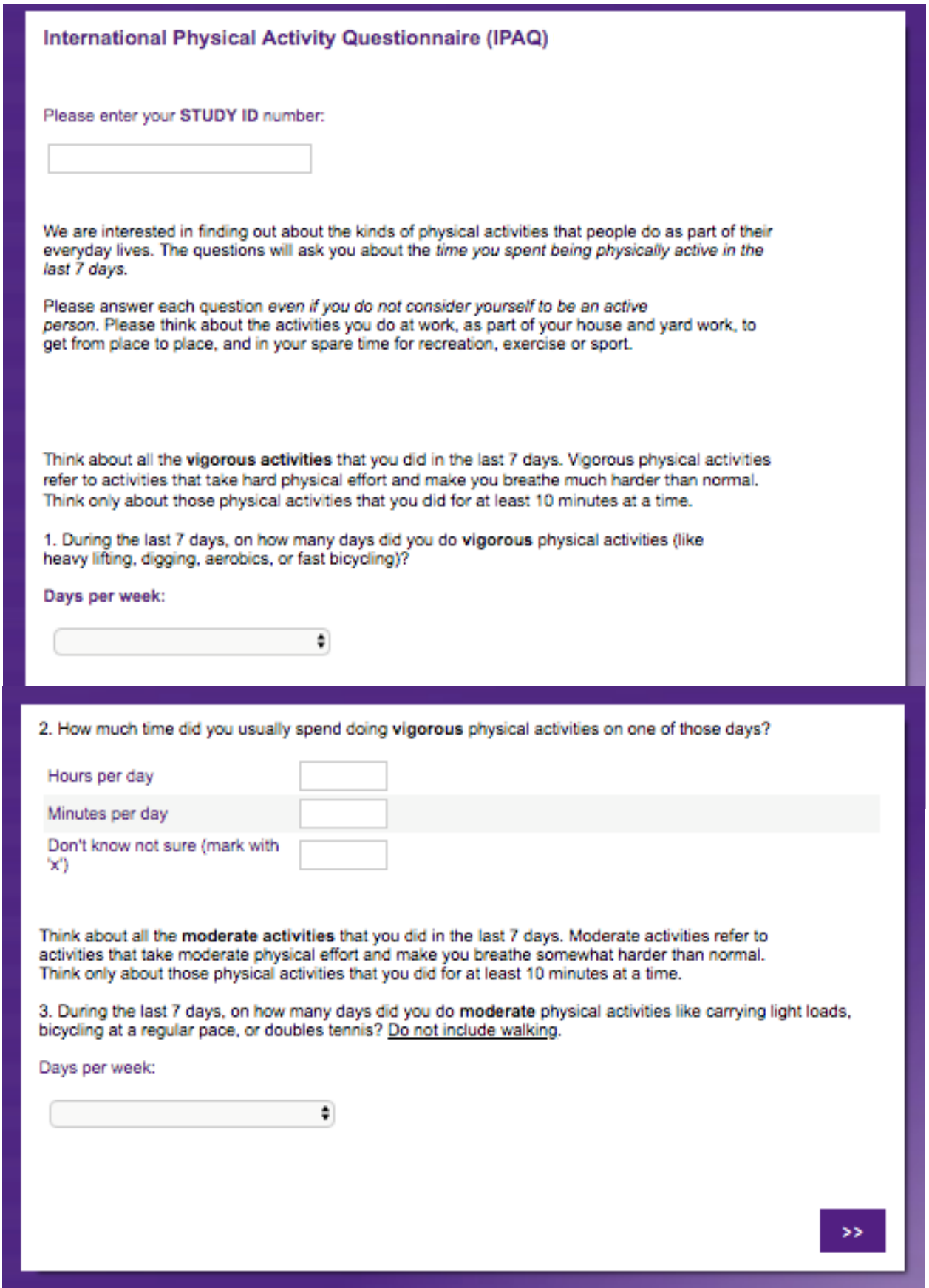
Appendix O

International Physical Activity Questionnaire



International Physical Activity Questionnaire (IPAQ)

Please enter your **STUDY ID** number:

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the *time you spent being physically active in the last 7 days.*

Please answer each question *even if you do not consider yourself to be an active person*. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous activities** that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do **vigorous** physical activities (like heavy lifting, digging, aerobics, or fast bicycling)?

Days per week:

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

Hours per day	
Minutes per day	
Don't know not sure (mark with 'x')	

Think about all the **moderate activities** that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

Days per week:

>>

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

Hours per day	
Minutes per day	
Don't know/not sure (mark with 'x')	

Think about the time you spent **walking** in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you **walk** for at least **10 minutes** at a time?

Days per week:

>>

6. How much time did you usually spend **walking** on one of those days?

Hours per day	
Minutes per day	
Don't know/not sure (mark with 'x')	

The last question is about the time you spent **sitting** on **weekdays** during the last 7 days. Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend **sitting** on a weekday?

Hours per day	
Minutes per day	
Don't know/not sure (mark with 'x')	

>>

Appendix P

Multi-Dimensional Scale of Perceived Social Support

Please enter your **STUDY ID** number:

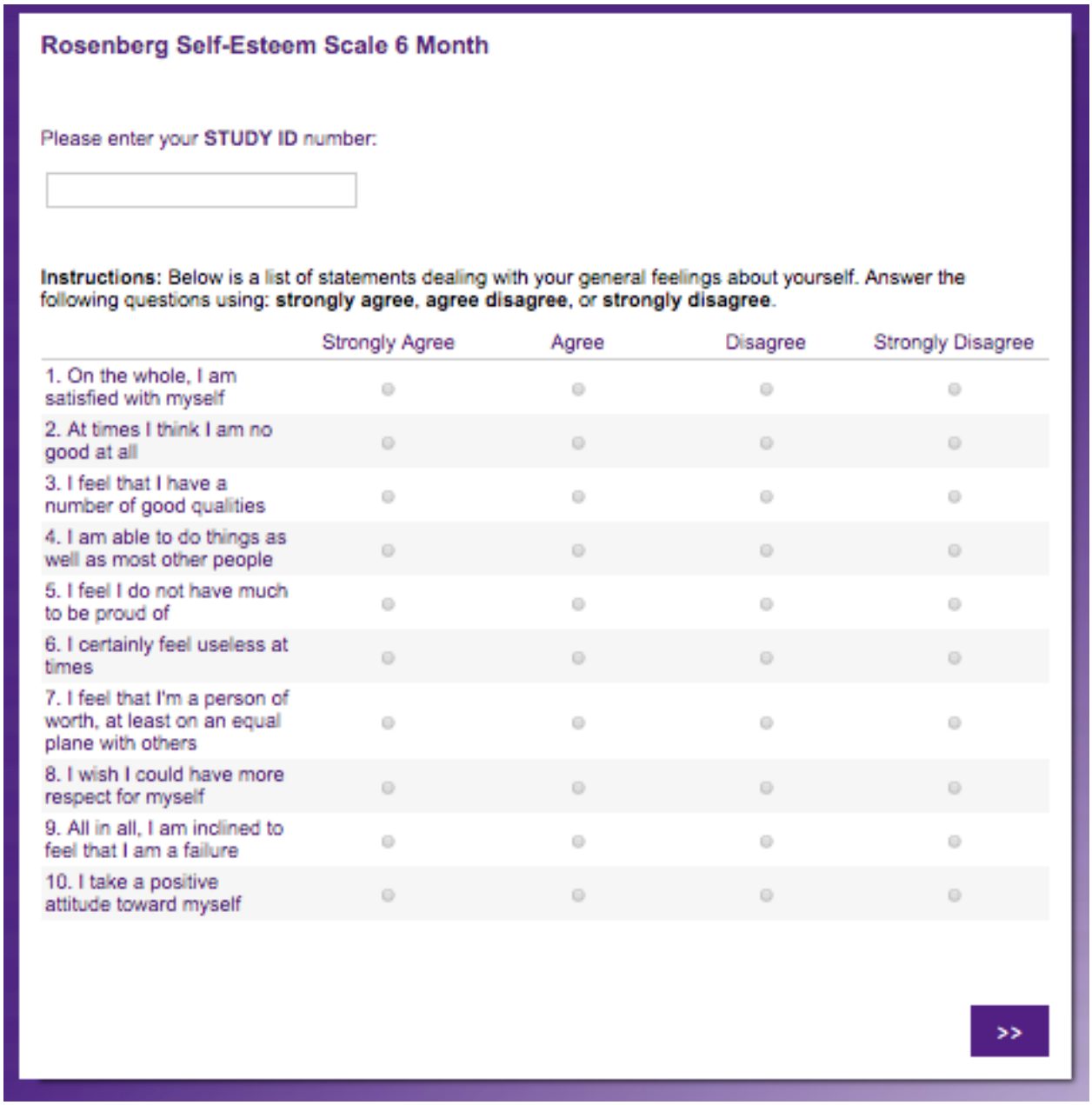
Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select "1" if you **Very Strongly Disagree**
Select "2" if you **Strongly Disagree**
Select "3" if you **Mildly Disagree**
Select "4" if you are **Neutral**
Select "5" if you **Mildly Agree**
Select "6" if you **Strongly Agree**
Select "7" if you **Very Strongly Agree**

	1 (Very Strongly Disagree)	2 (Strongly disagree)	3 (Mildly Disagree)	4 (Neutral)	5 (Mildly Agree)	6 (Strongly Agree)	7 (Very Strongly Agree)
1. There is a special person who is around when I am in need.							
2. There is a special person with whom I can share my joys and sorrows.							
3. My family really tries to help me.							
4. I get the emotional help and support I need from my family.							
5. I have a special person who is a real source of comfort to me.							
6. My friends really try to help me.							
7. I can count on my friends when things go wrong.							
8. I can talk about my problems with my family.							
9. I have friends with whom I can share my joys and sorrows							
10. There is a special person in my life who cares about my feelings.							
11. My family is willing to help me make decisions.							
12. I can talk about my problems with my friends.							

Appendix Q

Rosenberg Self-Esteem Scale



Rosenberg Self-Esteem Scale 6 Month

Please enter your **STUDY ID** number:

Instructions: Below is a list of statements dealing with your general feelings about yourself. Answer the following questions using: **strongly agree**, **agree disagree**, or **strongly disagree**.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself				
2. At times I think I am no good at all				
3. I feel that I have a number of good qualities				
4. I am able to do things as well as most other people				
5. I feel I do not have much to be proud of				
6. I certainly feel useless at times				
7. I feel that I'm a person of worth, at least on an equal plane with others				
8. I wish I could have more respect for myself				
9. All in all, I am inclined to feel that I am a failure				
10. I take a positive attitude toward myself				

>>

Appendix R

Self-Efficacy Scales for Overcoming Barriers

Self-Efficacy Scales for Overcoming Barriers 6 Month

Please enter your **STUDY ID** number:

Overcoming Barriers to Nutrition

Please indicate below how confident you are that you can successfully carry out each of the activities listed below using the following scale.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
No Confidence at All					Somewhat Confident				Completely Confident	

How certain are you that you could overcome the following barriers?

I can manage to stick to eating a well-balanced diet with predominately healthful foods, and reduced junk food...
(Please type in percentage using scale provided above as a reference)

1. ... even if I need a long time to develop necessary the routines	
2. ... even if I have to try several times until it works	
3. ...even if I have to rethink my entire way of nutrition	
4. ... even if I do not receive a great deal of support from others when making my first attempts	
5. ... even if I have to make a detailed plan	
6. ... even if I am travelling	
7. ... even if it means bringing my meal to work	
8. ... even if I am eating at a restaurant	
9. ... even if I am going to a friend's house for a meal	
10. ... even if the healthful meal is more expensive	
11. ... even if junk food is more available than healthful food	

Overcoming Barriers to Physical Activity

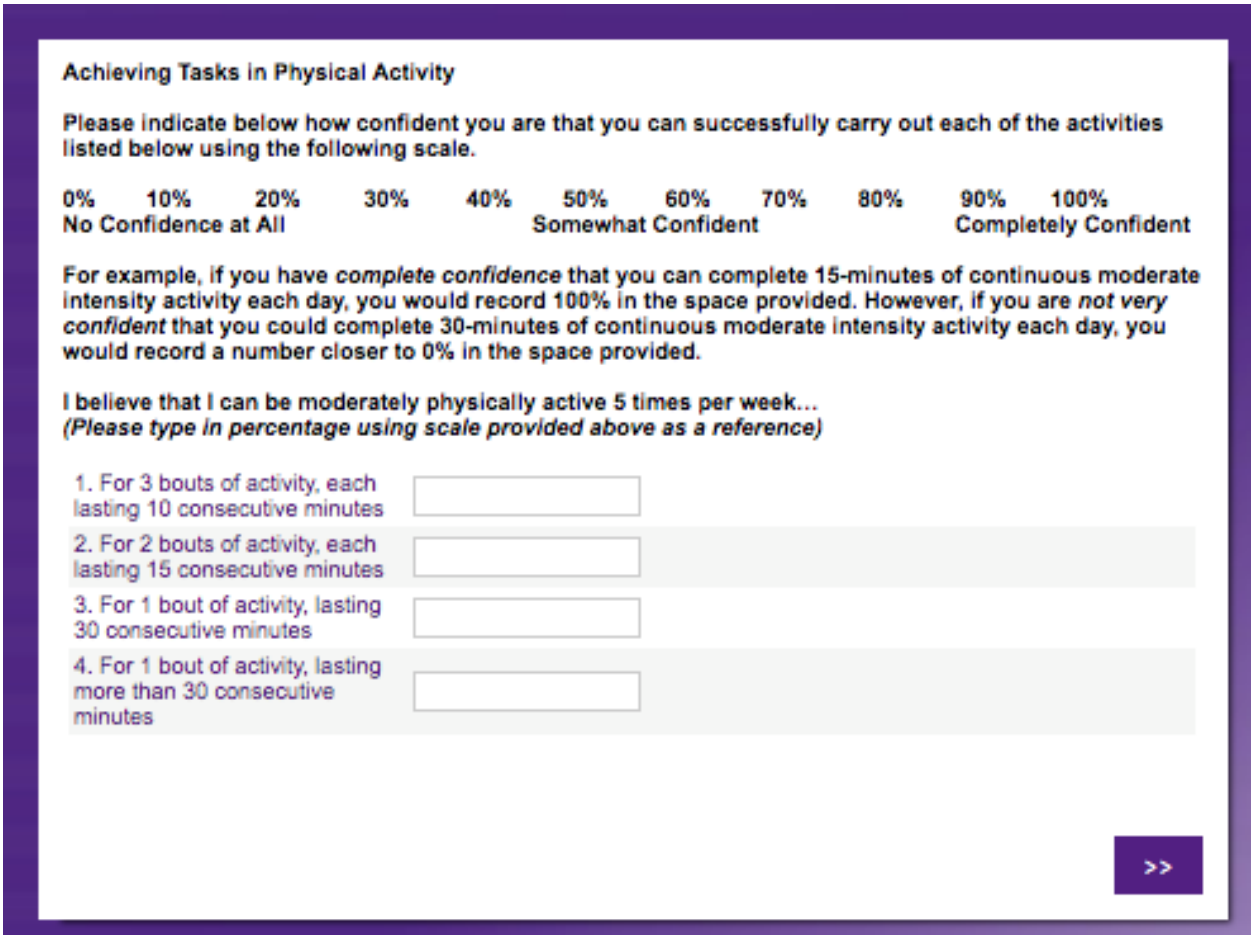
The items below reflect common reasons preventing people from participating in physical activity programs or, in some cases, dropping out or quitting the program altogether. Using the scale below, please indicate how confident you are that you could be physically active in the event that any of the following circumstances were to occur.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
No Confidence at All — Somewhat Confident — Completely Confident

For example, if you have *complete confidence* that you can continue to be physically active, even if you are bored by the activity, you would record 100% in the space provided. However, if you are absolutely sure that you *could not* be physically active if you failed to make, or continue to make progress, you would record 0% in the space provided.

I believe that I can be moderately physically active 5 times per week if:
(Please type in percentage using scale provided above as a reference)

1. The weather is very bad (hot, humid, rainy, snow, cold)	
2. I was bored by the program or activity	
3. I was on vacation	
4. I felt pain or discomfort when being active	
5. I had to be active alone	
6. Physical activity was not enjoyable or fun	
7. It became difficult to get to the activity location	
8. I didn't like the particular activity program I was doing	
9. My work schedule conflicted with my activity program	
10. I felt self-conscious about my appearance when active	
11. The class instructor did not offer me any encouragement	
12. I was under personal stress of some kind	



Achieving Tasks in Physical Activity

Please indicate below how confident you are that you can successfully carry out each of the activities listed below using the following scale.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
No Confidence at All — Somewhat Confident — Completely Confident

For example, if you have *complete confidence* that you can complete 15-minutes of continuous moderate intensity activity each day, you would record 100% in the space provided. However, if you are *not very confident* that you could complete 30-minutes of continuous moderate intensity activity each day, you would record a number closer to 0% in the space provided.

I believe that I can be moderately physically active 5 times per week...
(Please type in percentage using scale provided above as a reference)

1. For 3 bouts of activity, each lasting 10 consecutive minutes	
2. For 2 bouts of activity, each lasting 15 consecutive minutes	
3. For 1 bout of activity, lasting 30 consecutive minutes	
4. For 1 bout of activity, lasting more than 30 consecutive minutes	

>>

Appendix S

Short Form-36

Short Form 36 (SF-36)

Please enter your **STUDY ID** number:

1. In general, would you say your health is:

- Excellent
- Very good
- Good
- Fair
- Poor

2. Compared to one year ago, how would you rate your health in general now?

- Much better now than one year ago
- Somewhat better now than one year ago
- About the same
- Somewhat worse now than one year ago
- Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now **limit** you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports			
4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf			
5. Lifting or carrying groceries			
6. Climbing several flights of stairs			
7. Climbing one flight of stairs			
8. Bending, neeling, or stooping			
9. Walking more than a mile			
10. Walking several blocks			

11. Walking one block	○	○	○
12. Bathing or dressing yourself	○	○	○

During the past **4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of your **physical** health?

	Yes	No
13. Cut down the **amount of time** you spent on work or other activities	○	○
14. **Accomplished less** than you would like	○	○
15. Were limited in the **kind** of work or other activities	○	○
16. Had **difficulty** performing the work or other activities (for example, it took extra effort)	○	○

During the past **4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of any **emotional** problems (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities	○	○
18. **Accomplished less** than you would like	○	○
19. Didn't do work or other activities as **carefully** as usual	○	○

20. During the past **4 weeks**, to what extent has your **physical** health or **emotional** problems **interfered with your normal social activities** with family, friends, neighbors, or groups?

- ○ Not at all
- ○ Slightly
- ○ Moderately
- ○ Quite a bit
- ○ Extremely

21. How much **bodily pain** have you had during the past **4 weeks**?

- None
- Very mild
- Mild
- Moderate
- Severe
- Very severe

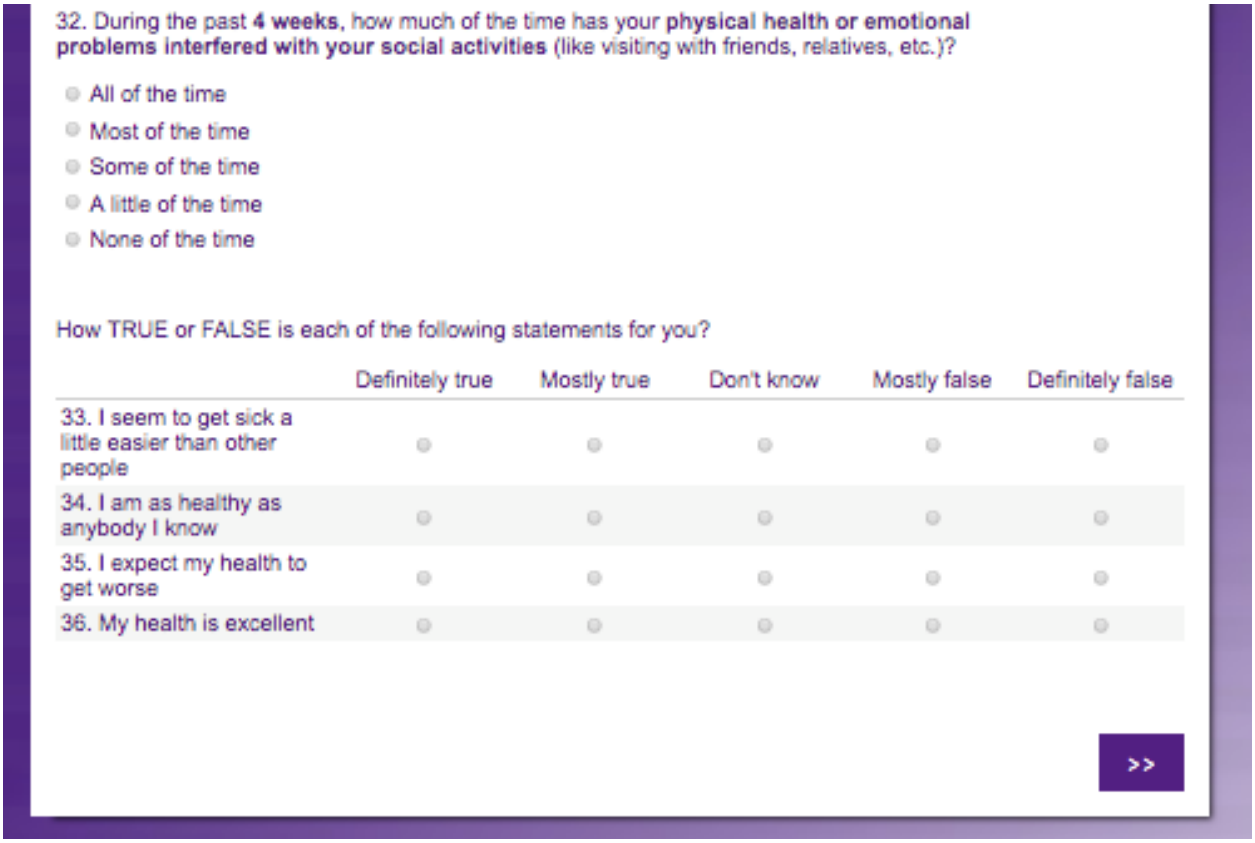
22. During the past **4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

These questions are about how you feel and how things have been with you during the past **4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?						
24. Have you been a very nervous person?						
25. Have you felt so down in the dumps that nothing could cheer you up?						
26. Felt calm and peaceful?						
27. Did you have a lot of energy?						
28. Have you felt downhearted and blue?						
29. Did you feel worn out?						
30. Have you been a happy person?						
31. Did you feel tired?						



32. During the past **4 weeks**, how much of the time has your **physical health or emotional problems interfered with your social activities** (like visiting with friends, relatives, etc.)?

- All of the time
- Most of the time
- Some of the time
- A little of the time
- None of the time

How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people					
34. I am as healthy as anybody I know					
35. I expect my health to get worse					
36. My health is excellent					

>>

Appendix T

Treatment Self-Regulation Questionnaire (Diet & Exercise)

The following question relates to the reasons why you would either start eating a healthier diet or continue to do so. Different people have different reasons for doing that, and we want to know how true each of the following reasons is for you. All 15 responses are to the same question.

Please indicate the extent to which each reason is true for you, using the following 7-point scale:

1 not at all true 2 3 4 somewhat true 5 6 7 very true

The reason I would *eat a healthy diet* is:

	1 (not at all true)	2	3	4 (somewhat true)	5	6	7 (very true)
1. Because I feel that I want to take responsibility for my own health	○	○	○	○	○	○	○
2. Because I would feel guilty or ashamed of myself if I did not eat a healthy diet	○	○	○	○	○	○	○
3. Because I personally believe it is the best thing for my health	○	○	○	○	○	○	○
4. Because others would be upset with me if I did not	○	○	○	○	○	○	○
5. I really don't think about it	○	○	○	○	○	○	○
6. Because I have carefully thought about it and believe it is very important for many aspects of my life	○	○	○	○	○	○	○
7. Because I would feel bad about myself if I did not eat a healthy diet	○	○	○	○	○	○	○
8. Because it is an important choice I really want to make	○	○	○	○	○	○	○
9. Because I feel pressure from others to do so	○	○	○	○	○	○	○
10. Because it is easier to do what I am told than think about it	○	○	○	○	○	○	○
11. Because it is consistent with my life goals	○	○	○	○	○	○	○
12. Because I want others to approve of me	○	○	○	○	○	○	○
13. Because it is very important for being as healthy as possible	○	○	○	○	○	○	○
14. Because I want others to see I can do it	○	○	○	○	○	○	○
15. I don't really know why	○	○	○	○	○	○	○

The following question relates to the reasons why you would either start to exercise regularly or continue to do so. Different people have different reasons for doing that, and we want to know how true each of the following reasons is for you. All 15 responses are to the one question.

Please indicate the extent to which each reason is true for you, using the following 7-point scale:

1 not at all true 2 3 4 somewhat true 5 6 7 very true

The reason I would *exercise regularly* is:

	1 (not at all true)	2	3	4 (somewhat true)	5	6	7 (very true)
1. Because I feel that I want to take responsibility for my own health	○	○	○	○	○	○	○
2. Because I would feel guilty or ashamed of myself if I did not exercise regularly	○	○	○	○	○	○	○
3. Because I personally believe it is the best thing for my health	○	○	○	○	○	○	○
4. Because others would be upset with me if I did not	○	○	○	○	○	○	○
5. I really don't think about it	○	○	○	○	○	○	○
6. Because I have carefully thought about it and believe it is very important for many aspects of my life	○	○	○	○	○	○	○
7. Because I would feel bad about myself if I did not exercise regularly	○	○	○	○	○	○	○
8. Because it is an important choice I really want to make	○	○	○	○	○	○	○
9. Because I feel pressure from others to do so	○	○	○	○	○	○	○
10. Because it is easier to do what I am told than think about it	○	○	○	○	○	○	○
11. Because it is consistent with my life goals	○	○	○	○	○	○	○
12. Because I want others to approve of me	○	○	○	○	○	○	○
13. Because it is very important for being as healthy as possible	○	○	○	○	○	○	○
14. Because I want others to see I can do it	○	○	○	○	○	○	○
15. I don't really know why	○	○	○	○	○	○	○

Appendix U

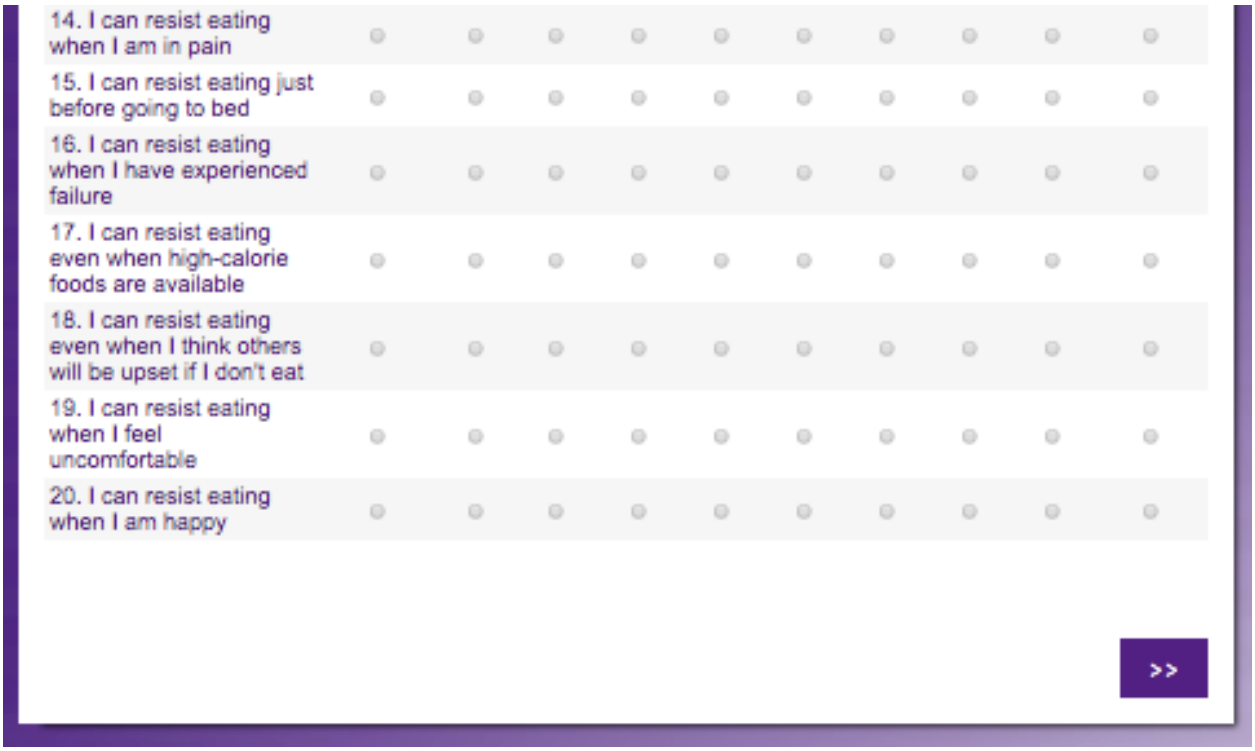
Weight Efficacy Lifestyle Questionnaire

Weight Efficacy Lifestyle Questionnaire

Please enter your **STUDY ID** number:

Read each situation below and decide how confident (or certain) you are that you will be able to **resist** overeating in each of the difficult situations. On a scale of **0** ***(not confident at all that I can resist the desire to eat)*** to **9** ***(very confident that I can resist the desire to eat)***, choose ONE number that reflects how confident you feel now about being able to successfully resist the desire to overeat.

	0 (Not at all confident)	1	2	3	4	5	6	7	8	9 (very confident)
1. I can resist eating when I am anxious (or nervous)	○	○	○	○	○	○	○	○	○	○
2. I can control my eating on the weekends	○	○	○	○	○	○	○	○	○	○
3. I can resist eating even when I have to say "no" to others	○	○	○	○	○	○	○	○	○	○
4. I can resist eating when I feel physically run down	○	○	○	○	○	○	○	○	○	○
5. I can resist eating when I am watching TV	○	○	○	○	○	○	○	○	○	○
6. I can resist eating when I am depressed (or down)	○	○	○	○	○	○	●	○	○	○
7. I can resist eating when there are many different kinds of foods available	○	○	○	○	○	○	○	○	○	○
8. I can resist eating even when I feel it's impolite to refuse a second helping	○	○	○	○	○	○	○	○	○	○
9. I can resist eating even when I have a headache	○	○	○	○	○	○	○	○	○	○
10. I can resist eating when I am reading	○	○	○	○	○	○	○	○	○	○
11. I can resist eating when I am angry (or irritable)	○	○	○	○	○	○	○	○	○	○
12. I can resist eating even when I am at a party	○	○	○	○	○	○	○	○	○	○
13. I can resist eating even when others are pressuring me to eat	○	○	○	○	○	○	○	○	○	○


14. I can resist eating when I am in pain
15. I can resist eating just before going to bed
16. I can resist eating when I have experienced failure
17. I can resist eating even when high-calorie foods are available
18. I can resist eating even when I think others will be upset if I don't eat
19. I can resist eating when I feel uncomfortable
20. I can resist eating when I am happy
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Curriculum Vitae

SHAZYA KARMALI

ACADEMIC INFORMATION

PhD Candidate, Health and Rehabilitation Sciences (Health Promotion)
Anticipated: December 2019 Supervisor: Dr. Jennifer D. Irwin, Western University, London, ON
Doctoral research focus: Enhancing physical activity and nutrition behaviours among parents with overweight/obesity and their children (ages 2.5-10, of any weight), via a coaching and/or education intervention, with the long-term goal of preventing obesity within the family unit.

Master of Science (Health: Science, Technology, and Policy)
April 2015
Carleton University, Ottawa, ON
Master's thesis focus: Assessing and evaluating available supports, and gaps in support, for informal caregivers in the Almonte, Ontario area.

Bachelor of Health Sciences (Specialization in Health Studies)
April 2012
Western University, London, ON

PUBLICATIONS

Fried, R. R., **Karmali, S**., & Irwin, J. D. (Submitted July 3, 2019). Minding many minds: An assessment of mental health and resilience among undergraduate and graduate students; A mixed methods exploratory study. *Journal of American College Health*. Under review.

Karmali, S., Ng, V., Battram, D., Burke, S., Morrow, D., Pearson, E., Tucker, P., Mantler, T., Cramp, A., Petrella, R., & Irwin, J. D. (2019). Coaching and/or education intervention for parents with overweight/obesity and their children: Study protocol of a single-centre randomized controlled trial. *BMC Public Health*, *19*(345), 1-12. https://doi.org/10.1186/s12889-019-6640-5

Fried, R. R., **Karmali, S**., Irwin, J. D., Gable, F., Salmoni, A, & Shoemaker, K. (2018). Making the grade: Building mental health resiliency through mentorship and physical activity – a course-based Smart, Healthy Campus project; mentors' perspectives. *International Journal of Evidence Based Coaching and Mentoring*, *16*(2), 84-98. DOI: 10.24384/000566

Carroll, L.,* Chippior, J.,* **Karmali, S**.,* Sriram, D.,* Aitken, S., & Ysseldyk, R. (2018). We are caregivers: Social identity is associated with lower perceived stress among rural informal caregivers. *Canadian Journal on Aging*, 1-17. DOI:10.1017/S0714980818000430

Vaillancourt, R., Truong, Y., **Karmali, S.**, Kraft, A., Manji, S., Villarreal, G., & Pouliot, A. (2017). How to mask the taste of medication for children: Validation of pictogram tool. *Canadian Pharmacists Journal*, *150*(1), 52-59. DOI: 10.1177/1715163516669383

PRESENTATIONS

Karmali, S., Ng, V., Battram, D. S., Burke, S., Morrow, D., Pearson, E., Tucker, P., Mantler, T., Cramp, A., Petrella, R., & Irwin, J. D. Parents' perspectives of a coaching and/or education intervention for parents with overweight/obesity and their children. Institute of Coaching - Coaching in Leadership and Healthcare Conference (International), Boston, MA, October 2019. Oral Presentation.

Fried, R. R., **Karmali, S**., Irwin, J. D., Gable, F. L., & Salmoni, A. Making the grade: Mentors' perspectives of a course-based, smart, healthy campus pilot project for building mental health resiliency through mentorship and physical activity. Health Promotion Ontario Conference (Local). Toronto, ON, November 2018. Poster Presentation.

Karmali, S., Irwin, J. D., Ng, V., Battram, D., Burke, S., Morrow, D., Pearson, E., Tucker, P., Mantler, T., Cramp, A., & Petrella, R. Coaching and/or Education for Parents with Obesity and their Young Children (Ages 2.5-10). 5th Child Health Symposium (Local), London, ON, May 2018. Oral Presentation.

Karmali, S., Irwin, J. D., Ng, V., Battram, D., Burke, S., Morrow, D., Pearson, E., Tucker, P., Mantler, T., Cramp, A., & Petrella, R. Coaching and/or Education for Parents with Obesity and their Young Children (Ages 2.5-10). 6th Canadian Obesity Student Meeting (National), London, Ontario, June 2018. Poster Presentation.

Leadership and Academic Mentorship Program (LAMP) Health Sciences Graduate Student Panel, Western University, February 13, 2018. Panelist.

ADDITIONAL SCHOLARLY ACTIVITIES

Manuscript Reviewer

Journal of Child and Family Studies July 2019

BMC Public Health July 2019

RESEARCH EXPERIENCE

Doctoral Research Program (Western University)
London, ON
PhD Candidate – Supervisor: Dr. Jennifer D. Irwin
September 2015 – December 2019 (Anticipated)

- Co-created research plan with supervisor, which focused on enhancing nutrition and

physical activity behaviours within the family unit via parental coaching and/or education intervention, with the goal of preventing obesity in children and families
- Successfully completed comprehensive examination on family based therapy for children with eating disorders
- Collaborated with co-investigators on grant applications, which resulted in securing $40,000 USD for doctoral research study
- Created educational webinars (focused on physical activity and nutrition) for participants using evidence-based information and consultations with co-investigators
- Recruited certified coaches to participate in study via research team's network
- Recruited participants via posters, radio advertisements, magazine advertisements, contacting local businesses and parenting groups, and social media
- Interviewed, hired, trained, and worked with four research assistants over the course of the study
- Data collection: completed all participant baseline and follow-up assessments (mid-, post-, and 6-months post-intervention) at participants' homes or on university campus, which consisted of measuring height, weight, waist circumference, and an in-person, audio-recorded interview; disseminated standardized and validated surveys to participants via Qualtrics; conducted telephone, audio-recorded interviews with coaches to ascertain their experiences with the study
- Data analysis: completed inductive content analysis on all interview data; compiled and cleaned quantitative data; met with statistician to confirm analysis plan; ran statistical analysis
- Knowledge translation: published protocol paper; in process of completing dissertation and manuscripts for publication

Smart Healthy Campus Initiative (Western University)
London, ON
Co-Investigator – Principal Investigators: Dr. Jennifer D. Irwin & Dr. Kevin Shoemaker
September 2016 – August 2017

- Assisted with evaluation of academic-year-long pilot study exploring experiences of senior students enrolled as "mentors" in a fourth year Kinesiology course focused on building resilience amongst first year students through physical activity
- Implemented surveys at pre-, mid-, and post-intervention time points, and conducted semi-structured interviews with mentors to track psychosocial experiences throughout duration of the intervention
- Participated in team meetings to debrief on program successes and areas for improvement, and planning future directions of program
- Conducted data collection (using Qualtrics and Google Analytics) and analysis (using Microsoft Excel and SPSS) of quantitative survey data
- Completed inductive content analysis of qualitative data, wherein research themes were extracted from interview responses
- Co-author on published manuscript of findings

Master of Science Research Program (Carleton University)
Ottawa, ON

Master's Student – Supervisors: Dr. Susan Aitken & Dr. Renate Ysseldyk
September 2013 – April 2015

- Collaborated with three Master's students on Interdisciplinary Health Research Project with community organization (to meet thesis requirement)
- Worked with staff at Fairview Manor – long term care home at Almonte General Hospital – to identify factors experienced by informal caregivers that impact their stress, and reviewed available sources of support
- Conducted focus group with hospital volunteers and informal caregivers in Almonte area to determine perspectives on impact of caregiver role, as well as availability of community supports while dependents wait for long term care spot
- Disseminated baseline demographic questionnaires, as well as standardized and validated questionnaires to informal caregivers
- Data analysis: completed inductive content analysis on interview data; compiled and cleaned quantitative data; ran statistical analyses using SPSS
- Knowledge translation: co-author on published manuscript of findings

University of Ottawa Heart Institute (Division of Prevention and Rehabilitation)
Ottawa, ON
Research Assistant – Principal Investigator: Dr. Sophia Papadakis

July 2014 – June 2015

- Assisted with evaluation of Ottawa Model for Smoking Cessation in Primary Care – a program aimed at providing patients with smoking cessation assistance through primary care providers
- Conducted various data management tasks including: data collection, entry, and analysis; writing evaluation reports based on study findings; and updating patient and provider databases
- Completed patient follow-up calls to evaluate efficacy of the program
- Assisted in selecting, hiring, and training of research assistants to work in primary care clinics

Canadian Agency for Drugs and Technologies in Health
Ottawa, ON
Research Assistant
February 2014 – July 2014

- Collaborated on a meta-analysis investigating use of Intensive Behavioural Intervention (IBI) as a treatment for autism spectrum disorders in children and youth
- Assisted in developing a search strategy, reviewing relevant citations using online tool Abstrackr, and analyzed selected articles
- Consulted with principal researcher after systematic review was complete to discuss discrepancies in article selection and come to consensus on disagreements

Children's Hospital of Eastern Ontario
Ottawa, ON
Co-Investigator – Principal Investigator: Dr. Regis Vaillancourt (Department of Pharmacy)

January 2014 – July 2014

- Wrote research proposal for evaluating and validating a set of pictograms that were placed on medication bottles to instruct parents on how to make medications taste better for children
- Assisted with data analysis with two additional unbiased reviewers to determine whether pictograms were effective and comprehensible by the majority of study participants
- Co-author on published manuscript of findings

BC Children's Hospital; BC Injury Research & Prevention Unit
Vancouver, BC
Research Assistant – Principal Investigator: Dr. Ian Pike (Department of Pediatrics)
November 2012

- Complied data and calculated rates of prominent causes of injury in all age groups throughout British Columbia, using current mortality and hospitalization statistics

BC Children's Hospital; BC Injury Research & Prevention Unit
Vancouver, BC
Research Assistant – Principal Investigator: Dr. Ron Barr (Development Neurosciences & Child Health)
October 2012

- Administered surveys via telephone to new parents regarding efficacy of implementation and messages of a *Shaken Baby Syndrome* program in BC
- Compiled parent and nurse survey response data necessary to evaluate program

BC Children's Hospital; BC Injury Research & Prevention Unit
Vancouver, BC
Research Assistant – Principal Investigator: Dr. Shelina Babul (Department of Pediatrics)
September 2012 – July 2013

- Assisted with evaluation of Concussion Awareness Training Toolkit (CATT) for clinicians, with aim to standardize recognition, diagnosis, treatment and management of concussions in British Columbia
- Administered surveys via telephone and e-mail to caregivers of children who were treated for concussions at BC Children's Hospital to determine treatments recommended by health practitioners and satisfaction with guidance provided
- Updated inventory of injury and violence prevention programming available in BC, which included: developing data collection tool for descriptions and key objectives of each program; consulting with BCiPLAN members, including representatives from Ministry of Health and BC Health Authorities, regarding new programming; conducted search of provincial programming not previously captured and contacted program providers for full program details

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OTHER PROFESSIONAL EXPERIENCE

Western University (Department of Health Studies)
London, ON

Graduate Teaching Assistant – Professor: Dr. Jennifer D. Irwin
January – April 2018; January – April 2019

- Responsible for working with 4th year undergraduate students in HS4200G (Advanced Health Promotion) on full-term research projects
- Provided support to students via office hours, e-mail, and during class hours
- Marked and provided students with in-depth written feedback for assignments including: needs assessments; epidemiological reviews; social marketing campaigns; evaluation reports; and executive summaries
- Ensured students received feedback and support in constructive and timely manner

Western University (Department of Occupational Therapy)
London, ON
Graduate Teaching Assistant – Professor: Dr. Carri Hand
September 2015 – April 2016; September 2016 – April 2017

- Collaborated with supervisor to prepare class lecture materials (e.g. PowerPoints and guest speakers) for Occupational Therapy Professionalism course
- Updated OWL Sakai (online learning management system) with weekly readings and resources, assignments, and grades
- Assisted with marking assignments and in-class presentations

Stroke Recovery Association of British Columbia (Templeton Branch)
Vancouver, BC
Branch Coordinator
June 2012 – July 2013

- Organized and implemented weekly programs for branch members
- Prepared group activities suitable to members' capabilities and designed to promote recovery and overall well-being
- Recruited and trained volunteers and sought out multidisciplinary professionals to work with the members
- Supported caregivers in understanding stroke recovery and locating other community resources

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VOLUNTEER EXPERIENCE

Obesity Canada – Students and New Professionals Committee
London, ON
Chapter Chair – Western University
September 2018 – present

- Assembled executive team to create committee plan for year
- Disseminated survey to undergraduate students in various health-related faculties to determine prominence of weight-related stigma in potential future health-care providers
- Collaborated with executive team to collect and analyze data, as well as manuscript preparation
- Consulted with faculty supervisors to determine scope of manuscript and publication plan
- Participated in online meetings with National Executive team to provide and receive

updates from other chapters

Investing in Children London, ON
After School Program Volunteer
November 2016 – June 2017

- Helped run program that aims to promote healthy eating, active living, and overall personal wellness in students (grades 5-8) at Ealing Public School
- Assisted with organizing and implementing various activities alongside program coordinator, such as: sports, games, crafts, and experiments

Aga Khan Health Board for Canada, *Know Your Numbers Chart Your Heart* Program
Vancouver, BC
Program Assistant
June 2012 – March 2013

- Raised awareness of cardiovascular disease and its modifiable risk factors within the South Asian community through information booths, organizing seminars, and community outreach
- Assisted with implementation of cardiovascular disease screening sessions throughout Greater Vancouver
- Assisted in planning sustainable and culturally-sensitive interventions to reduce risk factors within the community

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SKILLS

- Communication – Excellent written and verbal presentation skills; extensive experience interacting with research teams, patients, and research study participants
- Leadership and Management – Attention to detail; strength in teaching and conflict resolution; trained in recognizing and responding to conflicting values; excellent organizational skills
- Computer Skills – MS Office, Open Office, Mac Operating Systems, web-based research tools; created infographics
- Data Entry and Analysis – Intermediate experience with various software: Mendeley; SPSS; NVivo; and ESHA Food Processor Nutrition and Fitness Software
- Research Skills – Conducted literature reviews; annotated bibliographies; briefing notes; assembled and analyzed research findings; arranged focus groups; conducted research interviews; created questionnaires; experienced in quantitative data analysis, and inductive content analysis (qualitative research analysis)

ADDITIONAL QUALIFICATIONS & PROFESSIONAL DEVELOPMENT

Specialist Knowledge Translation Training (SKTT) for Graduate Students (Full-Day Workshop) – Toronto, ON, *May 2019*

- Reviewed importance of knowledge translation (KT) and its applicability to healthcare and other sectors

- Gained knowledge and tools to develop effective KT plans (i.e., KT goals, audiences, and strategies)
- Improved ability to communicate research findings to multiple (non-academic) audiences

Certificate in University Teaching and Learning – Teaching Support Centre, Western University, *In Progress*

- Program to enhance the quality of teaching by graduate and postdoctoral students, and to prepare them for a future in university education
- Program is divided into: Teaching Assistant Training Program (completed June 2017), Future Professor Workshop Series (completed October 2017), Teaching Mentor Program (in progress), creation of a teaching portfolio/dossier (in progress), creation of a course outline (in progress)
- Workshops attended: (1) Preparing for an academic job interview; (2) Ethics of teaching; (3) Introduction to scholarship of teaching and learning; (4) Successful graduate student-supervisor relationship; (5) Creating a teaching dossier (part 1); (6) Creating a teaching dossier (part 2); (7) From the OWL's nest; (8) Developing your own course; (9) Communication of science concepts; and (10) Potent PowerPoint: Delivering effective lectures

safeTALK Certification (3 Hour Training) – Western University, *January 2018*

- Training in noticing and responding to situations where suicide thoughts might be present
- Hands-on practice and development of suicide prevention communication techniques

Mental Health First Aid (12 Hour Basic Training) – Western University, *December 2017*

- Offered by the Mental Health Commission of Canada
- Trained to provide immediate support to individuals experiencing a mental health problem
- Able to have a conversation about mental health related issues, and provide information about professional (and other) supports

An Equity-Informed Approach to Tobacco Treatment with Priority Populations: Mental Health and Addictions – London, Ontario, *March 2017*

- Full-day workshop, led by Dr. Jennifer Irwin & Dr. Don Morrow, focused on an equity-informed approach to smoking cessation in the context of mental health and addictions
- Gained skills, knowledge, and confidence to provide smoking cessation counseling during interactions with individuals, in context of mental health and addictions

Computer-Assisted Qualitative Data Analysis with NVivo (2-day training) **—** Western University, February 2017

- Completion of a 2-day workshop, led by Dr. Joshua Tobias, focused on the applications of NVivo for data management, analysis, and presentation

Monarch System Motivational Interviewing/Coaching for Health Professionals: Level 1 – Western University, *January 2017*

- Completion of full-day, level 1, intensive workshop – conducted by Dr. Jennifer D. Irwin – learning and applying Motivational Interviewing and Co-Active Coaching skills for health professionals

Doctoral Students' Leadership Workshop – Western University, *February 2017*
- Full-day workshop, led by Dr. Mary Crossan & Dr. Brenda Nguyen, focused on leadership in the context of character, education, and career development

Dr. Thomas Gordon's Leadership Effectiveness Training (LET) – Western University, *November 2016*
- Intensive, 3-day, 15 hour program, offering leadership model for creating co-operative relationships in the workplace
- Participated in skill-building activities via coaching, presentations, video demonstrations, group discussions, and workbook exercises
- Acquired skills related to: active listening; conflict resolution; recognizing and acknowledging road blocks in conversation; and, recognizing and acknowledging values

Tri-Council Policy Statement-2 (TCPS-2) Core Certificate – *July 2014*

Good Clinical Practice (GCP) Guidelines Certificate— *July 2014*

AWARDS

- Graduate Student Teaching Assistant Awards – Nominated for 'Graduate Student Teaching Awards of Excellence' by course instructor and undergraduate students (April 2019)
- Graduate Student Teaching Assistant Awards – Nominated for 'Graduate Student Teaching Awards of Excellence' by undergraduate students (April 2018)
- Western University Ontario Graduate Scholarships (OGS/QEII) – Waitlist (April 2018, for academic year beginning September 2019)
