

An exploration of the translation of MEND 5-7 for the BC context using the RE-AIM framework

by

Shabnam Almasi  
B.Pharm, University of Pune, 2007

A Thesis Submitted in Partial Fulfillment  
Of the Requirements for the Degree of

MASTER OF SCIENCE

In the School of Exercise Science, Physical and Health Education

© Shabnam Almasi, 2014  
University of Victoria

All rights reserved. This thesis may not be reproduced in whole or in part, by photocopy or other means, without the permission of the author.

## **Supervisory Committee**

An exploration of the translation of MEND 5-7 for the BC context using the RE-AIM framework

by

Shabnam Almasi  
B.Pharm, University of Pune, 2007

### **Supervisory Committee**

Dr. Patti-Jean Naylor, School of Exercise Science, Physical and Health Education  
**Supervisor**

Dr. Joan Wharf Higgins, School of Exercise Science, Physical and Health Education  
**Departmental Member**

## Abstract

### Supervisory Committee

Dr. Patti-Jean Naylor, School of Exercise Science, Physical and Health Education  
Supervisor

Dr. Joan Wharf Higgins, School of Exercise Science, Physical and Health Education  
Departmental Member

**Introduction:** Prevalence of obesity and overweight in children is growing in Canada and worldwide. In recent years multiple approaches have been utilized to treat childhood obesity. Multidisciplinary and family-based approaches have been shown to be successful in the management of obesity and overweight in children however, there is limited evidence about their use with younger children. Therefore the purpose of this thesis was to explore the translation of a family-based intervention, MEND 5-7, for the British Columbia (BC) context using the RE-AIM framework.

**Methods:** A mixed methods design was used. Twenty-four children and their families who were enrolled in MEND program across 3 cities participated in the study. Anthropometrics and self-reported lifestyles and attitudes were measured for both children and parents pre and post program. MEND staff completed recruitment and registration tracking, and session feedback forms; were interviewed about implementation and meeting minutes were analysed for the process evaluation. In addition parent feedback surveys and site visit feedback forms were also included. Data were organized and analysed based on the RE-AIM framework.

**Results:** The sample was too small to be representative but the demographics of the group appeared to be similar to the BC population. A number of significant improvements were seen related to physical activity (screen-time,  $p = .002$ ; parent self-efficacy for increasing play and enjoyment,  $p = .05$ ) and eating habits (parent fruit and vegetable consumption,  $p = .009$ ). The small number of participants made it difficult to draw a valid conclusion about the changes in anthropometry. Data on implementation showed that families and group leaders were highly satisfied with the program. The program was found to be feasible and facilitators included team work, flexibility, participants' engagement, community relations, preparation and planning, and support. Barriers to implementation included were time, recruitment, parental involvement, diversity, lack of flexibility in manual and location.

**Conclusion:** MEND 5-7 appeared feasible for the BC population, however recruitment remains a significant challenge to program operations. Further research using an experimental design is needed.

## Table of Contents

Supervisory Committee .....	ii
Abstract.....	iii
Table of Contents .....	v
List of Tables .....	viii
List of Figures.....	ix
Acknowledgments.....	x
Chapter 1 .....	1
Introduction.....	1
1.1 Overview.....	1
1.2 Statement of Purpose.....	6
1.3 Research Questions.....	6
1.4 Hypothesis.....	6
1.5 Limitations.....	7
1.6 Delimitations.....	7
1.7 Assumptions.....	7
1.8 Operational Definitions.....	7
Chapter 2.....	9
Review of Literature .....	9
2.1 Childhood Obesity.....	9
2.2 Childhood Obesity Tracks into Adulthood .....	10
2.3 Health Risks Associated with Childhood Obesity .....	11
2.4 Treatment of Childhood Obesity.....	12
2.5 Family Influence on Childhood Obesity .....	15
2.6 Family-based Interventions .....	16
2.7 Process Evaluation .....	24
2.7.1 Why A Process Evaluation? .....	25
2.7.2 Process Evaluation Designs .....	27
2.7.3 Process Evaluation Studies .....	29
2.8 Summary of the Findings .....	36
Chapter 3 .....	38
Methodology.....	38
3.1 Research Design .....	38
3.2 Ethics.....	38
3.3 Participants .....	39
3.4 Recruitment .....	39
3.5 Intervention .....	39
3.6 Procedures .....	40
3.7 Instrumentation.....	41
3.7.1 Reach.....	41
Demographic data .....	41
MEND Registration Tracking Tool.....	42
Recruitment Strategy Form .....	42
Internal Stakeholder Interview .....	42
3.7.2 Efficacy .....	42

Anthropometry-Child .....	42
Anthropometry- Parent.....	43
Physical Activity and Sedentary Behaviour .....	43
Eating Habits .....	44
Strength and Difficulties Questionnaire .....	44
Self-Report Changes.....	44
3.7.3 Implementation.....	45
Parents' Perceived Barriers and Facilitators.....	45
Parents Satisfaction Survey.....	45
Child Satisfaction Survey.....	45
Facilitator Group Session Feedback Forms.....	45
Site Visit Forms.....	46
Quality Assurance Forms .....	46
Training Program Evaluation Form .....	46
Relevance .....	46
3.8 Data Analysis.....	47
3.8.1 Quantitative Data.....	47
3.3.2 Qualitative Data.....	47
Chapter 4 .....	48
Results .....	48
4.1 Descriptives .....	48
4.2 Reach.....	50
4.2.1 Recruitment .....	51
4.2.2 Attendance and Retention .....	51
4.2.3 Accessibility.....	52
4.2.4 Representativeness .....	53
4.3 Efficacy .....	53
4.3.1 Anthropometry and Behavioural Changes .....	56
4.3.2 Self-reported Changes .....	55
4.3.3 Qualitative Themes related to Impact.....	56
4.4 Implementation .....	57
4.4.1 Facilitators.....	58
4.4.2 Barriers .....	59
4.4.3 Resources .....	61
Facilitators training Feedback .....	63
4.4.4 Relevance and Appropriateness.....	64
4.4.5 Satisfaction .....	64
4.4.6 Fidelity .....	65
4.4.7 Quality .....	67
4.4.8 Safety .....	67
Chapter 5 .....	68
Discussion .....	68
5.1 Overview.....	67
5.2 Reach .....	68
5.3 Efficacy.....	70
5.4 Implementation .....	72

5.4.1 Facilitators .....	72
5.4.2 Barriers.....	73
5.4.3 Resources .....	74
5.4.4 Fidelity.....	74
5.4.5 Relevance and Appropriateness .....	76
5.4.6 Quality .....	76
5.4.7 Safety .....	76
5.5 Conclusion .....	77
5.6 Limitations and Delimitations.....	77
5.7 Future Recommendations .....	78
Bibliography .....	80
Appendix A: Family-based Weight Management Programs.....	93
Appendix B: Ethics.....	98
Appendix C: Demographic Data MEND 5-7 .....	101
Appendix D: Medical Questionnaire.....	104
Appendix E: Physical activity and Sedentary Behavior Questionnaire .....	105
Appendix F: Nutrition Questionnaire .....	107
Appendix G: Strength and Difficulty Questionnaire.....	113
Appendix H: Parenting Questionnaire.....	114
Appendix I: MEND 5-7 Feedback Form for Parents/caregivers.....	116
Appendix J: MEND 5-7 Facilitators training Feedback form .....	124

## List of Tables

Table 1 <i>Component of Process Evaluation</i> .....	26
Table 2 <i>Instruments Used for Measuring Reach, Efficacy, and Implementation of MEND 5-7</i> .....	41
Table 3 <i>Demographics/Family Characteristics of Participants</i> .....	48
Table 4 <i>MEND Participants Profile for families and Children that Completed both pre and post-test Measurements</i> .....	50
Table 5 <i>Measures of Attendance and Dropouts Using Registration Tracking Form</i> ....	52
Table 6 <i>Representativeness of the Sample Measured by Number of Targeted Population and Enrolled participants</i> .....	53
Table 7 <i>Changes in Anthropometry, Physical activity, Dietary Habits, Psychological, and Parenting Self-Efficacy after Participation in MEND</i> .....	54
Table 8 <i>Qualitative Themes and Subthemes Related to Program Impact</i> .....	56
Table 9 <i>Summary of the Theme and Subthemes Related Facilitator Reported by Staff via Interviews</i> .....	58
Table 10 <i>Summary of the Subthemes Related to Barrier that Emerged from Staff Interview and parents Feedback Forms</i> .....	60
Table 11 <i>Themes and Subthemes Related to Resources that Emerged from stakeholders' Interview</i> .....	62
Table 12 <i>Results of parents reported Child Satisfaction Survey</i> .....	65
Table 13 <i>Fidelity to Manual Content Reported by MEND Activity Leaders</i> .....	66
Table 14 <i>Fidelity to Program Structure Reported by MEND Workshop Leaders</i> .....	67
Table 15 <i>Safety Issues that were Followed in MEND Delivery Sites, Reported by Regional Coordinator via Site Visit Reports</i> .....	67

## List of Figures

<i>Fig1.</i> Recruitment strategies used across Three MEND Delivery Sites .....	51
<i>Figure2.</i> Accessibility of the program reported by parents through parent feedback Forms .....	52
<i>Figure3.</i> Parent-reported behaviour changes via parents' survey .....	56
<i>Figure4.</i> Relevance and appropriateness of information covered in sessions .....	64
<i>Figure5.</i> Results of parent satisfaction survey.....	65

## Acknowledgement

First and foremost I wish to thank my supervisor, Dr. Patti- Jean Naylor, for her ongoing support throughout this process. I am so deeply grateful for her help and valuable guidance throughout this thesis and through my entire program of study that I do not have enough words to express my deep and sincere appreciation. I would like to thank my committee member Dr. Joan Wharf Higgins for her remarks and engagement through the learning process of this master thesis and being an inspiration in many ways.

I also thank MEND staff and evaluation team members at Childhood obesity Foundation who offered their support and help through the data collection process. I would also like to express my gratitude to my graduate secretary, Rebecca Zammit, for all her help along the way.

My deepest gratitude is sent to my beloved parents for their warm support which brings belief and hope to my life. Finally and most importantly, I would like to thank my husband. This thesis would have not been possible without his support, encouragement and love.

# 1 Introduction

## 1.1 Overview

The growing prevalence of overweight in children worldwide presents a serious risk to public health and economic security (Wang & Lobstein, 2006). Recent studies reveal a stabilizing, although persistent trend in the rate of overweight and obesity in children and adolescents (Ogden et al., 2006; Ogden, Carroll, Curtin, Lamb, & Flegal, 2009). Obesity and overweight has increased more dramatically in economically developed countries and in urbanized populations (Wang & Lobstein, 2006). According to the World Health Organization (WHO), it is estimated that more than 40 million children under five years of age were overweight in year 2010, with close to 35 million of these children in developing countries (WHO, 2012). According to the Public Health Agency of Canada (2011), measured obesity among children and youth aged 6 to 17 was 8.6%, and it was estimated that 6.3% of children aged 2 to 5 were obese.

There is evidence that diminished physical activity and the time spent by children and adolescents in sedentary behaviour are associated with increased body weight and fat. Specifically, television watching and video game playing have become an increasing concern (Saelens & Daniels, 2003). There is also evidence to suggest that dietary patterns contribute to increasing overweight and obesity (Shields, 2005).

The prevailing perception in the health care, academic and public domain is that the high prevalence of obesity in children and adolescents should be cause for concern (Andersen, 2000). Indeed, research suggests that obese boys and girls are at an increased risk of developing a number of detrimental physical and mental conditions (Must & Strauss, 1999). Some of the

physical health consequences of obesity are hyperlipidaemia, hypertension, insulin resistance and abnormal glucose tolerance, which occur with increased frequency in obese children and adolescents (Freedman, Dietz, Srinivasan, & Berenson, 1999; Reilly et al., 2003; Weiss et al., 2004). Depression and anxiety, self-esteem, body dissatisfaction, emotional problems are among the psychological factors associated with childhood obesity (Russel-Mayhew, McVey, Bardick, & Ireland, 2012). Of further concern are the some of the social issues that lead to these psychological issues such as the teasing, discrimination, and victimization obese children are known to endure (Must & Strauss).

Furthermore, research suggests that childhood obesity tracks into adulthood (Daniel et al., 2005). In a systematic review conducted by Singh et al. (2008) all of the studies reported an increased risk of overweight and obese youth becoming overweight adults, suggesting that the likelihood of persistence of overweight into adulthood is moderate for overweight and obese youth. Similarly, the probability of childhood obesity persisting into adulthood is estimated to increase from 20% at 4 years of age to approximately 80% by adolescence (Guo, Wu, Cumelea, & Roche, 2002), with numbers increasing when one or both parents are overweight. Evidence demonstrates that obesity tracks from early childhood through to adolescence as well (Singh et al., 2008). Therefore, to prevent obesity in later stages of life, researchers have increasingly called for interventions that target young children in the context of the home and family environment (Haire-Joshu et al., 2008; Saunders, 2007).

There is evidence that obesity runs in families (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997) and parental obesity more than doubles the risk of adult obesity among both obese and non-obese children less than 10 years of age (Whitaker et al., 1997). Obese children under three years of age without obese parents are at low risk for obesity in adulthood, but among older

children, obesity is an increasingly important predictor of adult obesity, regardless of whether the parents are obese (Whitaker et al., 1997).

There is also considerable evidence that eating and activity behaviours are shaped by parental behaviours (Birch & Davison, 2001; Golan & Crow, 2004), and early parenting dietary habits have a long-term influence. Eating habits such as eating regularly scheduled meals, using food as an incentive or threat, and eating dessert, are often incorporated into development of adult eating styles. It is further argued that parents who are supportive and who change their own weight and eating patterns tend to be more successful with implementing family change (Golan, 2006). Because the parent, in most families, is the decision-maker concerning the foods that are available and the activities in which children engage, it is necessary to evaluate and intervene in lifestyle management with the parents as well as with the children (Golan).

Therefore, parent participation in obesity prevention is increasingly emphasized given links between parents' attitudes, knowledge, and behaviour and children's dietary, physical activity, and screen-based behavioural factors associated with childhood obesity (Lindsay et al., 2006). There's also a growing body of research and relevant theory emphasizing the importance of utilizing parents as change agents in childhood obesity prevention (Golan, 2006). Notably, the results of a recent meta-analysis indicated that the degree of parental involvement in the treatment programs was significantly associated with treatment efficacy (Kitzmann, 2010).

A review of the literature shows that there are a number of successful childhood weight management programs conducted in different settings with some common features in terms of program components and measurements (Barton, Walker, Lambert, Gately, & Hill, 2004; Golley et al., 2007; Kalarchian et al., 2009; Lazorick, Crawford, & Hardison, 2013; Magarey et al., 2011; Shelton et al., 2007; Stark et al., 2011; Woolford, et al., 2011).

Based on this literature, it has been hypothesized that targeting eating and activity change in the child and parent, along with teaching parents the behavioural skills to facilitate child behaviour change, could mobilize family resources to improve the efficacy of childhood obesity treatments. Simultaneously treating the parent and child benefits both, and creates positive relationships between child and parent weight change (Wrotniak, Epstein, Paluch, & Roemmich, 2004; 2005). International recommendations state that the core elements of any initiative to address pediatric obesity should involve the whole family and include nutrition education, behaviour modification and promotion of physical activity (Luttikhuis et al., 2009; Summerbell et al., 2003). Family based interventions have been proved to be effective in reducing body mass index (BMI) and changing behaviour (Avery, et al, 2012; Hughes et al., 2008; Jinks, English, & Coufopoulos, 2012).

Mind, Exercise, Nutrition, Do It! (MEND) is a program developed by the Institute of Child Health, University College London, and the Great Ormond Street Hospital for Children in the UK. The MEND Program is a family-based weight management intervention for overweight and obese children aged 2-4, 5-7 and 7-13, designed for delivery in community settings. The MEND Program equips families and communities with nutrition, exercise, and behaviour change knowledge and skills, to establish and maintain healthy lifestyles (Chahine, Potter, & Freeman, 2010). A randomized control trial of the MEND program (Sacher et al., 2010) showed that participation in MEND was effective in reducing adiposity in children and those effects were sustained nine months after the intensive part of the intervention. Similarly, findings from a feasibility study of MEND 5-7 showed that the program was successful in making significant reductions in BMI, BMI z-score, waist circumference, waist z-score and child total difficulties score (Smith et al., 2013). Evidence that MEND was scalable (in England) and feasible to

implement has led to international dissemination of the initiative. In the UK, MEND has partnered with the most eminent child health organizations such Great Ormond Street Hospital for Children NHS Trust and University College London Institute of Child Health for 20 years. In Australia, MEND is collaborating with Deakin University on a randomized controlled trial (RCT) to evaluate the effectiveness of MEND 2–4 in the state of Victoria. MEND was implemented internationally in New Zealand, Australia, and Denmark. In the U.S., MEND is delivered in Colorado, California, Texas and Washington DC in corresponding YMCA locations. Results from a pilot study to test the implementation of MEND in USA were published in 2011 (Byrd-William et al., 2011). MEND 7-13 and 2-5 are also adapted for communities in Australia (South Wales and Queensland). In Queensland MEND 7-13 is delivered to aboriginal communities. In Canada, British Columbia has adopted the MEND model for 7-13 and 5-7 year olds.

Considering the large variety of childhood weight management programs, it is very important for public health authorities to know which program works the best in their context. Therefore there is need for an evaluation to evaluate the feasibility of MEND in BC context. The RE-AIM framework designed by Glasgow, Vogt, and Boles (1999), is a research and evaluation framework that provides guidance for evaluating the MEND program in BC. RE- AIM provides information about whether a program works in the real world and whether it is worth future investment. RE-AIM addresses five dimensions: Reach, Effectiveness, Adoption, Implementation, and Maintenance. For the purposes of this evaluation the focus will be on reach, effectiveness and implementation. According to Glasgow, Vogt, and Shawn (1999), reach is an individual-level measure of participation and is measured by comparing participants with the target population. Efficacy is described as the overall positive and negative outcomes of the

study. Adoption represents the organizations that adopt the program and is usually assessed by direct observations or surveys. On the other hand, implementation measures the extent to which the program was implemented as intended. Finally, maintenance is an individual as well as an organization level measure to identify the long term maintenance of the behaviour change.

## **1.2 Statement of purpose**

The purpose of this study was to evaluate the translation of MEND 5-7 into the BC context specifically exploring its feasibility, using RE-AIM framework.

## **1.3 Research Questions**

- 1) How effective were the communication/awareness activities, and access points at reaching the eligible target audience?
- 2) How effective was the program at influencing the health, physical activity, nutritional and psychological outcomes on participants and families?
- 3) What were the success stories, facilitators and barriers to implementing the intervention, and the level of acceptability, quality and fidelity in BC?

## **1.4 Hypotheses**

- 1) MEND 5-7 will be effective in reaching the target population and the program will be highly acceptable to BC program leaders, parents and children.
- 2) MEND will have a positive impact on physical activity and nutritional behaviour of the families.
- 3) The implementation of MEND 5-7 will experience more facilitators than barriers in BC context.

## 1.5 Limitations

- 1) As with all intervention studies, recruitment bias and selective drop out may influence the results.
- 2) The direct outcome measures reflected change over a 10 week time period and may by definition be modest. Ideally, longer term outcome measures (e.g., 3, 6, 12 months) and post-intervention measures are needed to determine the broader impact of the investment.

## 1.6 Delimitations

- 1) Findings were limited to the BC context and families of children age 5-7.
- 2) Potential comparison design evaluation (RCT) of MEND 5-7 may provide a better understanding of intervention effectiveness and impact.

## 1.7 Assumptions

- 1) Responses from participants were honest and accurate.
- 2) Instruments used were reliable.

## 1.8 Operational Definitions

**1) Family- based program:** Program in which at least one parent (or other caregivers) and siblings are included as an integral part of the intervention and their involvement throughout the treatment is seen as a necessary component of the change process.

**2) Waist circumference:** Waist circumference is commonly used to assess abdominal obesity and has been established as a predictor of increased morbidity and mortality independent of body mass index (Janssen, Katzmarzyk, & Ross, 2004) and is measured by calibrated plastic tapes.

**3) Physical activity:** Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure (Caspersen, Powell, & Christenson, 1985). For

the purpose of this study physical activity will be measured by self-report data from parent's surveys.

**4) Obesity and Overweight -The International Obesity Task Force (IOTF):** In 2000, the IOTF published BMI cut-points for defining overweight and obesity in children between 2 and 18 years. These references are based on children living in six countries (i.e., United States, Brazil, Great Britain, Hong Kong, Netherlands, Singapore) and can be extrapolated to the widely accepted definitions for adult overweight and obesity; a BMI  $\geq 25$  and a BMI  $\geq 30$  respectively, shown to be predictive of adverse health outcomes in adults. Using these cut-points, a preschool child is considered overweight with a BMI  $\geq 91$ st and obese with a BMI  $\geq 99$ th percentile, respectively.

**5) Reach:** The extent to which intervention is able to reach the target population and the extent that the target population participates in the program (Linnan & Steckler, 2002) as assessed by calls of interest, program registrations and attendance.

**6) Efficacy:** Efficacy is defined as the outcome of the health promotion interventions including, health behaviours and also a participant centered quality of life perspective (Glasgow, Vogt, & Boles, 1999).

**6) Implementation:** At the setting level, implementation refers to the intervention agents' fidelity to the various elements of an intervention's protocol. This includes consistency of delivery as intended and the time and cost of the intervention.

## 2 Literature Review

This literature review provides an overview about childhood obesity, its prevalence, and its consequences; and its associated physical and psychological issues. Various treatment approaches will then be addressed and a number of successful pediatric weight management interventions will be discussed (Appendix A). In addition, an overview of literature supporting the importance and necessity of process evaluation and an overview of process evaluation approaches and studies will be presented.

### 2.1 Childhood Obesity

The prevalence of obesity and overweight is growing in adult and child populations throughout the world (Lobstein 2004; Wang 2006; WHO, 2000). The most recent statistics from the Centers for Disease Control and Prevention indicate that from 1998 through 2003, the prevalence of obesity among U.S. pre-school children increased from 13.05% to 15.21%, and the prevalence of extreme obesity increased from 1.75% to 2.22% (CDC, 2012). According to the 2006 Canadian clinical practice guidelines, obesity has become “the most prevalent nutritional problem in the world, eclipsing under nutrition and infectious disease as the most significant contributor to ill health and mortality” (Lau et al., 2007, p.1). More than 40 million children under the age of 5 were overweight or obese in 2012 (WHO, 2012). According to the Public Health Agency of Canada (2011), measured obesity was 8.6% among children and youth aged 6 to 17, and it was estimates that 6.3% of children aged 2 to 5 were obese.

Factors that increase the risk of obesity are identified as social factors, parental overweight, birth weight, timing or rate of maturation, physical activity, dietary habits, and other behavioural or psychological factors (Parsons, Power, Logan, & Summerbell, 1999).

Within countries, socio-demographic gradients in overweight have been observed and overweight tends to be more prevalent among socio-economically disadvantaged children in developed countries (Shrewsbury, 2008) and children of higher socio-economic status in developing countries (Lobstein, 2004; Wang, 2002). It has been observed that among countries in economic transition obesity is more prevalent among higher income groups and in urban, compared with rural, communities (Hong, 2007; Wang, 2002), but there are indications that obesity rates are higher in poorer populations, in adults at least (Popkin, 2004). With regards to ethnicity, research shows a significant difference in prevalence of obesity in United States among Hispanic (21.8%), African American (21.5%) and white children (12.3%) (Strauss, 2001).

## **2.2 Childhood obesity tracks into adulthood**

Addressing obesity in childhood is critical because childhood and adolescence are important periods for the development of obesity (Dietz, 1994). Obesity in childhood is of great concern because its physical consequences could affect one's psychosocial development (Bray, Bouchard, & James, 1998; Must & Strauss, 1997). Once people develop obesity, it is difficult and costly to cure this condition, and gaining a healthy weight is often a challenge for most patients (Bray, Bouchard, & James, 1998).

In addition, obesity in childhood is an independent risk factor for adult obesity (Parsons, Power, Logan, & Summerbell, 1999; Singh et al., 2008; Whitaker et al., 1997). Results from a systematic review by Singh (2008) revealed that risk of overweight children remaining obese adults is at least twice that for normal weight children, and the risk is usually higher for adolescents and those who were obese during childhood. Therefore addressing childhood obesity is a matter of concern. Furthermore Nader et al. (2006) suggested despite parental beliefs that young children will outgrow their "baby fat" (Jain et al., 2001), longitudinal studies show that

children with BMI greater than 95th percentile between the ages of 2 and 5 years of age are five times as likely to be obese by age 12 compared to children below a BMI of the 85th percentile.

### **2.3 Health risks associated with childhood obesity**

Preventing and treating pediatric overweight and obesity is important for the health of children today and the health of adults in the future. Children who are overweight or obese have an increased risk for developing a number of medical conditions, most remarkably dyslipidemia, Type 2 diabetes, and psychosocial issues (Pediatric Obesity Guideline, 2008). Furthermore, there is evidence of an association between adolescent obesity and increased risks to health in adult life (Must, 1992; 1999; Power, 1997). Alarmingly, early vascular lesions have even been detected in obese children as young as 3–8 years of age, suggesting that obesity related atherogenesis begins in early childhood (Speiser et al., 2005). Additionally, childhood obesity is associated with a range of medical conditions, including poor pulmonary function, advanced growth and early maturity, hepatic steatosis and cholelithiasis asthma, low grade systemic inflammation, sleep apnoea, polycystic ovary disease and orthopaedic complications (Dietz 1998; Ebbeling, Pawlak, & Ludwig, 2002; Lobstein, Baur, & Uauy, 2004; Reilly et al., 2003).

Results of a recent study by Sei et al. (2007) showed that the majority of severely obese children who were included in the study frequently had metabolic complications, hypertension, hypertriglyceridemia, hyperuricemia, hyperinsulinemia, and liver dysfunction. Research also supports that weight gain among obese children is associated with a decrease in insulin sensitivity (Reinehr, Kiess, Kapellen, & Andler, 2004). Research shows that the prevalence of obstructive sleep apnea among obese children and adolescents could be as high as 60% (Verhulst, Van Gaal, Backer, & Desager, 2008). In addition Blount disease, Slipped Capital

Femoral Epiphysis (SCFE), fracture risk, and spinal complications are among major Orthopedic complications related to obesity in adolescents (Wills, 2004).

While there have been few studies indicating associations between pediatric obesity and anxiety disorders, a recent study found modest associations after controlling for age and race (Hilman, Dorn, & Huang, 2012). Overweight children are also known to become targets of early discrimination (Dietz, 1998; Puhl & Latner, 2007; Tang-Peronard & Heitmann, 2008). Furthermore results of a longitudinal study showed that obese children from different ethnicities had a lower self-esteem compare to their non-obese counterparts (Strauss, 2000). In addition decreasing levels of self-esteem in obese children were significantly associated with smoking and alcohol consumption, compared with obese children with increased self-esteem (Strauss). Results from another study showed that psychosocial stress in the family is associated with increased chance of obesity at age five (Koch, Sepa, & Ludvigsson, 2008). Similarly, a nationally representative sample of children suggests that aggressive and destructive behaviours at 24 months of age are predictive of disproportionate increase in BMI by age 12 (Anderson, He, Schoppe-Sullivan, & Mus et al., 2010). It is clear that interventions are needed to reduce the risk of these consequences.

Research shows a relationship between childhood obesity and depression (Erickson, Robinson, Haydel, & Killen, 2000; Zeller, Saelens, Roehrig, Kirk, & Daniels, 2004) and a number of studies have found that childhood depression increase the risk of obesity in adulthood (Pine, Goldstein, Wolk, & Weissman, 2001).

## **2.4 Treatment of Pediatric Obesity**

Different approaches have been used to treat childhood overweight and obesity. Some studies focus primarily on dietary interventions or physical activity, whereas some interventions

have behavioural components as the main focus. A review by Grimes-Robison and Evans (2008) identified characteristics of successful weight management programs. Parental involvement, education on diet and physical activity, and interdisciplinary approach were among the key factors to determine the success of weight management programs. A review of the literature shows a number of multidisciplinary interventions that include these factors; focusing on dietary change and physical activity and including behavioural components. These interventions were designed for various settings such as the family and home, schools, clinics, and weight loss camps (Golley, Perry, Magarey, & Daniels, 2007; Hughes et al., 2008; Kalarchian et al., 2009; Nowicka, Lanke, Pietrobelli, Apitzsch, & Flodmark, 2009; Skelton, DeMattia, & Flores, 2008; Scharf & Stark, 2010; Woilford, Sallinen, Clark, & Freed, 2010). Some of the components now included in multidisciplinary interventions have been tested in single focus interventions. These are overviewed briefly following.

**Behavioural interventions:** Epstein and colleagues introduced behavioural interventions as an approach to childhood obesity treatment. Their work was based on behaviour change model using reinforcement, monitoring and involving parents or caregivers in the behaviour change process (Epstein, Roemmich, & Raynor, 2001). Behavioural interventions often use social cognitive theory and theory of planned behavior (Knowlden & Sharma, 2012) however, interventions need to be tailored based on the stage of behaviour (Johnson et al., 2007).

**Physical activity ‘only’ interventions:** Interventions targeting physical activity try to reduce overweight and obesity by increasing physical activity and/or decreasing sedentary behaviours as increased levels of sedentary behaviour has been associated with increased risk of obesity (Gortmaker et al., 1996). Research shows that increasing physical activity and reducing sedentary behaviour is a successful approach to reduce obesity in children (Epstein et al., 1995).

In fact this is supported by a study by Atlantis, Barnes, and Singh (2006) showing that aerobic exercise of 155–180 min/weeks (moderate-to-high intensity) is effective in treatment of overweight in children/adolescents. In fact Epstein and colleagues showed that a 4-month intervention on increasing physical activity and decreasing sedentary behaviour had a significant improvement on child fitness (Epstein et al., 1995).

**Dietary interventions:** Some pediatric obesity treatment programs mainly focus on dietary changes. Several principles have been identified as the parts of an effective dietary intervention for children: a) individualization, b) food journaling, c) goals setting, and d) family involvement (Fitch & Brock, 2009). Results of a family-based randomized control trial by Epstein et al. (2011) showed improvement in overweight with increasing fruit and vegetable consumption in intervention group. Findings of this study showed a significant improvement in parents' percentage of overweight ( $p < 0.05$ ), and children showed a stable percentage of overweight over time.

**Multidisciplinary interventions:** Multidisciplinary programs have shown great improvements in children's BMI level, increased physical activity and eating habits, and usually have similar components (Ross, Kolbash, Cohen, & Skelton, 2010). These components focus on physical activity, nutrition and behaviour change. These interventions were designed for various settings such as family and home, schools, clinics, and weight loss camps (Golley, Perry, Magarey, & Daniels, 2007; Hughes et al., 2008; Kalarchian, et al., 2009; Nowicka, Lanke, Pietrobelli, Apitzsch, & Flodmark, 2009; Scharf & Stark, 2010; Skelton, DeMattia, & Flores, 2008; Woilford, Sallinen, Clark, & Freed, 2010). For instance, Skelton, DeMattia and Flores reported a significant ( $p < 0.005$ ) decrease in BMI z-score as a result of a family-based multidisciplinary weight management program which focused on nutrition and physical activity

education, training and support. Similarly the results of the multidisciplinary program by Chen, Weiss, Heyman and Lustig that involved parents, revealed a significant change in BMI, physical activity, fat consumption and fruit intake compared to pre-intervention measures ( $p < 0.05$ ).

As a result of these trials it became evident that family involvement in childhood obesity treatment was necessary and improved the chances of success in pediatric obesity treatment interventions.

## **2.5 Family influence on childhood obesity**

Family plays a vital role in the development of childhood obesity and its treatment. Eating and activity behaviours are modeled for children by parents (Patrick & Nicklas, 2005). Parental diet and inappropriate child-feeding behaviour may increase the chance of overweight and obesity in children (Clarke, Goyder, Bissell, Blank, & Peters, 2007). In addition parental obesity is another predictor of childhood obesity (Whitaker et al., 1997). Results from the study by Whitaker et al. reveal that having one obese parent increased the child's chance to become obese and parental obesity more than doubles the risk of adult obesity among obese and non-obese children less than 10 years of age. Additionally, maternal obesity was found to be a predictor of childhood obesity (Strauss & Knight, 1999). Moreover, obese children under three years of age without obese parents are at low risk for obesity in adulthood, but among older children, obesity is an increasingly important predictor of adult obesity, regardless of whether the parents are obese (Whitaker et al.). Family can influence successful weight reduction in multiple ways, including parental modeling of a healthy lifestyle and providing a supportive atmosphere (Clarke, Goyder, Bissell, Blank, & Peters, 2007). A number of family based weight management interventions have emerged in the literature

## 2.6 Family based interventions

Mind, Exercise, Nutrition, Do it! (MEND) is one such family oriented intervention. MEND components included: nutrition sessions, behavioural change and exercise sessions. Exercise sessions were designed for children only, whereas nutrition and behavioural sessions were designed for children and parents with a focus on healthy eating tips, healthy meal preparation, behaviour change, and goal setting. MEND was delivered biweekly in 9 weeks followed by 12 weeks of free family swim passes. In a randomized control trial of the MEND program, 117 children 7-13 year old were recruited by referral. Inclusion criteria for the study were BMI  $\geq$  98<sup>th</sup> percentile with no apparent clinical comorbidity, physical and learning disabilities (Sacher et al., 2010). The program was delivered in five different sites by different teams of health professionals. Assessment was done at baseline and participants were randomly assigned to control (56) or intervention group (60). The primary outcome was change in waist circumference from baseline to six months, whereas change in BMI and percent fat were secondary outcomes. Other measurements taken at baseline were: cardiovascular health, physical activity and inactivity, self-esteem and socioeconomic classification. At six months there was a significant reduction in waist circumference, BMI and fat mass, in the MEND group compared to the controls. Improvements were also seen in blood pressure, recovery heart rate, physical activity and self-esteem at 6 and 12 months. Mean attendance was 86% and the program was well accepted by children and parents.

A feasibility study of the MEND 5-7 program was conducted between 2009 and 2011 (Smith et al., 2013). The 10 week program consists of weekly group sessions. Each session consisted of four components: Power Time, Healthy Families, Active Play, and Parent Workshop. Participants were recruited between 2009 and 2011 and the eligibility criterion was a

BMI  $\geq$  91<sup>st</sup> percentile. Socioeconomic status, physical activity and inactivity, parenting efficacy, fruit and vegetable consumption were measured at baseline using standard procedures. Results showed a significant reduction in the primary outcome measure of BMI and secondary outcome measures including BMI z-score, waist circumference, and waist z-score, parenting self-efficacy, and fruit and vegetable consumption. The study shows that a community based multidisciplinary program can have positive effects on younger children's BMI and positive lifestyle change.

Kalarchian et al. (2009) evaluated the efficacy of a family-based treatment program for obese children 8.0 to 12.0 years of age. The program consisted of 20 group meetings during 6 months. Weekly goals were set after meetings and the intervention aim was to teach behavioural change and to increase physical activity, reduce sedentary behaviours, and healthy eating through goal setting. Adults were expected to model the healthy behaviours and set goals for physical activity. Six booster sessions were provided between month 6 and month 12. This study was a randomized, controlled trial conducted at the University of Pittsburgh Medical Center from March 2001 through May 2006. Inclusion criteria were: a) BMI  $\geq$  97<sup>th</sup> percentile, b) age between 8 and 12 years, and c) and having at least one adult willing to attend the sessions. Assessments were conducted at baseline, 6, 12, and 18 months. Adults and children randomized to the usual care (control) condition were offered two nutrition consultation sessions and were expected to develop a nutrition plan based on the Stoplight Eating Plan. Data analysis revealed a significantly greater ( $p = 0.0005$ ) decrease in the child percent overweight at 6 months in the intervention group (7.58%), but there were no significant differences between groups at 12 or 18 months. Small significant improvements in medical outcomes were observed at 6 and 12 months. Findings suggested that factors like having a lower baseline percent overweight; higher

attendance, higher income, and greater parent BMI reduction were associated with greater reduction of overweight in children at six months.

A single blinded, randomized control trial was used by Golley, Perry, Magarey, and Daniels (2007) to evaluate efficacy of two family based interventions; parenting skills training with intensive lifestyle education (P+DA) and parenting skills training only (P). A wait listed control group was used to compare the results of the two intervention groups. Parenting skills aimed to help parents to adapt a healthy lifestyle by participating in a Positive Parenting Program (Triple P). Triple P was based on child development and social learning theories and aimed to enhance parental competency to change physical activity and eating behaviors. In addition to Triple P sessions, parents in P+ DA group participated in seven sessions of intensive lifestyle support. Children also attended supervised physical activity to improve fundamental motor skills. Parents in the control group received a parenting skills pamphlet and were contacted by phone 3-4 times during 12 months. A primary outcome of the study was change in the BMI-z score which reduced by 9% in P+DA group, 6% in P group and 5% in the control group, although this apparent change was not statistically significant ( $p = 0.76$ ). BMI was increased at 12 months for 45% of children in the control group, 19% in P+DA and 24% in P group. In addition findings showed a gender effect where boys showed a higher reduction in percentage overweight compared to girls.

Boles, Scharf, and Stark (2010) developed and tested the feasibility of a study utilizing a home and clinic intervention called Learning About Activity and Understanding Nutrition for Better Child Health -LAUNCH) to reduce overweight in pre-school children. Five preschoolers (2-5 years) with BMI greater than 95<sup>th</sup> percentile and their families participated in the program. The program's aim was to reduce weight gain in overweight preschool children by improving

nutrition intake, increasing fruit and vegetable intake, reducing sugar beverages, and increasing physical activity. The program was 24 weeks and consisted of two phases. Phase I, Intensive Intervention, consisted of weekly sessions that alternated between group-based clinic sessions and individual home visits; and Phase II, Maintenance, was 12 weeks of every other week sessions, again alternating between group sessions in clinic and individual home sessions. Clinic sessions for parents had three themes: dietary education, physical activity education and parenting skill. The home sessions focused on supporting families to apply eating and physical activity skills they learned in clinic. Children and parents' height and weight were measured at baseline, 6 months, and 12 months. Children's dietary intake was assessed using standardized method. Similarly children's physical activity level and home food environment were measured using standard procedures. Secondary outcomes were about the child's eating behaviour and feeding attitudes, which were captured via self-reported questionnaires. Similarly, parenting style and dimensions as well as pediatric quality of life were reported by parents using standard questionnaires. Results of the intervention showed that program completers ( $n = 3$ ) had a decrease in BMI z-scores ranging from -0.18 to -0.99. Completer parents also had a reduction in percentage overweight of -10.56% to -13.70%. Moreover, treatment was also associated with a decrease in daily calorie intake in children.

A randomized controlled trial was conducted by Huges et al. (2007) to evaluate the effectiveness of a best-practice individualized behavioural program for treatment of childhood overweight, the Scottish Childhood Overweight Treatment Trial (SCOTT), in reducing BMI z-score compared to a standard care control. The intervention consisted of eight appointments and used a family-centered approach to achieve lifestyle changes. Various behavioural change techniques were used to motivate the child towards lifestyle changes, including: identifying the

barriers to change, exploring pros and cons of change, goal setting, rewards, self-monitoring, social support, and preventing relapse. The traffic light strategy was used to encourage children to change their eating habits, increase physical activity, reduce consumption of fat and sugar, and to reduce sedentary behaviours. Participants in standard care had 3-4 outpatient appointments delivered by pediatric dietitians during 6 to 10 months with a focus on dietary change with minimal focus on physical activity or sedentary behaviour. Results indicated that there were no significant differences between the intervention and control groups for changes in BMI z-score and weight (kg) from baseline to 6 and 12 months, whereas there were significant between-group differences for the change in total activity and sedentary behaviour and light-intensity activity from baseline to 6 months in favour of the intervention group. Additionally weight gain was remarkably lower in the intervention group compared with the control subjects from baseline to six months. The authors concluded that including physical activity and sedentary behaviour change in treatment had a positive effect on the outcome of the intervention.

Magarey et al. (2011) conducted a single-blinded randomized controlled trial of pre-pubertal moderately obese children, aged five to nine years. The aim of the study was to evaluate the effectiveness of a program utilizing parenting skill training to change BMI and waist circumference z score of overweight children. A parent only approach was applied to both intervention groups: the healthy lifestyle education with parenting skills training (P+ HL) and healthy lifestyle education without specific parenting skill (HL). BMI and waist z scores and parenting constructs were measured at baseline, 6, 12, 18, and 24 months. Results indicated that a 10% relative weight loss from baseline to 6 months was achieved at the end of intervention in both groups (6 months) and then maintained for an additional 18 months.

Adding to the evidence on the success of family-based interventions, Quattrin et al. (2012) tested the efficacy of an innovative family based intervention for overweight preschool children in a randomized control trial. The program consisted of 10 group meetings and 8 calls over 6 months. The primary focus of these sessions was dietary and physical/sedentary activities. As a result of the intervention, children enrolled in intervention group showed a greater reduction in % BMI and BMI z-score compared to the children in control group. Interestingly, a greater BMI reduction over time was also observed in parents in the intervention group compared with parents in control group.

Another family centered childhood obesity intervention was performed by engaging parents in program planning and implementation (Davison, Jurkowski, Li, Kranz, & Lawson, 2013; 2012). Program consisted of four components: 1) a health communication campaign to increase awareness about childhood obesity; 2) letters mailed to families to enhance parents' understanding of information provided; 3) informal nutrition counselling sessions; and, 4) a six week parent-led program to strengthen parents' communication skills, conflict resolution, resource-related empowerment for healthy lifestyles, social networks, and media literacy. The authors reported significant improvements in the rate of obesity, light physical activity, daily TV viewing, and dietary intake in children who completed the program ( $p < .01$ ).

The Watch It program was developed to address obesity in children among disadvantaged communities in Leeds (Rudolf et al., 2006). The program used a motivational approach to encourage behaviour change. The program consisted of: Individual appointments with parents and children for motivation and support, group activity sessions at local sport center, and group parenting sessions after reducing the frequency of individual appointments. Families committed to participation for three months with opportunity to renew it three times for a year. Eligibility

criteria for participants were age 8-16 and BMI above 98<sup>th</sup> percentile with fluency in English. Baseline data showed that children were moderately to severely obese, and had a lower self-image profile, and a lower self-esteem scores compared to a population of Leeds school children of the same age and sex. Results indicated that 54% of the children at three months and 71% at six months showed a reduction in BMI SDS score. The qualitative results indicated that program was successful in increasing children's self-esteem and self-confidence.

A family based intervention that focused on behavioural treatment of childhood obesity was reported by Janicke et al. (2011). Forty children with BMI over 85<sup>th</sup> percentile were enrolled in the program. Participants were randomized to group-based family intervention (BFI) or individual standard of care (ISC). The group based intervention (Behavioural Family Intervention-BFI) consisted of 12 weekly, 90 minute sessions. These sessions offered topics related to nutrition and physical activity. In contrast the individual session group participated in three 60 minute session over 12 weeks and met with a treatment team member. These sessions included information on dietary habits and exercise. Researchers hypothesized that the group based intervention will show a greater improvement in BMI z-score relative to the ISC group. Results of the study showed there was no difference in weight status outcomes for children assigned to the BFI relative to those in the ISC condition. Authors expressed that it was possible that poor attendance had a negative impact on effectiveness of the group program.

A mixed method study by Pinard et al. (2012) aimed to evaluate feasibility of a family based obesity treatment program for children in low income families (Smart Choices for Healthy Families). Participants were 26 children and their parents/care givers recruited through physician referral. Inclusion criteria were age of 8-12 years and BMI between 90<sup>th</sup> and 99<sup>th</sup> percentile for age and gender. Intervention provided support for parent behaviour change, parenting strategies

and role modeling to adopt healthy and physical activity behaviour. The 12 week program was delivered by two leaders, one to focus on delivery of program to children and the other focus on parents. Parent sessions had a focus on home environment and goal setting whereas children's sessions focused on physical activity. Finally in a joint child and parent session a shared activity and healthy recipe was completed with participants. Every other week participants received an ATC (Automated Telephone Call) consisting of participant's feedback on goal success and a review of the week. Children's height, weight, BMI, physical activity, parent physical activity and health behaviours were measured using standard procedures and tools. The primary outcome, BMI z-score, was significantly decreased at three months. Children also showed a reduction in consumption of sugar-sweetened beverages and parents showed an increase in vegetable intake.

Another family-based intervention which attempted to improve children BMI, self-esteem and depression symptoms in children, was a 12 week family based program for children age 7-13 (Danielsen, Nordhus, Júlíusson, Mæhle, & Pallesen, 2012). The sample consisted of 49 obese children and treatment included 12 weekly individual family meetings, and a booster session six months after the treatment. The aim of the treatment was to establish a balanced and healthy diet, increase physical activity, and reduce sedentary activity. In addition researchers aimed to develop family and individual coping skills and a positive self-perception. Results of the study showed a significant post intervention improvement to children BMI. However authors reported that reduction of BMI SDS at 12 month follow up was a small effect size compare to the previous treatment studies, which was further explained as a result of a less specialized treatment/healthcare approach in this study.

With a growing number of effective childhood obesity interventions, it is important for public health organizations and policy makers to understand which approach works the best. To find this, it is important to evaluate the program outcomes, barriers and facilitators associated with each program, its acceptability and feasibility. Considering that most of these interventions are performed in ideal and controlled conditions, their efficacy needs to be evaluated in real world settings and with real populations (Glasgow, Lichtenstein, Alfred, & Marcus, 2003). Implementation studies are a worthwhile approach to support scaling up program coverage and ensuring sustainability. Acceptability, adoption, appropriateness, feasibility, fidelity, and implementation cost, are all used to decide if implementation has been successful (Peters, Adam, Olakunle, Agyepong, & Tran, 2013). Frequently used research methods in implementation research are pragmatic trials, effectiveness-implementation hybrid trials, quality improvement studies, participatory action research, and mixed methods (Peters et al., 2013). Process evaluation is the term to describe implementation.

## **2.7 Process evaluation**

The concept of process or implementation evaluation is not new. A review of literature shows a number of articles that have addressed this concept under different names. In the 1960s an early definition of process evaluation was included in a text book on program evaluation (Suchman, 1967). In 1980, Green, Kreuter, Deeds, and Partridge defined process evaluation as a means to monitor the quality of practice and claimed that in a process evaluation the object of interest is professional practice. Starting in the mid-1980s was the beginning of contemporary process evaluation theory and methods (Steckler & Linnan, 2002).

### **2.7.1 Why a process evaluation?**

While the greatest focus in the literature is on outcome evaluations, to determine whether a program has been successful or not, it is equally important to conduct a process evaluation to understand why a program was or was not successful (Bartholomew, Parcel, Kok, & Gottlieb, 2001; Steckler & Linnan, 2002a).

Process evaluation is important to find out if a program is able to succeed in long term. It is critical that we have some measure of whether the program is working according to the plan. According to Fonseca-Becker and Boore (2008) process evaluation strengthens the program, satisfies donor requirements, helps in gaining additional funding, and influences policy. Moreover, findings of process evaluations can be used by a wide range of users. Users would be program sponsors, program directors, and perhaps program practitioners, and stakeholders. Evaluation may also serve a wide range of users beyond the immediate program such as: a) managers of similar programs in order to learn and improve their own programs; b) federal officials and foundation officers to make decision about funding and to improve the operation of programs they sponsor; c) policy makers to adopt amendments to existing policies or new policies; and, d) social scientists to see what new knowledge has accrued and incorporate it into theory (Weiss, 1998). According to Weiss, a quality process evaluation is required to inform the program users about the result of the program. There is a need for a clear communication with the program staff and users to understand and believe the findings.

It has therefore become important, as good research practice, to pair ‘process evaluation’ with an ‘outcome evaluation’ in the design of complex interventions (Oakley et al., 2006; O’Cathain, 2009). Process evaluation complements outcome evaluation by providing data to describe how a program was implemented, how well the activities delivered fit the original

design, to whom the services were delivered, the extent to which the target population was reached, and the factors external to the program that may compete with the program effects (McGraw et al., 1994). Evaluation studies need to address different dimensions of quality, therefore efficacy- based evaluations are not the most appropriate (Glasgow, Vogt, & Boles, 1999). One method to evaluate dimensions of both internal and external validity and to describe elements of study design is the RE-AIM framework (Glasgow, Vogt, & Boles, 1999). Several components of process evaluation have been identified in recent years (Baranowski & Stables, 2000; Linnan & Steckler, 2002). Linnan and Steckler identified seven core components of process evaluation (Table1).

Table1

*Components of Process Evaluation*

Component	Purpose
Context	The physical, social and political environment that affects the intervention
Reach	The degree to which intended population participate in intervention
Dose Delivered	Amount of intended intervention delivered
Dose Received	The extent to which participants received the intervention resources.
Fidelity	The extent to which program was delivered as planned.
Implementation	The extent to which intervention has been implemented
Recruitment	Procedures to attract and recruit participants

*Note.* Adapted from *Process evaluation for public health interventions and research* by Linnan and Steckler, 2002

Similarly Baranowski and Stables (2000) offered a list of 11 components of process evaluation. Recruitment, Reach, Contexts, Implementation, and Exposure (dose delivered), were in line with Linnan and Steckler's. They added the Resources, Barriers, Initial and Continued use, and Contamination.

### **2.7.2 Process Evaluation designs**

To design process evaluation research it is important to know what questions need to be answered. As described earlier measures like reach, acceptability, fidelity, efficacy, effectiveness, and maintenance have been proposed by different researchers as key constructs of process evaluation. The RE-AIM framework is a widely used evaluation tool which has been used in health promotion domain and represents these measures. The RE-AIM framework (Gaglio & Glasgow, 2012; Glasgow, Vogt, & Boles, 1999; Klesges, Estabrooks, Dzewaltowski, Bull, & Glasgow, 2005) has been used to evaluate, and review a large number of health promotion and disease management interventions (Gaglio & Glasgow; Glasgow, Klesges, Dzewaltowski, Bull, & Estabrooks). More than 150 published studies and number of grant applications state they have used the RE-AIM model (Gaglio & Glasgow, 2012). The RE-AIM framework is compatible with social-ecological model and focuses on of five dimensions of health promotion studies: Reach, Efficacy, Adoption, Implementation, and Maintenance (Glasgow et al., 1999). In addition RE-AIM provides a framework that gives stakeholders an idea about interventions worth sustaining and identifies the interventions that work in the real-world. RE-AIM can be used for evaluation of randomized controlled studies and other designs, and it is compatible with evidence-based medicine.

According to the RE-AIM framework it is important to evaluate the efficacy and impact of an intervention at the level of the individuals (Reach) as well as the level of organizations

levels. Evaluation of both levels is important because each offers valuable independent information of intervention impact. Following are the descriptions of the components in the RE-AIM framework.

**Reach:** Glasgow, Vogt, and Boles (1999) defined Reach as a measure of participation. This is represented as the percentage of population affected by the program or receiving the program. For this purpose information about the population should be obtained.

**Efficacy:** Efficacy has been defined as the outcome of the health promotion interventions including, health behaviors and participant centered quality of life measures. Glasgow maintains that it is important to report positive as well as negative outcomes of the intervention (Glasgow et al., 1999).

**Adoption:** The proportion and representativeness of the settings that have adopted the intervention is called adoption (Glasgow et al., 1999).

**Implementation:** Implementation is an individual-level as well as a program level measure. Implementation refers to the extent to which program was delivered. At program level, the level to which a program was delivered by staff defines implementation whereas at individual level measures of participant adherence to the regimen defines implementation (Glasgow et al., 1999).

**Maintenance:** A great challenge in health promotion interventions are maintenance of behaviour change at both the individual and program level. Maintenance measures how intervention has become a part of individual's or organization's behaviour (Glasgow et al., 1999).

Despite its encouragement to gather data on all five components, a study evaluating the external validity of 57 physical activity interventions using the RE-AIM framework found most of the studies reviewed focused on internal validity and statistically significant findings rather than on issues of external validity (Antikainen & Ellis, 2011).

### **2.7.3 Process Evaluation Studies**

A large body of evidence is available that demonstrates the efficacy of behavioural interventions on the treatment of childhood obesity. However, efficacy studies under controlled conditions are not sufficient to help public health decision makers and practitioners to judge the total effectiveness of the initiatives (Clarke, 1995; Estabrooks & Gyurcsik, 2003; Glasgow, Lichtenstein, & Marcus, 2003). While there are many studies that include evaluation of health promotion programs, not many have reported all of the process evaluation components discussed earlier. Efficacy and acceptability are the most reported dimensions in process evaluation studies. The following section describes childhood weight management studies and their use of process evaluation measures.

One example of studies that included a process evaluation was the feasibility study of the iStart Smart program. An evidence-based obesity intervention based on social cognitive theory and targeting Chinese American children in a community-based and primary care setting (Chen, Kwan, Mac, Chin, & Liu, 2013). iStart Smart components included: educational play-based activities to improve self-efficacy, critical thinking, and problem solving skills related to nutrition, physical activity, and coping. The intervention aimed to change health behaviours and maintain a healthy weight. The providers in a primary care clinic recruited overweight and obese children who met the inclusion criteria for an eight-week play-based childhood obesity intervention at a neighbouring community center. To demonstrate efficacy children's weight,

height, blood pressure and waist circumference were measured at baseline. The intervention group also completed questionnaires regarding dietary intake, self-efficacy, and physical activity at baseline, two months and six months post-baseline. To demonstrate feasibility, a 6-item and a 12-item program evaluation questionnaire were completed by children and parents respectively. The efficacy of the program was demonstrated by significant reductions in overweight and obesity, and improvement of knowledge and self-efficacy related to nutrition at six months post-baseline. The process evaluation showed high levels of attendance (90%) and acceptability to children and families. Approximately 70 % of children and 91 % of parents in the intervention group reported the program was fun or really fun, 79 % of children reported eating more vegetable and fruit, and 68 % reported being more active after joining the program.

A process evaluation of a program called the “Children’s Health and Weight Study” (CHeWS), was included in a study by Tyler and Horner (2008) called “Collaborating with Low-Income Families and their Overweight Children to Improve Weight-Related Behaviors.” The qualitative data to evaluate implementation were collected from the interactions among health providers, parents and children during the intervention. Researchers used a structured field-note to measure the fidelity and consistency in the delivery of the intervention. Researchers also randomly recorded some of the intervention visits. This evaluation indicated that families and children had great ideas about changing unhealthy lifestyles which needs to be directed by health providers. Some of the challenges and barriers identified by the process evaluation were: resistance to change, busy family routines, complex family relationships, financial issues and the impact of holiday on family lifestyle.

Foster et al. (2012) evaluated the effectiveness of a weight management program for children and teenagers as well as the implementation factor attendance. The design was a

single arm, pre-post, six month, family-based behavioural treatment. The program consisted of 12 face-to-face group sessions, 12 home sessions, and 12 facilitator telephone calls. Related to the measures of program efficacy, findings showed significant reduction in children weight and improvements in child health-related quality of life as reported by parents and children.

Regarding the implementation of the program researchers stated that program delivery in a community setting was feasible and acceptable and was successful in attracting children at high risk. Attendance was identified to be high (76%), and attrition was low (16%) at six months. Measuring program satisfaction showed that 61.2 % of the children and 66.6% of the parents were very satisfied with the program and almost all (94.7%) parents stated that they would recommend the program. Despite the fact that no formal cost analysis was conducted, authors suggested a few cost saving approaches including: running one group for children and parents instead of two separate groups, having fewer face-to-face sessions, and utilizing health promotion staff instead of specialists who are more expensive and fewer in number.

Another process evaluation was incorporated into the evaluation of two parent-led family-focused weight management programs by Golley, Perry, Magarey and Daniels (2007) which used a single blinded, randomized control trial. Parenting skills training with intensive lifestyle education (P+DA) and parenting skills training only (P) were compared to each other and a third control waiting list group (WLC). Parenting skills aimed to help parents to adapt a healthy lifestyle by participating in a Positive Parenting Program (Triple P). In addition to Triple P sessions, parents in P+ DA group participated in additional seven sessions of intensive lifestyle support. Children also attended supervised physical activity to improve fundamental motor skills learning. Parents in the control group received a parenting skills pamphlet and few phone calls. BMI as the primary outcome of the study was reduced by 9% in P+DA group, 6% in P group and

5% in control group. Attendance was tracked at more than three quarters in both P and P+DA groups. The process evaluation addressed barriers, quality of the program and level of participants' satisfaction. Data were collected using parent questionnaires. Some of barriers identified were: sessions timing or frequency, transportation and program not meeting their needs. Quality of the program was rated good to excellent by almost all participants. Most of the parents found the program very helpful and showed willingness to repeat the program if asked.

A mixed method study by Pinard et al. (2012) aimed to evaluate feasibility of a family based obesity treatment program for children in low income families (Smart Choices for Healthy Families). Participants were 26 children and their parents (care givers) and were recruited through physician referral. Intervention provided support for parent behaviour change, parenting strategies and role modeling to adopt healthy and physical activity behaviour. Researchers used the RE-AIM framework and reported information on reach, implementation and representativeness. Implementation was defined by program agents' fidelity to protocols. To measure this, a team member was present at each session to ensure the treatment fidelity. Reach was measured by calculating the ratio of eligible participants to the number of children identified to have the eligible BMI. Representativeness was measured by comparing participants who joined the program with the ones who declined.

A recent study aimed to assess feasibility and acceptability of a family based intervention to treat childhood obesity. The eligible families had children age 6 to 12 years with a BMI at the 85th percentile. The program was delivered in two versions of 12 and 16 weeks, with the same content (Riggs, Lozano, Mohelnitzky, Rudnick, & Richards, 2014). The focus of both interventions was nutrition, physical activity education and behavioural monitoring, goal setting, contingency management, environmental control, and relapse prevention. Qualitative data were

collected through interviews and questions focused on participants' perceptions, experiences, related to presence or absence of social support for making changes to their family's nutrition and physical activity habits. Quantitative analysis of the results showed an improvement in BMI Z-scores and parent-reported child quality of life. On the other hand, qualitative findings showed that families associated successful behavior change to the positive social support they got. In contrast families who failed to make these lifestyle changes found it to be associated with lack of positive social support.

Another study evaluated implementation of the WATCH IT program (Rudolf et al., 2006). During the 12 months of the evaluation 61 families participated in the program, eligibility criteria were age between 8-16 and BMI above 98 percentile. The program consisted of individual appointments, group activity sessions, and group parenting sessions. Process evaluation was used to assess implementation and user views. In evaluating implementation researchers documented the number of appointments made by participants vs cancelled appointments. Based on the outcomes of interviews and focus groups parents reported that WATCH IT made a difference in their children's self-esteem and self-confidence, and children reported a positive attitude towards the program.

A recent study by Welsby et al. (2014) performed a process evaluation of a community based obesity treatment program for children aged 7-13 years with a BMI greater than 85 percentile. Children were accompanied by their parent/caregiver to 20 bi-weekly sessions. The key components of the program were: physical activity sessions and behaviour change sessions including goal and reward setting, problem solving, triggers and role modelling. Authors reported reach based on absolute number of participants and representativeness of the sample. Dose was reported as number of sessions and attendance rates. Further, this process evaluation

also provided important information for program planning by addressing barriers and facilitators. Findings showed that despite the overall positive feedback from parents and children about the program, the twice a week time commitment was a major barrier.

A feasibility study by Arauz Boudreau, Kurowski, Gonzalez, Dimond, and Oreskovic (2013) aimed to assess both the feasibility and effectiveness of a family-centered, primary care-based weight management program. Forty-one Latino children with BMI >85%, aged 9-12 years, and their caregivers participated in the study. Intervention consisted of six weeks of interactive group classes followed by 6 months of culturally sensitive monthly in-person or phone coaching. The focus of these sessions was to empower families to make lifestyles changes through identifying both family and social barriers to making changes. Results showed an improved but non-significant, health related quality of life in both groups. No differences were found between intervention and control children for metabolic markers of obesity, BMI, or physical activity. In terms of process evaluation the authors reported a good attendance rate (79%) for each group on average and barriers to lifestyle change were identified as socio-environmental and family factors, along with knowledge. In conclusion researchers reported that Latino families were willing to participate in group based health classes. They further emphasized on the importance of community partnership to facilitate such programs.

A recent study used the RE-AIM framework to evaluate success and sustainability of a family-based program named “Strong Kids Strong Teens” (Grow et al., 2014). A large proportion of the study was dedicated to measuring efficacy by measuring change in health outcomes including serving of fruit and vegetables and milk consumption, PA level and BMI. In terms of program implementation, program feedback from families and staff were used to identify barriers. Based on these findings researchers introduced new strategies to improve

Reach by approaching more families compared to the previous cycle and adapting the program for Spanish speaking participants. By improving the curriculum and weekly goal settings efficacy was improved and statistically significant results in parent-reported home environment, child quality of life, child BMI z-score, and parent satisfaction were seen. In terms of implementation authors reported that all sites met the minimum standards for fidelity.

West, Sanders, Cleghorn, and Davies (2010) evaluated the effects of a lifestyle-specific parenting program in a randomized control trial for treatment of childhood obesity. The 12 week intervention for 4 to 11 year olds aimed to improve dietary habits and physical activity of the children and promoting healthy lifestyle for families. In addition to the primary outcomes (BMI z-score and parenting self-efficacy) authors also reported program adherence and participant satisfaction as measures of program quality. Parents who participated in the intervention reported high levels of satisfaction ( $M = 78.46$ ,  $SD = 7.18$ ). Results from Content checklists showed 98.23% self-reported compliance and 98.42% observer-rated compliance with the intervention protocol.

Finally, a randomized control trial was registered by Robertson et al. (2013) that aimed to measure effectiveness and cost- effectiveness of a 12 months childhood obesity treatment program. The study design is a multi-centered, randomized parallel group control trial with parallel economic evaluation and 12 months follow up (Robertson et al., 2013). Measures were taken at baseline and will be taken at 6 and 12 months. The process evaluation will focus on: recruitment, reach, dose delivered, dose received, and fidelity and qualitative data will be collected using questionnaire completed by children, parents and facilitators at 12 months.

As seen in the studies above, across all the evaluation studies measures of internal validity, such as effectiveness and intervention delivery were reported more consistently

compared to the measures of external validity. Information about representativeness of the sample (participants) and generalizability of the study were lacking and only a few studies reported the extent to which treatment effects were maintained. Measures of reach and recruitment issues were addressed in some of the studies however most of the studies lacked information about characteristics of the participants and dropouts. Some of the studies have reported acceptability as a result of high attendance and participants' satisfaction with the program. Implementation was addressed in the majority of the studies and issues like program delivery, quality, and cost effectiveness were measured. As mentioned previously, identifying barriers and facilitators in evaluation studies is important for dissemination of the study in real world setting. Accordingly some of the evaluation studies have reported barriers and facilitators using interviews, surveys and other qualitative methods.

## **2.8 Summary of the findings**

Among treatment approaches addressing childhood obesity, multidisciplinary programs with involvement of family have shown a positive effect on treatment of childhood obesity and reduction of BMI. Most of the studies have focused on older children and few have addressed this issue in younger children, therefore this research aims to help younger children aged five to seven years and their families to adopt a healthier lifestyle through healthy eating and physical activity. As MEND 5-7 was delivered in Canada for the first time, a process evaluation was required to evaluate the feasibility of the initiative in the Canadian context.

Some of the important measures of process evaluation such as implementation and fidelity, were not well reported in feasibility and evaluation studies of childhood obesity, therefore we used RE-AIM framework to ensure that issues related to Reach (awareness, and

access), Effectiveness, and Implementation (barriers and facilitators, acceptability, and fidelity) were addressed.

### 3 Methodology

#### 3.1 Research Design

This study was a descriptive/exploratory case study (Yin, 2000), incorporating mixed methods (Hanson, Creswell, Clark, Petska, & Creswell, 2005), with equal weighting given to quantitative and qualitative data. The study utilized RE-AIM as an organizing framework for data collection. *The RE-AIM<sup>1</sup> model* has five key components that are detailed for the purposes of enhancing the evaluation and uptake of public health interventions:

- **Reach;**
- **Effectiveness or efficacy;**
- **Adoption by target settings or institutions;**
- **Implementation, consistency of delivery of intervention;**
- **Maintenance of intervention effects in individuals and settings over time.**

This case study focused on reach, efficacy and implementation.

#### 3.2 Ethics

Ethics approval for this study was obtained from University of Victoria Human Research Ethics board. Informed consent was obtained from both staff and the parents and assent was obtained from the children after they were provided with information about study objectives, by both mail and in person (Appendix B).

---

<sup>1</sup> <http://www.re-aim.org/>

### **3.3 Participants**

Participants were MEND leaders and administrators, as well as parents of children aged 5-7, male and females, of various race and ethnicities. Inclusion criteria for the children was BMI>85%, with no apparent clinical problems, comorbidities, physical disabilities, or learning difficulties which would interfere with learning and physical activity sessions. The inclusion criterion for parents was willingness to attend MEND sessions. Staff must have been involved in delivering the MEND program to be included in the study. Initially a total of 27 children were recruited across three delivery sites, 26 met the eligibility criteria, 24 children and their families were enrolled in the program, only 21 provided baseline data and only 18 completed both pre and post physical measurements.

### **3.4 Recruitment**

Recruitment was conducted through posters, newsletters, social media, local media, physician and health professionals' referrals, and community presentations.

### **3.5 Intervention**

MEND 5-7 is a multicomponent healthy lifestyle program based on the principles of healthy nutrition and physical activity. The program engages families in the process of weight management by addressing three components necessary for individual-level behavioural change: a) education, b) skills training, and c) motivational enhancement, while retaining a systemic understanding of the need to engage multiple, interacting systems of influence within the family context. The program consists of one group session (1 hr 45min long) per week delivered over 10 weeks. The sessions are comprised of an introduction meeting, sessions focusing on behaviour change, eight sessions providing nutrition education, physical activity sessions and a closing session. Sessions were delivered by a MEND program leader and one assistant to groups of 24 children and their accompanying parents and siblings in community recreation centers.

**Nutrition sessions:** Sessions on nutrition education are 20 minutes long and consist of healthy eating advice customized for obese children and including healthy eating tips in the form of achievable weekly targets, instructions on the reading and understanding of food and drink labels and other simple advice designed to produce gradual changes in dietary habits. In addition, sessions include preparation of healthy meals and fruit and vegetable sampling.

**Behaviour change sessions:** These 25 minute sessions focus on teaching parents and children to apply behavioural techniques such as: stimulus control, goal setting, reinforcement, and response prevention to establish a health-promoting home environment.

**Exercise sessions:** All sessions include one hour of exercise for children only. Exercise sessions include multi-skill activities focusing on noncompetitive group play. The CATCH Kids Club curriculum is used for the exercise component.

**Parent workshops:** These weekly one hour sessions for parents focus on educating parents about: healthy growth in children, family physical activity, regular eating and healthy habits for children, and serving sizes for family. These sessions start with a group discussion to review family's weekly goals and challenges.

### **3.6 Procedures**

Collection of quantitative data, including measures of anthropometry and lifestyle behaviours, took place at baseline and ten weeks following the implementation of the MEND intervention. In order to maintain consistency in measuring, the same research assistant performed all of the measurements at week 1 and week 10. All measurements were taken in community recreation centers. The purpose of the qualitative evaluation was to understand participants' views on efficacy, reach, and implementation. Qualitative data were collected through various instruments including parent surveys, internal stakeholders' interviews, session

feedback forms, and recruitment strategy forms. Collection of qualitative data from program participants and leaders took place at the community recreation centers whereas stakeholder interviews were collected through telephone interviews.

### 3.7 Instrumentation

Instruments presented in this section were used to collect quantitative and qualitative data related to reach, effectiveness and implementation of MEND 5-7. Table 4 provides description of these data collection instruments.

Table 2

*Instruments Used for Measuring Reach, Efficacy, and Implementation of MEND 5-7*

Variable	Instrument
Reach	MEND registration tracking tool, recruitment strategy form, and internal stakeholder interview schedule.
Efficacy	Parents surveys, quantitative data from pre and post program measurements, and stakeholders' interview
Implementation	Stakeholders interview, Parents surveys, Recruitment tracking forms, session feedback forms, and site visit forms

#### 3.7.1 Reach

In order to evaluate reach, the following instruments were used to measure representativeness of the sample, and attendance and retention.

##### *Demographic data:*

The social data questionnaire consisted of multiple-choice questions that collected information about social demographic data and was completed by parents or caregivers at the first measurement session before the intervention starts (MEND, 2014). Demographic data

included the age of the child and adult, their gender, education level of the parents, and social data of the parents. These details provide information about the range of people participating in MEND programs. This information was also used during data analysis (Appendix C).

#### *MEND registration tracking tool*

This form was used to track inquiries about the program, how many of those inquiries were eligible and to keep track of attendance and reasons for absence. The registration tracking tool was completed weekly by the MEND programmer in each delivery site.

#### *Recruitment strategy form*

This form was filled out by programmers to record the recruitment strategies used each week to identify effective recruitment and advertising strategies. These forms were completed weekly from the time staff started recruitment at each MEND delivery site. These forms specifically asked about where, when and by whom the strategy was performed.

#### *Internal stakeholder interview*

Following the delivery of 10-week MEND program local delivery team staff were invited to participate in stakeholder interviews in person or via telephone to provide their insights about program processes and implementation of MEND 5-7.

### **3.7.2 Efficacy**

#### *Anthropometry- Child*

Child's height was measured using a portable stadiometer, and weight was measured using a digital electronic scale. Measurements were taken in the first and last sessions of the MEND program by the program leader and/or program assistant. Body Mass Index (BMI) was calculated from a child's weight and height using the following equation:

$$\text{BMI} = \text{Weight (kg)} / [\text{Height (m)}]^2$$

The BMI was then plotted on age and gender-specific growth charts. The position of the point on the graph indicated the child's weight status (underweight, healthy weight, overweight, and obese). BMI Cut-off points differed according to age and gender therefore we used BMI growth charts for children (Body mass index reference curves for the UK, 1990). BMI is a useful measure when looking at a child's change in weight status over a few months. However, over a period longer than a few months it is important to take into account changes that naturally occur as a child gets older.

BMI z-scores (also known as standard deviation scores) are another way of measuring whether a child's height and weight are in proportion. They were calculated using the 1990 UK child growth charts, and are a numerical expression of how a child's weight status has changed in relation to the expected changes due to growth.

#### *Anthropometry- Parent*

Parent's height was measured using a portable stadiometer, and weight was measured using digital, electronic scales. Measurements were taken in the first and last sessions of the MEND program by the program leader and/or program assistant. Body Mass Index (BMI) was calculated from an adult's weight and height:

$$\text{BMI} = \text{Weight (kg)} / [\text{Height (m)}]^2$$

#### *Physical activity and sedentary behaviour questionnaire*

To assess physical activity a physical activity questionnaire was administered to parents/primary caregivers (adapted from Slemenda et al., 1991). This questionnaire consisted of four sets of recall questions about their child's: a) outdoor playtime, b) playtime, c) TV time and computer game time, and d) their child's physical activity level (Appendix E).

### *Eating habits*

The MEND 5-7 nutrition questionnaire was designed by MEND and completed by parents or caregivers. Questions captured information on various aspects of the child's diet including the frequency of consumption of healthy and unhealthy food items, the child's behaviour around food, and at mealtimes, and the parent's knowledge of food labels.

### *Strength and difficulties questionnaire*

The Strengths and Difficulties Questionnaire (SDQ) consists of 25 statements related to behaviours associated with emotional distress in children (Appendix G) The questionnaire asked parents to indicate how 'true' the statements were of their child. An overall total difficulties score was generated with higher scores indicating increased difficulties (Goodman, 1997).

### *Parenting questionnaire*

A questionnaire was completed by parents and caregivers to evaluate parenting style (Appendix H). The questionnaire used a 10 point scale and addressed parents 'discipline' and boundary setting, time spent in play and enjoyment with their child, and parenting skills learning and knowledge.

### *Self-reported changes*

The program feedback questionnaire asked specific questions about changes that the family had made after participating in the program. The following questions were used to explore the changes in knowledge, behaviour and relationships as a result of participation in MEND. The following statements were rated on a five point scale (see appendix I, part A):

- MEND 5-7 changed how I introduce new foods;
- Helped me understand appropriate serving sizes for my child;
- Helped my family build healthy eating into the daily routine;

### **3.7.3 Implementation**

#### *Parents' perceived facilitators and barriers*

The program feedback questionnaire went beyond satisfaction with the MEND content and delivery and its impact on health behaviours to also asking about facilitators and barriers to program implementation. This questionnaire consisted of five open ended questions asking parents about the factors that made participation it either easy or difficult for them and asked about desired changes that may facilitate program participation (Appendix I, part F).

#### *Parent Satisfaction survey*

Parent and caregiver overall program satisfaction and the content was recorded using the Parent satisfaction survey summarized in Appendix H. Some of the key questions were:

- 1) Did the program improve your relation with your child?
- 2) Did MEND 5-7 help you and your child understand healthy eating?

#### *Child satisfaction Survey*

Parents rated their child's overall experience and satisfaction with MEND program using a five-point scale (Appendix I, part D). The survey addressed the level of child's enjoyment in MEND 5-7 program and whether the child had a good experience working with the MEND facilitators.

#### *Facilitator Group Session Feedback Form*

This instrument was used to collect information regarding program fidelity. Specifically the facilitators had to report on use of each of the planned components of the program such as the planned discussions, activities and theme of the session. The facilitator was asked to select the activities and discussions from the list that were covered during the session and report the reason for anything being missed.

### *Site visit forms*

To evaluate program fidelity the MEND regional coordinator completed one site visit per term and the regional coordinator attended one session during the program term and recorded information about if the program was delivered as intended.

### *Quality Assurance Forms*

Information regarding program quality was also collected using the site visit forms. The regional coordinator attended one session during the program term and recorded qualitative information about the following dimensions: a) health and safety at the MEND site, b) program structure, c) theory content, d) theory leader communication, e) theory leader facilitation skills, and f) delivery of goal setting component.

### *Training Program Evaluation Form*

A form was completed by MEND staff to evaluate quality of the training provided. They completed five questions that rated the delivery of the information, visual presentation of information, and MEND resources on a scale of one to four. (Appendix J)

### *Relevance Questionnaire*

Families were asked to rate the suitability of the MEND program in their community on a scale of one through five, with five being the highest suitability (Appendix A, part E) to following questions:

- 1) Was MEND appropriate for your family's financial situation?
- 2) Was MEND appropriate for your community?
- 3) Was MEND program suitable for Canadians in general?

### **3.8 Data Analyses**

Data from the stakeholders' interview and parents/caregivers surveys were used to assess feasibility of MEND 5-7. As this was a mixed methods descriptive/exploratory case study, both qualitative and quantitative data were analyzed concurrently and integrated during the interpretation phase (Hanson et al., 2005).

#### **3.8.1 Quantitative data:**

All quantitative data were exported from surveys to the Operational MEND Management System (OMMS) and into SPSS version 22.0 (SPSS, 2013) for analysis. A repeated measures t-test was used to examine differences across pre and post intervention height, weight, weight circumference and BMI. In addition, descriptive data for the post-program self-reported change questions were generated from the parent survey data and results were analyzed in Excel. A Fischer's exact test was used to examine the impact of the intervention on the proportion of children consuming water. A Wilcoxon paired test was performed on those variables that were not normally distributed according to the Kolmogorov-Smirnov test or where numbers were smaller than 20 on both pre and post measures. In these cases, the results are presented as the medians, Q1 (25<sup>th</sup> centile), Q3 (75<sup>th</sup> centile) and median changes.

#### **3.8.2 Qualitative data:**

Interviews and focus groups were audiotaped and audiotapes were transcribed verbatim. Content analysis of the interview transcripts was done using NVivo qualitative software to identify general categories and themes. Once themes were identified, the RE-AIM framework was used to organize the themes related to process evaluation.

## 4 Results

This chapter is divided into three sections based on the components of RE-AIM. In the first section results related to reach are displayed. The second section includes both quantitative and qualitative data analyses related to efficacy. Finally the third section describes the main themes and categories related to program implementation that emerged from the analysis of qualitative data.

### 4.1 Descriptives

Table 3 describes the demographics and the characteristics of the participants in detail and Table 4 describes the general characteristics of program completers. Of note 50% of the children enrolled were normal weight, 23% were overweight and 27% were obese.

Table 3

#### *Demographic / Family Characteristics of Participants*

Gender	N = 22/ (%)	BC data
<i>Girls</i>	9 (41%)	-
<i>Boys</i>	13 (59%)	-
Single-Parent Families		
<i>No</i>	16 (73%)	-
<i>Yes</i>	5 (23%)	-
<i>Missing</i>	1 (5%)	-
Race/Ethnicity		
An Aboriginal person	2 (9%)	4.8% <sup>1</sup>
Chinese	2 (9%)	10% <sup>1</sup>
Filipino	1 (5%)	8.7% <sup>1</sup>
Mixed	1 (5%)	-

Other	1 (5%)	-
White	14 (64%)	-
Missing	1 (5%)	
Primary Earner Status		
Employed	20 (91%)	59.7% <sup>3</sup>
Unemployed – currently not looking for work	1 (5%)	
Missing	1 (5%)	
Household Income Per Year		
Less than \$28,000	3 (14%)	51% <sup>1</sup>
\$28,000 to less than \$34,000	4 (18%)	-
\$34,000 to less than \$41,000	1 (5%)	-
\$47,000 to less than \$53,000	1 (5%)	-
\$53,000 to less than \$59,000	2 (9%)	24.5% <sup>1</sup>
\$59,000 or more	9 (41%)	-
Missing	2 (9%)	-
Highest Level of Education		
Bachelor's degree	3 (14%)	1.4% <sup>2</sup>
Finished grade 10	1 (5%)	-
High school certificate	3 (14%)	24.8% <sup>2</sup>
Non university certificate or diploma from a community college	6 (27%)	-
Trade certificate or diploma from a vocational school or apprenticeship training	4 (18%)	11.7% <sup>2</sup>
University certificate below bachelor's level	2 (9%)	6.1% <sup>2</sup>

University degree or certificate above bachelor's degree	2 (9%)	2.5% <sup>2</sup>
Missing	1 (5%)	
Family Structure	Mean	
Adults (n = 21)	1.9	-
Children (n = 21)	2.1	-

*Note.* The demographic data presented in this section is based on participants who have completed pre-test measures, <sup>1</sup>Data source: 2006 census, Statistic Canada, <sup>2</sup>Data source: Statistic Canada (2011), <sup>3</sup>Labour Force Statistics (2014)

Table 4

*Participant Profile for Families and Children that completed both pre and post test Measurements*

<b>Variable</b>	<b>N</b>	<b>%</b>
Gender (% Boys)	18	67
Ethnicity (% White)	18	61
Healthy weight children (%)	18	50
Overweight children (%)	18	28
Obese children (%)	18	22
Primary earner unemployed (%)	18	0
Single parent (%)	18	17

## 4.2 Reach

Research question one addressed the extent to which the MEND program was able to reach the eligible target group. Measurement of reach included exploring: a) recruitment strategies used by staff, b) the percent of those that responded to the recruitment that were registered, c) parent perceptions of accessibility, d) representativeness of the sample, and e) attendance and retention.

### 4.2.1 Recruitment

The most used recruitment strategies were implemented through a) leisure centers, b) current MEND participants, c) schools, and d) the internet. Figure 1 displays the various recruitment strategies used by MEND centers. Following recruitment, 10% of the families who contacted the program were enrolled in the program.

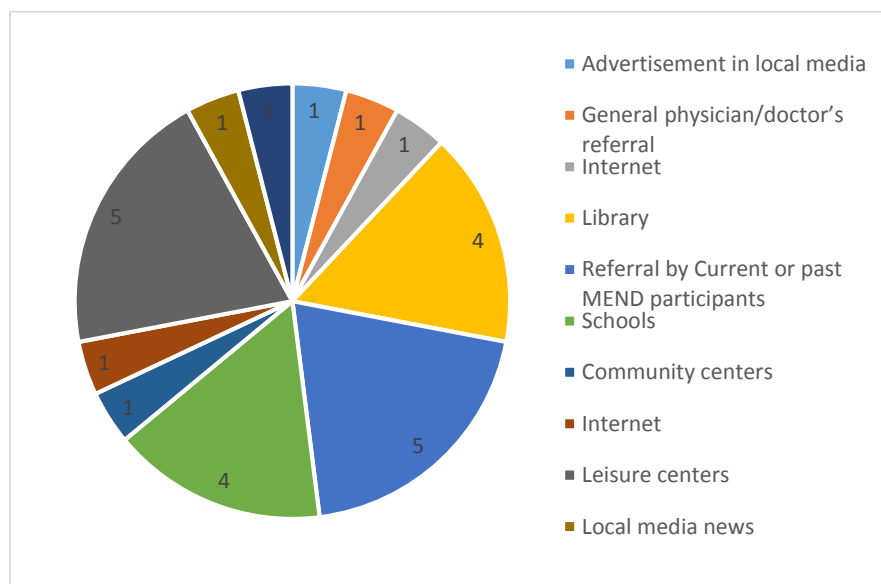


Figure 1. Recruitment strategies used in three MEND delivery centre

### 4.2.2 Attendance and Retention

The overall participant retention within the program was high (86.3%) and the attendance rate was also high (see Table 5). The total number of the participants enrolled in the study was 24. All participants completed the baseline measurement. Dropout rate was low (18%) and the numbers are displayed in Table 5. The reasons for dropout were: change in family circumstance and others (e.g. child wanted to play in neighbourhood with friends).

Table 5

*Measures of Attendance and Dropouts Using Registration Tracking Forms*

N (%)	Variables
7 (35%)	# (%) of participant who attended 100% of sessions
15 (75%)	# (%) of participant who attended 80% of sessions or more
19 (95%)	# (%) of participant who attended 70% of sessions or more
3 (1 & 2)	# dropouts (# boys & # girls)

*Note.* Attendance was calculated excluding children classified as drop-outs.

Dropout definition: a child who has attended < 2 of the 10 sessions inclusively.

### 4.2.3 Accessibility

Families indicated that MEND was accessible. The most prevalent factors identified by parents as having facilitated participation were: a) no cost, b) the inclusion of siblings c) being a family program, and d) the location. On the other hand, barriers to participation were a) time, b) length of the sessions, and c) the length of the commitment. According to the parent survey 80 percent of the participants definitely found the location easy to access and 85 percent of the families found the location perfectly suitable for program delivery. Figure 2 displays the data on accessibility.

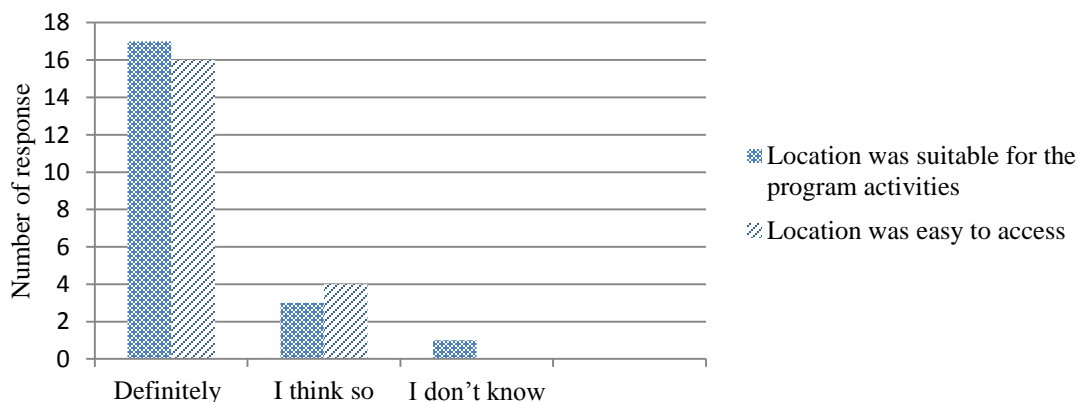


Figure 2. Accessibility of the program reported by parents through parent feedback forms

#### 4.2.4 Representativeness

Representativeness of the sample was calculated from the percentage of the intended population that were reached by the program. Table 6 displays demographic/characteristics of the MEND participants. When compared to the demographics of British Columbia (where possible to compare), it appears that the sample was a fair representation of general population with various ethnicities and SES. As shown in Table 6, the sample was not large enough to represent the population adequately for generalization.

Table 6

*Representativeness of the Sample Measured By Number of Targeted Population and Enrolled Participants*

	Estimated number of Overweight and obese children (aged 5 - 7 )	Number of participants	Representativeness
City #1	605	4	0.66%
City #2	352	11	3.12%
City #3	789	9	1.14%

### 4.3 Efficacy

#### 4.3.1 Anthropometry and Behavioural Changes

Research question two addressed the efficacy of the intervention or the ‘impact’ of MEND 5-7 on selected health outcomes; anthropometrics (BMI, waist circumference) and behaviours of the children and the families (nutrition, physical activity, psychological and parenting self-efficacy). The analysis of the pre and post growth check (anthropometric) and behaviour surveys is shown in Table 7. A thematic analysis of qualitative data obtained from

parent feedback surveys provided further information on self-reported changes that families made after enrolment in MEND 5-7 program.

Table 7

*Changes in Anthropometry, Physical Activity, Dietary habits, Psychological, and Parenting Self-Efficacy after Participation in MEND*

	N	Before MEND		After MEND		Before vs. After MEND		
		Mean (Median)	SD (Q1 / Q3)	Mean (Median)	SD (Q1 / Q3)	Change	CI	p-value
<b>Anthropometry</b>								
Child BMI (kg/m <sup>2</sup> )	*18	(16.9)	(16.2-19.3)	(17)	(16.1-19.3)	(0.1)		.4
Child BMI z-score	*17	(1.31)	(0.66-1.89)	(1.17)	(0.68-2.10)	(-0.14)		.6
Child waist circumference (cm)	*17	(58.4)	(53.7-62.5)	(57.5)	(55-65)	(-1.1)		.4
Parent BMI (kg/m <sup>2</sup> )	15	31.3	7.2	31.3	1.7	0.0	[-0.3 - 0.4]	.8
<b>Dietary Habits</b>								
Children's vegetable and fruit consumption (servings/day)	*18	(3.50)	(2.00-5.00)	(4.25)	(3.00-5.00)	(0.75)		.1
Parents' vegetable and fruit consumption (servings/day)	*17	(3.00)	(2.00-5.50)	(5.00)	(3.50-6.50)	(2.00)		.009
<b>Physical and Sedentary Activity</b>								
Time spent in indoor and outdoor active play (hours/week)	18	24.5	13.9	29.8	14.8	5.4	[-2.8 - 13.5]	.2
Time spent in indoor active play (hours/week)	18	4.0	2.7	3.7	2.4	-0.3	[-1.2 - 0.5]	.4
Children's screen time (hours/week)	*18	(13.7)	(10.5-22.5)	(10)	(5.3-16)	(-3.7)		.002
<b>Psychosocial</b>								
Strengths and difficulties questionnaire (0-40)	17	11.1	3.6	9.1	4.5	-1.9	[-4.1-0.2]	.07

Parenting self- efficacy								
Play and enjoyment (0-60)	*18	(54.0)	(40-56.3)	(54.0)	(47.8-57)	(0)		.05
Discipline and boundaries (0-60)	*18	(45.5)	(34-50)	(45.5)	(35-52.3)	(0)		.2
Learning and knowledge (0-60)	18	47.9	8.4	49.7	7.6	1.8	[-0.9 - 4.5]	.2

*Note.* \*Variables indicate that either pre or post metrics were non-normally distributed according to the Kolmogorov-Smirnov test. Since numbers were smaller than 20 on all occasions, for these variables a non-parametric Wilcoxon paired test was performed. In these cases, the results are presented as the medians, Q1 (25<sup>th</sup> centile), Q3 (75<sup>th</sup> centile) and median changes.

As shown in Table 7 there were no significant changes in anthropometric measures following participation. Also there were no significant differences in water consumption, children's fruit and vegetable consumption, the time spent active outdoors and indoors, parental efficacy related to discipline/ boundaries or learning and knowledge. There were significant changes in parent vegetable and fruit consumption, children's screen time, and parent's self-efficacy related to engaging in play. Two of the variables appeared to change substantially; time spent outdoors went up by 5.4 hours per week, and children's fruit and vegetable went up by 0.75 a serving. However, possibly due to small numbers and high variability, these changes were not statistically significant.

#### **4.3.2 Self-reported changes**

Impacts of the study were also measured through self-report parent surveys. Analysis of the survey data (shown in Figure 4) demonstrated the positive impacts of the program on families' nutrition behavior and physical activity practice. For instance 80% indicated they gave their children a wider variety of fruit and vegetable.

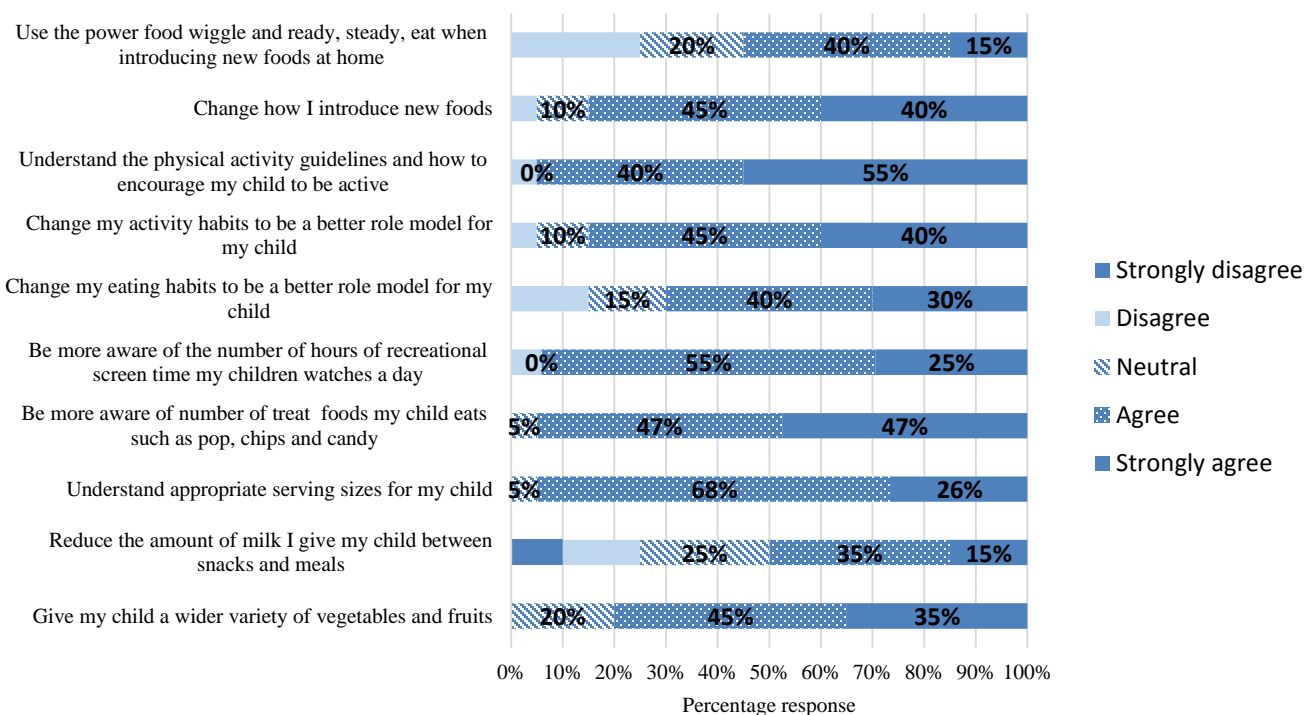


Figure 3. Parent-reported behaviour changes via parents' survey

### 4.3.3 Qualitative Themes related to Impact

As a result of the qualitative analysis of interview transcripts from program staff and family feedback forms three distinct themes emerged: a) new learnings, b) spending more family time, and c) kids having fun. The New Learnings theme included three additional sub-themes. These are summarized in Table 8 capturing how and why MEND contributed to the positive impacts of the program on family health behaviour. Furthermore, staff reported a high degree of engagement from participants and families were found eager to implement the program at home.

Table 8

#### *Qualitative Themes and Subthemes Related to Program Impact*

Themes	Sub-themes	Sample quotes
New Learnings	Trying new foods	One of our little boys had a carrot for the first time and he's 5 years old and he loved it and his mom was like he's never touched a carrot before. [Staff]

---

	After participating in MEND we increased introducing new foods. [parent]
Learned about nutrition	<p>I make more conscious choices about the food my family eats. [parent]</p> <p>For parents I don't think visually before the program they weren't able to recognize what a proper serving size looks like for children that age. [staff]</p>
Learned about physical activity	We learned how much physical activity we as a family need to do. [parent]
Spending more family time	<p>Active play with kids after dinner our new routine![parent]</p> <p>As parents we are trying to sit with kids while they eat; trying to eat as a family; trying to get outside to play with my kids.[parent]</p>
Kids having fun	Every time they come back from the gym and, this was the room we used for workshops and healthy families, they would come back and their little cheeks are red and big smiles on their face, ah they had fun [staff]

---

As shown in Table 8 the themes exemplify the positive impacts of the program on family eating behaviour, and physical activity.

#### 4.4 Implementation

A major part of the implementation evaluation was collected through stakeholder interviews and parent and leader session feedback forms. Analysis of the qualitative data

resulted in three distinct categories of implementation themes: a) Facilitators, b) Barriers, and c) Resources. Fidelity of the program delivery was also analysed.

#### 4.4.1 *Facilitators*

Six themes were identified by participants as implementation facilitators and are shown in Table 9.

Table 9

*Summary of the Themes and Subthemes Related to Facilitator Reported by Staff via Interviews*

Theme	Sub-themes	Sample quotes
Support	Support from team members	Support, and encourage one another throughout the program helped. [staff]
	Support from regional coordinator	Having somebody to always go back to with questions was very helpful. [staff]  I think we would have felt a little isolated a little out on our own she was the one that kept us tagged in with everybody else in the province. [staff]
	Support from other centers	Networking worked well.it helped each community support each one. I personally emailed or phoned other people about few things. [staff]
Teamwork	Communication within the group	Communication was really the key, within the group. [staff]
	Having a good team	I think choosing the right people for delivering this type of program is probably one of the most important things from what we have seen. [staff]
Flexibility	Creativity	I brought in real, packaged products for the parents to practice their label-reading skills. It was a hit! [staff]
	Adaptation	I mean just in terms of adaptability that was the name of our game, we pulled on what we had

		here if the weather was nice we would try to incorporate something outside. [staff]
Participant engagement	Parent participation	Comfort level is great. Parents are more eager to discuss their issues. There is now a level of trust between parents. [staff]
	Highly motivated kids	Great kids, kids were engaged and were excited to go to the gym. [staff]
Community relations		It's one of the advantages that we have here in this setting is connecting with kids in our summer programs for sure and getting the word out, and the age group. [staff]
Preparation and Planning		The preparation ahead of time that allows all 3 of us to be creative and jump off from that point and take it where it needs to go. [staff]
		We would take an hour and half for setting up, we would be planning, we would be talking and that was our main time to think what is today going to look like! You know, little planing as a group! That was probably our most productive time. [staff]

#### 4.4.2 **Barriers**

Based on stakeholder interview transcripts and participant feedback forms six main categories of barriers were identified. Time was the most prevalent barrier cited and was coded 15 times across 4 different data sources. Time issues discussed by participants were: duration of the sessions and the hour and day of program delivery sessions. Similarly, lack of preparation time was identified by staff as a critical barrier.

Recruitment was another major barrier for program delivery. All the staff across three sites agreed that recruitment was a challenge. They reported difficulties advertising the program

in summer when families have other plans and priorities. Punctuality was identified by staff as an additional issue. This appeared to be due to other priorities that the families had. Further, parental involvement was also a challenge and later in the program lack of interest from some of the parents and presence of dominant parents was highlighted.

Table 10

*Summary of the Subthemes Related to Barriers that Emerged from Staff Interviews and Parents Feedback Forms*

Themes	Sub-themes	Sample quotes
Time	Time of the sessions	The time of day was a challenge (5:30). It was a challenge to have a meal and make it on time. [parent]
	Lack of preparation time	Another issue we had was the prep time. As a theory leaded I was given only an hour prep time. [staff]
	Length of the sessions	A challenge I think was long hour in gym with 5 years old, they wanted to be with parents. If the activity sessions could be 45 minutes rather than 1 hour. [staff]
	Punctuality	One of the problems with us was punctuality, like being here on time. [staff]  I felt like if they were all on time, we could have probably made a better use of time and maybe have the extra 15 minutes with the kids in the gym, we could have had extra 15 minute discussion with parents. [staff]
Recruitment		Recruitment was difficult, getting enough families, in case some families drop out. [staff]
		Recruitment was challenging. [staff]

Parental involvement	Getting the parents to buy in as much as the kids was a little bit of a challenge, but it made it interesting for me actually. [staff]				
Location	One day area around the building was very busy due to a soccer tournament so the bingo walking was a little chaotic. [staff]  Chaotic in room with many different things happening at once. [staff]				
Lack of flexibility in manual	The workshop manual lay out is literally like a script. It's pretty impossible to follow that just because you're not a computer standing talking in front of the group. [staff]				
Diversity	<table border="0"> <tr> <td data-bbox="461 1058 688 1092">Language barrier</td> <td data-bbox="873 1058 1401 1213">There was a lot of language barrier, yes language was a little issue with us this time, with 2 of our families actually and not even the same languages. [staff]</td> </tr> <tr> <td data-bbox="461 1247 646 1281">Age variation</td> <td data-bbox="873 1247 1417 1432">It was a really diverse group with 2-3 kids under 5. It was very challenging because of the age group, because parents had to bring the siblings and they were all in the activities. [staff]</td> </tr> </table>	Language barrier	There was a lot of language barrier, yes language was a little issue with us this time, with 2 of our families actually and not even the same languages. [staff]	Age variation	It was a really diverse group with 2-3 kids under 5. It was very challenging because of the age group, because parents had to bring the siblings and they were all in the activities. [staff]
Language barrier	There was a lot of language barrier, yes language was a little issue with us this time, with 2 of our families actually and not even the same languages. [staff]				
Age variation	It was a really diverse group with 2-3 kids under 5. It was very challenging because of the age group, because parents had to bring the siblings and they were all in the activities. [staff]				

---

#### 4.4.3 *Resources*

Although resources could be categorized as a facilitator or barrier (in some cases) they were assigned their own theme because of the nature and specificity of the feedback and the need to evaluate the resources very clearly.

Under the category of resources, two themes were identified: a) Training and b) Materials. Some of the codes related to training were: a) training being helpful, b) changes to training, and c) delays. Table 11 displays the quotes related to resources. Related to materials, codes such as: a) useful information, b) relevant information, and c) good resources were identified.

Table 11

*Themes and Subthemes Related to Resources that Emerged from Stakeholders' Interviews*

Themes	Sub-themes	Sample quotes
Training	Training was helpful	The training was great because they did a good job of going over everything that the manuals laid out in terms of activities and sort of the rituals that were built into every session. [staff]
	Delays	It was a bit of challenge cause so delayed so we forgot all of it, otherwise it was good. [staff]
		It was a bit challenging with that wait period between our training and then few months until we actually began the program so, there was a little bit of steep uphill kind of relearn between what we were taught period and then we got comfortable. [staff]
	Desired changes in training	Training had a lot of info about the workshop part not the activity part, It would be nice to see what a complete session looks like such as video tape. To understand how it should flow from a part to other. [staff]
Material	Positive feedback	With the parents the manual was very helpful because it provided me with all the information that I was then passing on to the parents. [staff] I think as its written out it's a great jumping off point. [staff]
	Negative comments	In the manual is that the parents complete a family

challenge each week and then they track these challenges on a chart and the parents earn stickers each week that they complete it! That came off as very juvenile and inappropriate for parents. [staff]

---

### *Facilitators Training Feedback*

Results from the facilitators training feedback illustrated that staff were satisfied with the quality of the training and information provided to them. All of the respondents (100%) reported the trainer's delivery of information and management of attendees to maximize learning opportunities was very effective (4 on a scale of 1 to 4). Similarly all staff (n = 5) reported that training was very effective in explaining the following program components: Parent Workshop , Active Play, and Healthy Families. All of the staff reported being confident (1/5) or highly confident (4/5) in their ability to run a session on their own after attending the training. All of the staff reported that the visual presentation of the information was either effective (1/5) or very effective (4/5).

#### 4.4.4 *Relevance and Appropriateness*

Families reported that the information provided in sessions were highly suitable and appropriate for their family as well as community (Figure 4).

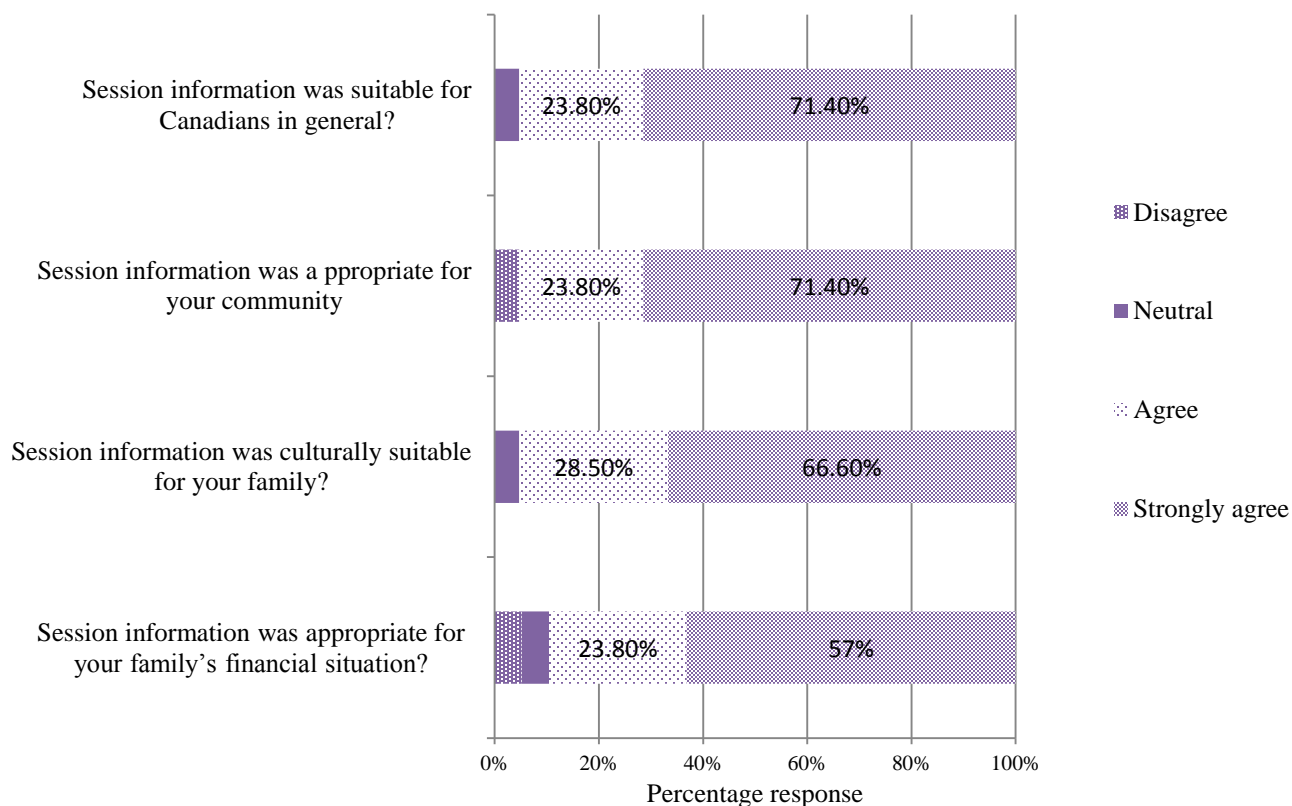


Figure 4. Relevance and appropriateness of information covered in sessions

#### 4.4.5 *Satisfaction*

##### *Child satisfaction*

Table 8 displays the results from child satisfaction survey. According to the parents, children had fun during the program and reported a high degree of satisfaction with program staff.

Table 12

*Results of the parent reported Child Satisfaction Survey*

	N	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
My child had fun on MEND 5-7?	21	61.90%	33.30%	0	0	4.70%
My child liked the MEND Health Families leaders?	21	61.90%	33.30%	0	0	4.70%
My child liked the MEND Active Play leaders?	21	33.30%	61.90%	0	0	4.70%
My child liked the MEND Power Time leaders?	21	57.10%	38%	0	0	4.70%

*Parent Satisfaction*

Results of the parent satisfaction survey showed a high degree of satisfaction with the program. 81% reported being less stressed about feeding their children and 76% of the parents reported being more confident about their ability to raise a healthy child.

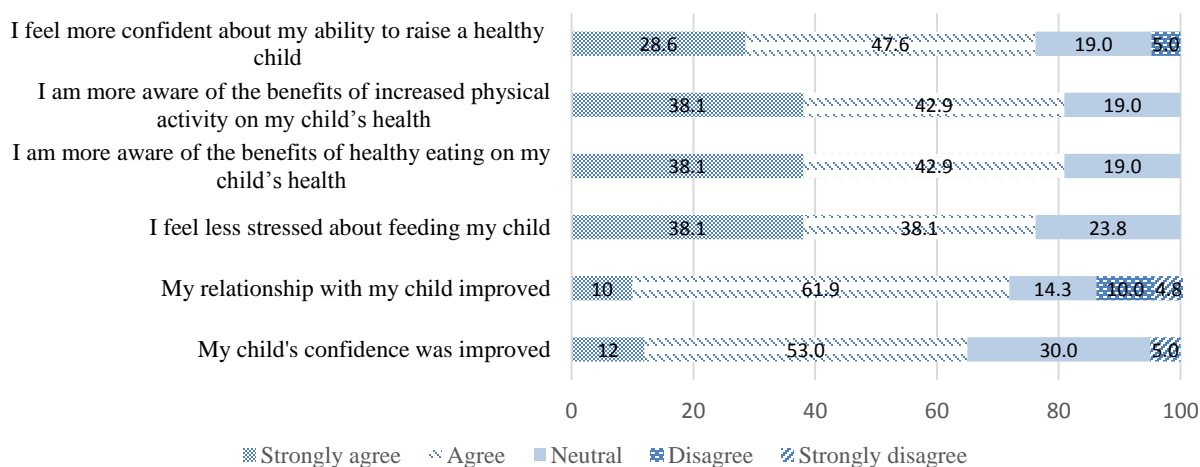


Fig 5. Results of parent satisfaction survey

**4.4.6 Fidelity**

The overall fidelity of the program was high. Session feedback forms completed by activity leaders showed that they followed the theme of the sessions as well as the activities laid

out in the manual most of the time. The fidelity scores for all of the sessions were above 65 percent. However the qualitative data showed that sometimes they had to adapt the activities based on the number of the participants, since most of the activities were designed for a group of ten or more children. Engagement was reported to be 100% for the active play sessions. Additionally, according to workshop leaders feedback forms, there was 90.5% fidelity to the manual content (Table 13).

Table 13

*Fidelity to Manual Content Reported by MEND Activity Leaders*

Activity	Yes	NO
Following warm up activity	80%	20%
Following Cool down activity	67%	33%
Following the themed activity	93%	7%

Site visits reports by regional coordinator contained elements of fidelity. Table 14 illustrates the fidelity to the program structure in three MEND delivery centers. Overall contents of the sessions were reported to be delivered according to the manual for the majority. A few comments were made to improve fidelity of the sessions such as the following quote:

The leaders encouraged all children and parents to participate in the moving story. One parent wasn't interested in participating. Perhaps discussing with the parent that participation is encouraged to help role model for their child. [Regional Coordinator]

Table 14

*Fidelity to Program Structure Reported by MEND Workshop Leaders*

Program Structure	Fidelity
All components of MEND 5-7 sessions are delivered	100%
Sessions are running for the prescribed length of time	100%
The session is delivered as scheduled	100%

**4.4.7 Quality**

To evaluate the quality of the sessions the following areas were addressed: facilitator's communication, facilitation skills, and management skills. Based on the qualitative report by regional coordinator, the overall quality was found to be good. The leaders encouraged the group to answer each others' questions, and kept the discussions on track and relevant.

**4.4.8 Safety**

During the site visits there were a number of safety issues to be including safety of the space and the absence of potential hazards. As shown in Table 15 safety recommendations were followed and there was only one safety issue identified in the visit report which related to the limited size of the space for active play.

Table 15

*Safety Issues that were Followed in MEND Delivery Sites, Reported by Regional Coordinator via Site Visit Reports*

Safety Issue	% of Sites that followed these
Program session areas are safe with no potential hazards or risks	100%
Program session spaces are large enough for group	100%
Leaders conduct sessions to ensure safe participant behaviour	100%

## 5 Discussion

### 5.1 Overview

The primary aim of this study was to evaluate implementation of MEND 5-7 in the BC context and specifically explore its feasibility, efficacy and reach. This was a mixed method case study design with equal weighting given to quantitative and qualitative data. The focus was on the perspective of the participants and quantitative data were used to add information on physiological and social variables that was not possible with qualitative methods alone (Morse & Niehaus, 2009). The quantitative aspect of the mixed-methods approach included a pre-post comparison of self-report and objective measures.

RE-AIM was the theoretical framework for this evaluation study. This framework helped to provide an understanding of the contextual factors that may affect program implementation and delivery. The RE-AIM framework has been used to evaluate other family based community childhood obesity interventions (Grow et al., 2014)

This chapter will discuss the findings within the categories of the RE-AIM framework and also compare the results to the existing literature. The limitations and delimitations of the study will also be discussed as well as recommendations for future research and intervention.

### 5.2 Reach

As the RE-AIM framework recommends, information about the reach of MEND 5-7 was collected in this study to enhance its external validity. Reach was represented as participation levels, accessibility, and representativeness of the sample. Results showed a low dropout rate (18%) and high level of participation with 95% of the children attending more than 70% of the sessions. Participation rates in this study were higher than those found in previous studies such as

Golley et al. (2007) where only 50% of the families attended more than three quarters of the program sessions. Participation was, however, consistent with the previous study of MEND 5-7 reported by Smith et al. (2013) where the mean attendance was calculated to be 73% and retention rate was 70%. The high retention rate is strength of this study, as the attrition rate in obesity treatment programs is usually a problem (Zeller et al., 2004).

Similar to this study Grow and colleagues used the RE-AIM framework to evaluate their program (Grow et al., 2014). They reported the reach by measuring program accessibility represented as language of delivery and session frequency, whereas in the present study accessibility of the program was measured via specific questions regarding accessibility and suitability of the location, and 85 percent of the families indicated that program was accessible.

In a process evaluation study by Welsby et al. (2014), reach was presented as the absolute number of the participants and representativeness of the sample. Furthermore, Pinard et al. (2012) measured representativeness by comparing participants enrolled in the program with the ones who declined. In order to have a deeper insight on the population reached by MEND 5-7, the present study measured the representativeness of the sample based on the estimated eligible population in three cities (30% of the population of children) where MEND was delivered. However, as this was a pilot in three communities and experienced some recruitment issues, the program was not reaching a high proportion of the target population, further evidenced by the fact that only 50% of the participants were overweight or obese. Recruitment through leisure centers and referrals by MEND participants were two strategies identified to be the most successful recruitment methods. Future research could include exploring more effective recruitment efforts to extend the reach to more overweight and obese children.

### 5.3 Efficacy

Analysis of the qualitative and quantitative data showed an overall positive effect of the intervention on families' health behaviours. Overall the effect of the program on physical activity and sedentary behaviour was positive with significant increases in time spent in playing active games and decreases in screen time. Although children's BMI and waist circumference did not change significantly, the program evaluation showed several positive behavioural improvements. Given the fact that 50% of children were a healthy weight it was unsurprising that significant changes in BMI were not observed. It should be noted that a previous feasibility study of MEND 7-13 showed significant improvements in children's BMI, waist circumference and self-esteem after the 3-month of the intervention (Sacher et al., 2005). Researchers have argued that taking measures of weight as the only indicator of success for a weight management intervention is a methodological limitation that underestimates behavioural changes (Strauss, 2000). Thus the present study used mixed methods to obtain a clear picture of the efficacy of the MEND program. In addition, the short length of the MEND 5-7 intervention (10 weeks, 1 hour 45 min session/weeks) and lack of follow up measurement makes it difficult to draw conclusions about the longer-term outcomes of the program. Conversely it may be that the lack of change found in this study was due to using a community-based evaluation team rather than health professionals or clinically or research trained staff to conduct the measurements. Finally the MEND intervention for the 5-7 age group emphasized healthy behaviours rather than weight reduction, whereas similar studies that demonstrated changes such as Foster et al. (2012) had a regular weigh-in component at home to keep track of weight changes.

As stated previously the duration of the sessions in the present study was limited to two hours for 10 weeks and staff interviews highlighted lack of time in sessions as a challenge. In

contrast, many other weight management programs had longer treatment lengths (Epstein et al., 1984; Janicke et al., 2008; Rodearmel et al., 2009). Some of the previous successful studies also included few telephone sessions to extend the reach of the intervention (Pinard et al., 2012; West, Sanders, Cleghorn, & Davies, 2010).

A positive aspect of this program was a number of improvements in health outcomes beyond body weight. As seen in Table 2 there was an overall positive effect on fruit and vegetable consumption of the parents and children. Throughout the MEND 5-7 program, children had the opportunity to try a variety of vegetables and fruits through the exposure technique of looking, smelling, touching, kissing, and tasting these foods. Parents were taught techniques and methods to change or maintain healthy eating and mealtime behaviours such as achieving Canada's Food Guide recommendation of the five servings of vegetables and fruit a day for this age group (Health Canada, 2007). Though the number of children's fruit and vegetables appeared to increase slightly, this improvement was not significant. These findings were consistent with the findings of the study by Pinard et al. (2012), where only parents showed an increase in vegetable consumption as a result of intervention. In addition, the quantitative evaluation did identify a number of parent-reported changes in the physical/sedentary activity and nutrition habits of the children.

Parents reported that participation in MEND helped them to understand the physical activity guidelines, serving sizes and also help them make more wise decisions regarding the number and type of the foods they fed their children. Qualitative themes that emerged from parent feedback forms indicated that in addition to improvement in eating and physical activity behaviours, participation in MEND helped parents to spend more play time with their children. These indicators certainly point to the promise of the program's effectiveness over the long-term.

## **5.4 Implementation**

As this was the first pilot of the MEND 5-7 program in BC an important focus of the evaluation was implementation. According to RE-AIM framework implementation studies are conducted to understand to what extent the intervention was delivered as intended. A systematic review of family-based obesity programs reported that process evaluations were mainly limited to information about participant satisfaction and attendance (Knowlden & Sharma, 2012), whereas this study addressed multiple layers of implementation. Implementation was represented by collecting information about the facilitators and barriers to program delivery, the overall fidelity and quality of the program delivery and quality of the resources provided by MEND.

### **5.4.1 Facilitators**

Staff expressed that creativity and flexibility was very helpful in running the program smoothly. Staff reported adapting some of the activities based on the weather conditions or going beyond the manual content in order to help families to understand the health behaviours or facilitate the behaviour change. Results of the internal stakeholders' interviews showed that planning and preparation played an important part in program implementation. Though flexibility and creativity were great factors in facilitating the delivery, fidelity to program content was reported to be high. Staff reported that diversity among the group participants resulted in adaptation of the content, which ultimately helped with delivery of the sessions.

Engagement from the participants was identified as a strong facilitator of program implementation. Staff expressed that excitement from the children and their motivation created a great learning environment. Staff also reported that parents' engagement in discussions and support for each other was significant. Similarly the results of the study by Edwards et al. (2006) indicated that support from other families was valuable for the participants. Furthermore, the

process evaluation of the WATCH IT program showed that finding friendship and feelings of acceptance were facilitators to family participation (Rudolf et al., 2006).

Community relations were also a facilitator identified by staff. A recent study examined process evaluation results from obesity prevention interventions in 14 countries (Pettigrew, 2014). Results of this online survey showed that maintaining effective working relationships with multiple collaborators in the community such as schools, research institutions, and media was a great help to program implementation. Similar to these findings, internal stakeholders expressed that their strong community relations with a research institution and schools helped them with program delivery.

Additionally staff expressed that teamwork and great team dynamics and sharing ideas with one another was a key to their success. They also valued the support they received from other team members and regional coordinators. A few staff suggested future support and collaboration among various delivery sites could facilitate program delivery.

#### **5.4.2 Barriers**

Multiple barriers were identified by both parents, and staff; among which time was a significant one. Parents expressed that duration of the sessions and the time commitment was a barrier for their participation and this finding was consistent with previous studies. Results from a study by Kitscha, Brunet, Farmer, and Mager (2009) exploring the reasons for non-returning to a pediatric weight management program, indicated that physical barriers including scheduling, parking and location were among the major barriers. Similarly the process evaluation of a childhood obesity program implemented by Golley et al. (2007) found that major barriers were session timing and frequency. On the other hand, staff in this study recounted a different experience with program time, noting often that length of the program and duration of individual

sessions was a limiting factor to covering all of the information and to answering all the questions.

According to the staff, recruitment was a big challenge in all three sites. Staff identified that despite using various advertising strategies, leisure centres and referrals from participants proved to be the most successful in enrolling families. Similarly, previous obesity programs have also used self-referral effectively as a method to recruit families (Rudolf et al., 2006).

Parental involvement was classified as a barrier as well as a facilitator. As a barrier, staff reported that it was difficult to get the parents involved as much as the kids. Some of the parents did not show a lot of interest; however their involvement improved going forward. In addition punctuality was identified as a barrier by the staff, as families had other priorities and late-comers usually made it difficult to start on time. Staff also reported that age variation within the group and participation of older or younger siblings was a barrier to session delivery. In addition, conflicting opinions among parents and language barriers were also a challenge to program delivery.

### **5.4.3 Resources**

To evaluate the quality of the resources, satisfaction with training and intervention materials was assessed. Staff reported that the parent manual was helpful and contained a lot of useful information. However, lack of flexibility in the manual was also highlighted a few times. Staff expressed that sometimes the discussions with parents would go beyond the outline of the manual, or the kids did not like the activity that was outlined in the manual, leading staff to adapt the activities/information in order to meet the needs of the participants.

Based on the interview results, staff expressed a high degree of satisfaction with the training and delivery material. However they found the delay in delivery of the program, which was caused by recruitment difficulties, to be challenging. In addition one of the staff suggested that incorporating a sample delivery session in training would be helpful.

#### **5.4.4 Fidelity**

Measuring fidelity is important to documenting the extent of the deviation from the original model or protocols (Bond, Becker, Drake, & Vogler, 1997). The fidelity measures considered in this study were: a) adherence to the program content, and b) quality of delivery. Adherence could be defined as the extent to which the program delivery staff followed the protocol (Bishop et al., 2014). According to Mowbray and colleagues measuring adherence helps the findings to be more standardized and replicable (Mowbray, Holter, Teague, & Bybee, 2003). Knowlden and Sharma (2012) argued that failure to report fidelity makes it difficult to measure the actual outcomes of a program. West, Sanders, Cleghorn, and Davies (2010) measured fidelity to protocol using session checklists. Similarly, Pinard et al. (2012) measured the fidelity of the program as program agents' fidelity to protocols. The present study used session feedback forms as a self-report measure of program fidelity, in combination with site visit reports by the regional coordinator, to confirm the quality of the implementation. The overall fidelity to the program was found to be high. Program staff reported adherence to the themes of the program and manual content in most of the sessions. Sometimes staff reported deviating from the workshop content due to participants' questions and in order to facilitate the implementation.

#### **5.4.5 Relevance and appropriateness**

We also measured relevance and appropriateness of the information and a majority of the families reported that program content was appropriate for their community and Canadian culture. No other process evaluation studies identified in this review of literature reported the measures of appropriateness. However, an efficacy study by Chen, Weiss, Heyman, and Lustig, (2009) reported that high attrition rate in their intervention group was due to the culturally appropriate content. In addition a recent review of family based models for childhood obesity reported that a missing component of the reviewed studies was culture and this should receive a greater attention (Sung-Chen, Sung, Zhao, & Brownson, 2013).

#### **5.4.6 Quality**

Quality of the delivery session was measured by site visit reports completed by a regional coordinator. Variables such as communication, facilitation skills, and management skills were addressed. The overall quality of sessions was rated as good while a few recommendations were made about enhancing the discussions among parents and encouraging the participants to take part in discussions. Previous literature, such as the study by Golley, Perry, Magarey and Daniels (2007), evaluated the quality of the program by feedback from participants whereas the present study provides further insight into the quality of program delivery.

#### **5.4.7 Safety**

As part of the implementation evaluation we also measured the safety of the program by considering safety of the program content (no health risks for participants) and safety of the location. The overall safety of the program was rated as good and leaders reported being successful in ensuring the safety of the participants. The present study was the first in literature

to measure the safety of the program, therefore it might be considered as a strength of this process evaluation.

## **5.5 Conclusion**

The present study provided evidence for the impact of family based weight management programs for children aged 5-7 years and addressed gaps in the process evaluations of family-based community programs such as the measurement of quality, safety and fidelity. The evaluation of the MEND 5-7 pilot in BC was based on the RE-AIM framework and focused on reach, effectiveness and implementation and was developed with knowledge translation as a key goal. Although the reach of the three pilot sites was not extensive due to budgetary and recruitment constraints, the overall impact of the program on improving families' lifestyle and health behaviour was found to be positive through multiple measures. There were also early indications that initial outcomes were consistent with those intended for the program such as: lifestyle improvements and increased levels of physical activity for families. Implementation evaluation showed that the program was feasible and appropriate for BC families. A number of barriers were identified that could be overcome in future programs, including: time, location, diversity, parental involvement, and lack of flexibility in the manual. Recruitment was a challenge that could be addressed through improving advertising and marketing strategies, and better utilizing community relationships to engage participants in the program. The results of this process evaluation can inform the implementation of future weight management programs for 5-7 old children of BC.

## **5.6 Limitations and Delimitation**

The results were encouraging but some limitations of the study should be acknowledged. One limitation was the reliance on self-report and parent-reported data, which could be a source

of bias. A few other studies have used objective measurement of physical activity using pedometers or accelerometers (Stark et al., 2011). Due to the issues with recruitment, fifty percent of the participants were a normal weight therefore it was not appropriate to decide whether the intervention had a positive impact on BMI. Recruitment issues affected the session length with 33% of the participating sites running for less than the recommended 10 sessions. Since the program was designed as a 10 week program to give families adequate contact time and allow them to learn and practice behaviour change techniques, this could have compromised program outcomes and effectiveness. Small sample size was also a limiting factor to program delivery and evaluation. Program content and the majority of the activities were designed for a larger group of people and most of the sessions had to run with less than the recommended number of participants which could affect the quality and efficacy of program.

Although a pre post- measurement of variables was used to assess the changes triggered by the intervention, lack of a comparison group made it difficult to decide the extent to which the program was responsible for the changes made by participants. Another limitation of this study was lack of follow up of MEND participants. The RE-AIM framework addresses the importance of maintenance, and authors such as Muckelbauer et al. (2009) suggested that process evaluation and long-term surveillance are necessary to understand the feasibility and sustainability of the interventions. Finally, researcher bias in analysing the qualitative data should be acknowledged.

## **5.7 Future Recommendations**

The success of community based obesity programs may be realized when they have reached a substantial population of the target audience and are effectively designed and delivered. As a result of this process evaluation, strengths and limitations of the MEND 5-7 program were identified. Programmatically, the results suggest that there are opportunities to

extend the reach of the program by introducing recruitment strategies to attract more participants. As well, to achieve more substantial behaviour and BMI changes future studies should increase the 'dose' (e.g., length of the treatment and duration of the sessions) to facilitate behaviour change and increase the exposure to the treatment. The balance between fidelity and flexibility/program adaptability was highlighted in the results; a finding certainly not exclusive to this study. The tension between adherence to a standardized protocol versus contextual adaptation has been highlighted in the implementation literature for decades (e.g., Armstrong, Waters, Crockett, & Kelehr, 2007; Dzewaltowski, Estabrooks, Klesges, Bull, & Glasgow, 2004; Green, 2007; Nutley, Walter, & Davies, 2007), and remains a critical element of study in implementation science. The importance of adaptability is also suggested by the work of Kumar and colleagues (Kumar et al., 2014) that emphasized the importance of community-based participation in program design and implementation. Thus, a key consideration moving forward should be accommodating community level adaptations while maintaining fidelity to key content, as well as engaging MEND participants in shaping contextual aspects of the program. Finally, follow-up measurements should be conducted to examine the long term outcomes of the study and future research should incorporate a comparison group to provide a better understanding of the treatment effect.

## Bibliography

- Abildso, C. G., Zizzi, S. J., & Reger-Nash, B. (2010). Evaluating an insurance-sponsored weight management program with the RE-AIM model, West Virginia, 2004-2008. *Preventing Chronic Disease*, 7(3), A46
- Adair, L. S., & Popkin, B. M. (2005). Are child eating patterns being transformed globally?. *Obesity Research*, 13(7), 1281-1299.
- Akers, J. D., Estabrooks, P. A., & Davy, B. M. (2010). Translational research: Bridging the gap between long-term weight loss maintenance research and practice. *Journal of the American Dietetic Association*, 110(10), 1511-1522.e3. doi:10.1016/j.jada.2010.07.005
- Andersen, R. E. (2000). The spread of the childhood obesity epidemic. *CMAJ : Canadian Medical Association Journal = Journal De l'Association Medicale Canadienne*, 163(11), 1461-1462.
- Anderson, S., He, X., Schoppe-Sullivan, S., & Must, A. (2010). Externalizing behavior in early childhood and body mass index from age 2 to 12 years: Longitudinal analyses of a prospective cohort study. *Bmc Pediatrics*, 10(1), 49-49. doi:10.1186/1471-2431-10-49
- Anonymous, & American Psychological Association. (2002). Criteria for evaluating treatment guidelines. *The American Psychologist*, 57(12), 1052-1059. doi:10.1037/0003-066X.57.12.1052
- Antikainen, I., & Ellis, R. (2011). A RE-AIM evaluation of theory-based physical activity interventions. *Journal of Sport & Exercise Psychology*, 33(2), 198.
- Arauz Boudreau, A. D., Kurowski, D. S., Gonzalez, W. I., Dimond, M. A., & Oreskovic, N. M. (2013). Latino families, primary care, and childhood obesity: A randomized controlled trial. *American Journal of Preventive Medicine*, 44(3 Suppl 3), S247-S257. doi:10.1016/j.amepre.2012.11.026
- Armstrong, R., Waters, E., Crockett, B., & Kelehr, H. (2007). The nature of evidence resources and knowledge translation of health promotion practitioners. *Health Promotion International* 22(3), 254-260.
- Atlantis, E., Barnes, E. H., & Singh, M. A. F. (2006). Efficacy of exercise for treating overweight in children and adolescents: A systematic review. *International Journal of Obesity*, 30(7), 1027-1040. doi:10.1038/sj.ijo.0803286
- Avery, A., Pallister, C., Allan, J., Stubbs, J., & Lavin, J. (2012). An initial evaluation of a family-based approach to weight management in adolescents attending a community weight management group. *Journal of Human Nutrition and Dietetics*, 25(5), 469-476. doi:10.1111/j.1365-277X.2012.01277.x
- Barlow, S. E., Expert Committee, & and the Expert Committee. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and

adolescent overweight and obesity: Summary report. *Pediatrics*, 120, Suppl 4(Supplement), S164-S192. doi:10.1542/peds.2007-2329C

- Barton, S., Walker, L., Lambert, G., Gately, P., & Hill, A. (2004). Cognitive change in obese adolescents losing weight. *Obesity*, 12(2), 313-319. doi:10.1038/oby.2004.39
- Bishop, D. C., Pankratz, M. M., Hansen, W. B., Albritton, J., Albritton, L., & Strack, J. (2014). Measuring Fidelity and Adaptation Reliability of a Instrument for School-Based Prevention Programs. *Evaluation & the health professions*, 37(2), 231-257.
- Boles, R., Scharf, C., & Stark, L. (2010). Developing a treatment program for obesity in preschool-age children: Preliminary data. *Children's Health Care*, 39(1), 34-58. doi:10.1080/02739610903455137
- Bond, G. R., Becker, D. R., Drake, R. E., et al. (1997). A fidelity scale for the individual placement and support model of supported employment. *Rehabilitation Counseling Bulletin*, 40, 265-284.
- Bray GA, Bouchard C, James WPT (1998). *Handbook of obesity*. New York: Marcel Dekker
- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public health reports*, 100(2), 126.
- Centers for Disease Control and Prevention. Trends in the Prevalence of Extreme Obesity Among US Preschool-Aged Children Living in Low-Income Families, 1998-2010. *The Journal of American Medical Association*. 2012; 308 (24): 2563-2565
- Chahine, N., Potter, A., & Freeman, M. (2010). The MEND program: A community based initiative addressing child overweight and obesity in maribyrnong. *Journal of Science and Medicine in Sport*, 12, e140-e141. doi:10.1016/j.jsams.2009.10.293
- Chen, J. L., Kwan, M., Mac, A., Chin, N. C., & Liu, K. (2013). iStart Smart: A Primary-Care Based and Community Partnered Childhood Obesity Management Program for Chinese-American Children: Feasibility Study. *Journal of Immigrant and Minority Health*, 15(6), 1125-1128.
- Christison, A., & Khan, H. A. (2012). Exergaming for Health A Community-Based Pediatric Weight Management Program Using Active Video Gaming. *Clinical pediatrics*, 51(4), 382-388.
- Clark, H. R., Goyder, E., Bissell, P., Blank, L., & Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *Journal of Public Health*, 29(2), 132-141.df
- Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing A standard definition for child overweight and obesity worldwide: International survey. *British Medical Journal*, 320(7244), 1240-1243. doi: 10.1136/bmj.320.7244.1240

- Cole, Timothy J., Jennifer V. Freeman, and Michael A. Preece. "Body mass index reference curves for the UK, 1990." *Archives of disease in childhood* 73.1 (1995): 25-29.
- Cook-Cottone, C., Casey, C. M., Feeley, T. H., & Baran, J. (2009). A meta-analytic review of obesity prevention in the schools: 1997–2008. *Psychology in the Schools*, 46(8), 695-719.
- Daniels, S., Arnett, D., Eckel, R., Gidding, S., Hayman, L., Kumanyika, S., et al. (2005). Overweight in children and adolescents. Pathophysiology, consequences, prevention and treatment. *Circulation*, 111, 1999–2012.
- Danielsen, Y. S., Nordhus, I. H., Júlíusson, P. B., Mæhle, M., & Pallesen, S. (2013). Effect of a family-based cognitive behavioural intervention on body mass index, self-esteem and symptoms of depression in children with obesity (aged 7-13): A randomised waiting list controlled trial. *Obesity Research & Clinical Practice*, 7(2), e116-E128. doi:10.1016/j.orcp.2012.06.003
- Davis, P. H., Dawson, J. D., Riley, W. A., & Lauer, R. M. (2001). Carotid intimal-medial thickness is related to cardiovascular risk factors measured from childhood through middle age: The Muscatine Study. *Circulation*, 104, 2815–2819.
- Dietz WH. (1994). Critical periods in childhood for the development of obesity. *American Journal Of Clinical Nutrition*, 59(5), 955-959
- Dietz, WH. (1998). Health consequences of obesity in youth: Childhood predictors of adult disease. *Paediatrics*, 101(3S):518–25.
- Dietz, W. H., & Robinson, T. N. (2005). Clinical practice. Overweight children and adolescents. *New England Journal of Medicine*, 352, 2100–2109.
- Duarte, C. S., Almqvist, F., Must, A., Sourander, A., Nikolakaros, G., Pihlajamaki, H., . . . Tamminen, T. (2010). Child mental health problems and obesity in early adulthood. *The Journal of Pediatrics*, 156(1), 93-97. doi:10.1016/j.jpeds.2009.06.066
- Ebbeling CB, Pawlak DB, Ludwig DS. Childhood obesity: publichealth crisis, common sense cure. *Lancet* 2002;360(9331):473–82.
- Dzewaltowski, D., Estabrooks, P., Klesges, L., Bull, S., & Glasgow, R. (2004). Behavior change intervention research in community settings: how generalizable are the results? *Health Promotion International*, 19(2), 235-245.
- Edwards, J., Evans, J., & Brown, A. D. (2008). Using routine growth data to determine overweight and obesity prevalence estimates in preschool children in the Capital Health Region of Alberta. *Canadian Journal of Public Health*, 99(2).
- Edwards, C., Nicholls, D., Croker, H., Van Zyl, S., Viner, R., & Wardle, J. (2006). Family-based behavioural treatment of obesity: Acceptability and effectiveness in the UK. *European Journal of Clinical Nutrition*, 60(5), 587-592. doi:10.1038/sj.ejcn.1602353

- Epstein, L. H., Gordy, C. C., Raynor, H. A., Beddome, M., Kilanowski, C. K., & Paluch, R. (2001). Increasing fruit and vegetable intake and decreasing fat and sugar intake in families at risk for childhood obesity. *Obesity research*, *9*(3), 171-178.
- Epstein, L.H., Paluch, R.A, Roemmich, J.N, & Beecher, M.D (2007). Family-based obesity treatment, then and now: Twenty five years of pediatric obesity treatment. *Health Psychology*, *26*, 381-391
- Epstein, L. H., Roemmich, J. N., & Raynor, H. A. (2001). Behavioral therapy in the treatment of pediatric obesity. *Pediatric Clinics of North America*, *48*(4), 981-993.
- Epstein, L. H., Valoski, A. M., Vara, L. S., McCurley, J., Wisniewski, L., Kalarchian, M. A., ... & Shrager, L. R. (1995). Effects of decreasing sedentary behavior and increasing activity on weight change in obese children. *Health psychology*, *14*(2), 109.
- Epstein, L. H., & Wing, R. R. (1987). Behavioral treatment of childhood obesity. *Psychological Bulletin*, *101*(3), 331-342. doi:10.1037/0033-2909.101.3.331
- Erickson, S. J., Robinson, T. N., Haydel, K. F., & Killen, J. D. (2000). Are overweight children unhappy?: Body mass index, depressive symptoms, and overweight concerns in elementary school children. *Archives of Pediatrics & Adolescent Medicine*, *154*(9), 931-935.
- Fitch, A., & Bock, J. (2009). Effective dietary therapies for pediatric obesity treatment. *Reviews in Endocrine & Metabolic Disorders*, *10*(3), 231-236. doi:10.1007/s11154-009-9113-9
- Foster, G. D., Sundal, D., McDermott, C., Jelalian, E., Lent, M. R., & Vojta, D. (2012). Feasibility and preliminary outcomes of a scalable, community-based treatment of childhood obesity. *Pediatrics*, *130*(4), 652-659.
- Freedman DS, Dietz WH, Srinivasan SR, Berenson GS. Freedman, D. S., Dietz, W. H., Srinivasan, S. R., & Berenson, G. S. (1999). The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Heart Study. *Pediatrics*, *103*(6), 1175-1182.
- Garipagaoglu, M. (2009). Family-based group treatment versus individual treatment in the management of childhood obesity: Randomized, prospective clinical trial. *European Journal of Pediatrics*, *168*(9), 1091-1099.
- Gately PJ. (2000). The acute effects of an 8-week diet, exercise, and educational camp program on obese children. *Pediatric Exercise Science*, *12*(4), 413.
- Gerards, Sanne M P L, Sleddens, E. F. C., Dagnelie, P. C., de Vries, N. K., & Kremers, S. P. J. (2011). Interventions addressing general parenting to prevent or treat childhood obesity. *International Journal of Pediatric Obesity: IJPO: An Official Journal of the International Association for the Study of Obesity*, *6*(2-2), e28-E45. doi:10.3109/17477166.2011.575147

- Glasgow, R. E., Lichtenstein, E., & Marcus, A. C. (2003). Why don't we see more translation of health promotion research to practice? rethinking the efficacy-to-effectiveness transition. *American Journal of Public Health, 93*(8), 1261-1267. doi:10.2105/AJPH.93.8.1261
- Golan, M. (2006). Parents as agents of change in childhood obesity—from research to practice. *International Journal of Pediatric Obesity, 1*(2), 66–76.
- Golan, M., & Crow, S. (2004). Parents are key players in the prevention and treatment of weight-related problems. *Nutrition Reviews, 62*, 39–50.
- Golley, R. K., Hendrie, G. A., Slater, A., & Corsini, N. (2011). Interventions that involve parents to improve children's weight-related nutrition intake and activity patterns—what nutrition and activity targets and behaviour change techniques are associated with intervention effectiveness?. *Obesity reviews, 12*(2), 114-130.
- Golley, R. K., Perry, R. A., Magarey, A., & Daniels, L. (2007). Family-focused weight management program for five- to nine-year-olds incorporating parenting skills training with healthy lifestyle information to support behavior modification. *Nutrition & Dietetics, 64*(3), 144-150. doi: 10.1111/j.1747-0080.2007.00106.
- Green, L.W. (2007). Translation 2 research, the roadmap less traveled. *American Journal of Preventive Medicine, 33*(2), 137-138.
- Grow, H. M. G., Hencz, P., Verbovski, M. J., Gregerson, L., Liu, L. L., Dossett, L., ... & Saelens, B. E. (2014). Partnering for Success and Sustainability in Community-Based Child Obesity Intervention: Seeking to Help Families ACT!. *Family & community health, 37*(1), 45-59
- Grimes-Robison, C., & Evans, R. R. (2008). Benefits and barriers to medically supervised pediatric weight-management programs. *Journal of Child Health Care, 12*(4), 329-343.
- Gruber, K. J., & Haldeman, L. A. (2009). Using the family to combat childhood and adult obesity. *Preventing Chronic Disease, 6*(3), A106.
- Guo, S. S., Wu, W., Cumlea, W. C., & Roche, A. F. (2002). Predicting overweight and obesity in adulthood from body mass index values in adolescence. *American Journal of Clinical Nutrition, 76*, 653–658.
- Haire-Joshu, D., Elliott, M. B., Caito, N. M., Hessler, K., Nanney, M. S., Hale, N., . . . Brownson, R. C. (2008). High 5 for kids: The impact of a home visiting program on fruit and vegetable intake of parents and their preschool children. *Preventive Medicine, 47*(1), 77-82. doi:10.1016/j.ypmed.2008.03.016
- Hanson, W. E., Creswell, J. W., Clark, V., Petska, K. S., & Creswell, J. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology, 52*(2), 224-235. doi:10.1037/0022-0167.52.2.224

- He, Q., Ding, Z. Y., Fong, D. Y., & Karlberg, J. (2000). Blood pressure is associated with body mass index in both normal and obese children. *Hypertension*, *36*, 165–170.
- Hillman JB, Dorn LD, Huang B. (2010). Association of anxiety and depressive symptoms and adiposity among adolescent females, using dual energy x-ray absorptiometry. *Clinical Pediatrics*, *49*(7):671–7.
- Hughes, A. R., Stewart, L., Chapple, J., McColl, J. H., Donaldson, M. D. C., Kelnar, C. J. H., . . . Reilly, J. J. (2008). Randomized, controlled trial of a best-practice individualized behavioral program for treatment of childhood overweight: Scottish childhood overweight treatment trial (SCOTT). *Pediatrics*, *121*(3), e539-E546. doi:10.1542/peds.2007-1786
- James, K. S., Connelly, C. D., Rutkowski, E., McPherson, D., Gracia, L., Mareno, N., & Zirkle, D. (2008). Family-based weight management with latino mothers and children. *Journal for Specialists in Pediatric Nursing: JSPN*, *13*(4), 249-262. doi: 10.1111/j.1744 6155.2008.00162.x
- Janicke, D., Gray, W., Mathews, A., Simon, S., Lim, C., Dumont-Driscoll, M., & Silverstein, J. (2011). A pilot study examining a group-based behavioral family intervention for obese children enrolled in medicaid: Differential outcomes by race. *Children's Health Care*, *40*(3), 212-231. doi:10.1080/02739615.2011.590394
- Jansen, W., Borsboom, G., Meima, A., Zwanenburg, E. J., Mackenbach, J. P., Raat, H., & Brug, J. (2011). Effectiveness of a primary school-based intervention to reduce overweight. *International Journal of Pediatric Obesity: IJPO: An Official Journal of the International Association for the Study of Obesity*, *6*(2-2), e70-E77. doi:10.3109/17477166.2011.575151
- Johnson, S. S., Paiva, A. L., Cummins, C. O., Johnson, J. L., Dymont, S. J., Wright, J. A., ... & Sherman, K. (2008). Transtheoretical model-based multiple behavior intervention for weight management: effectiveness on a population basis. *Preventive Medicine*, *46*(3), 238-246.
- Kalarchian, M. A., Levine, M. D., Arslanian, S. A., Ewing, L. J., Houck, P. R., Cheng, Y., . . . Marcus, M. D. (2009). Family-based treatment of severe pediatric obesity: Randomized, controlled trial. *Pediatrics*, *124*(4), 1060-1068. doi: 10.1542/peds.2008-3727
- Kitscha, C. E., Brunet, K., Farmer, A., & Mager, D. R. (2009). Reasons for non-return to a pediatric weight management program. *Canadian Journal of Dietetic Practice and Research*, *70*(2), 89-94.
- Kitzmann, K., Dalton, W., Stanley, C., Beech, B., Reeves, T., Buscemi, J., . . . Midgett, E. (2010). Lifestyle interventions for youth who are overweight: A meta-analytic review. *Health Psychology*, *29*(1), 91-101. doi:10.1037/0017437

- Klesges, L. M., Dzewaltowski, D. A., & Glasgow, R. E. (2008). Review of external validity reporting in childhood obesity prevention research. *American Journal of Preventive Medicine, 34*(3), 216-223.
- Koch, F., Sepa, A., & Ludvigsson, J. (2008). Psychological stress and obesity. *Journal of Pediatrics, 153*:839–44.
- Kramer, M. S., Chalmers, B., Hodnett, E. D., Sevkovskaya, Z., Dzikovich, I., Shapiro, S., ... & PROBIT Study Group. (2001). Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *Journal of American Medical Association 285*(4), 413-420.
- Kumar, J., Kidd, T., Li, Y., Lindshield, E., Muturi, N., & Adhikari, K. (2014). Using the Community-Based Participatory Research (CBPR) Approach in Childhood Obesity Prevention. *International Journal of Child Health and Nutrition, 3*(4), 170-178.
- Lau, D. C., Douketis, J. D., Morrison, K. M., Hramiak, I. M., Sharma, A. M., & Ur, E. (2007). 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children [summary]. *Canadian Medical Association Journal, 176*(8), S1-S13.
- Lazorick, S., Crawford, Y., & Hardison, G. T. (2013). School-based obesity treatment: The MATCH program. *North Carolina Medical Journal, 74*(1), 35-36.
- Lindsay, A. C., Sussner, K. M., Kim, J., & Gortmaker, S. (2006). The role of parents in preventing childhood obesity. *Future of Children, 16*(1), 169–186.
- Lobstein T, Baur L, Uauy R. (2004). Obesity in children and young people: a crisis in public health. *Obesity Review. 5*(Suppl 1):4–104.
- Luttikhuis, H., Baur, L., Jansen, H., Shrewsbury, V., O'Malley, C., Stolk, R., . . . Cochrane Heart Grp. (2009). Interventions for treating obesity in children. *Sao Paulo Medical Journal, 127*(5), 321-321. doi:10.1590/S1516-31802009000500015
- Magarey, A., M., Perry, R., A., Baur, L., A., Steinbeck, K., S., Sawyer, M., Hills, A., P., . . . Daniels, L., A. (2011). A parent-led family-focused treatment program for overweight children aged 5 to 9 years: The PEACH RCT. *Pediatrics, 127*(2), 214-222. doi:
- McGarvey, E., Keller, A., Forrester, M., Williams, E., Seward, D., & Suttle, D. E. (2004). Feasibility and benefits of a parent-focused preschool child obesity intervention. *American Journal of Public Health, 94*(9), 1490-1495.
- Mannino, D. M., Mott, J., Ferdinands, J. M., Camargo, C. A., Friedman, M., Greves, H. M., et al. (2006). Boys with high body masses have an increased risk of developing asthma: Findings from the National Longitudinal Survey of Youth (NLSY). *International Journal of Obesity, 30*, 6–13.

- Marcus, C. L., Curtis, S., Koerner, C. B., Joffe, A., Serwint, J. R., & Loughlin, G. M. (1996). Evaluation of pulmonary function and polysomnography in obese children and adolescents. *Pediatric Pulmonology*, *21*, 176–183.
- Morse, J. M., & Niehaus, L. (2009). *Mixed method design: Principles and procedures* (Vol. 4). Walnut Creek, CA, USA: Left Coast Press Inc.
- Mowbray, C. T., Holter, M. C., Teague, G. B., & Bybee, D. (2003). Fidelity criteria: Development, measurement, and validation. *American Journal of Evaluation*, *24*(3), 315-340.
- Must, A., & Strauss, R. S. (1999). Risks and consequences of childhood and adolescent obesity. *International Journal of Obesity and Related Metabolic Disorders: Journal of the International Association for the Study of Obesity*, *23 Suppl 2*, S2-S11.  
doi:10.1038/sj/ijo/0800852
- Nader, P. R., O'Brien, M., Houts, R., Bradley, R., Belsky, J., Crosnoe, R., et al. (2006). Identifying risk for obesity in early childhood. *Pediatrics*, *118*, 594–601
- Nie, N. H., Bent, D. H., & Hull, C. H. (1975). *SPSS: Statistical package for the social sciences* (Vol. 421, pp. 250-265). New York: McGraw-Hill.
- Nutley, S., Walter, I., & Davies, H.T.O. (2007). *Using evidence. How research can inform public services*. UK: The Policy Press.
- Obarzanek, E., Schreiber, G. B., Crawford, P. B., Goldman, S. R., Barrier, P. M., Frederick, M. M., & Lakatos, E. (1994). Energy intake and physical activity in relation to indexes of body fat: The national heart, lung, and blood institute growth and health study. *The American Journal of Clinical Nutrition*, *60*(1), 15-22.
- Ogden, C. L., Carroll, M. D., Curtin, L. R., Lamb, M. M., & Flegal, K. M. (2010). Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA: The Journal of the American Medical Association*, *303*(3), 242-249. doi:10.1001/jama.2009.2012
- Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA: The Journal of the American Medical Association*, *295*(13), 1549-1555.  
doi:10.1001/jama.295.13.1549
- Parsons, T.J., Power, C., Logan, S., Summerbell, C.D.(1999). Childhood predictors of adult obesity: a systematic review. *International Journal of Obesity*, *23*(Suppl 8):S1–S107.
- Patrick, H., & Nicklas, T. A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of the American College of Nutrition*, *24*(2), 83-92.

- Pettigrew, S., Borys, J. M., du Plessis, H. R., Walter, L., Huang, T. T., Levi, J., & Vinck, J. (2014). Process evaluation outcomes from a global child obesity prevention intervention. *BMC Public Health, 14*(1), 757.
- Pinard, C. A., Hart, M. H., Hodgkins, Y., Serrano, E. L., McFerren, M. M., & Estabrooks, P. A. (2012). Smart choices for healthy families: A pilot study for the treatment of childhood obesity in low-income families. *Health Education & Behavior, 39*(4), 433-445. doi: 10.1177/1090198111425686
- Pine, D. S., Goldstein, R. B., Wolk, S., & Weissman, M. M. (2001). The association between childhood depression and adulthood body mass index. *Pediatrics, 107*(5), 1049-1056.
- Pinhas-Hamiel, O., Dolan, L. M., Daniels, S. R., Standiford, D., Khoury, P. R., & Zeitler, P. (1996). Increased incidence of non-insulin-dependent diabetes mellitus among adolescents. *Journal of Pediatrics, 128*, 608-615
- Puhl R.M, Latner J.D (2007) Stigma, obesity, and the health of the nation's children. *Psychology Bulletin, 133*(4):557-80.
- Quattrin, T., Roemmich, J. N., Paluch, R., Yu, J., Epstein, L. H., & Ecker, M. A. (2012). Efficacy of family-based weight control program for preschool children in primary care. *Pediatrics, 130*(4), 660-666. doi:10.1542/peds.2012-0701
- Rao, G. (2008). Childhood obesity: Highlights of AMA expert committee recommendations. *American Family Physician, 78*(1), 56-63.
- Rieder, J., Khan, U., Heo, M., Mossavar-Rahmani, Y., Blank, A., Strauss, T., . . . Wylie-Rosett, J. (2013). Evaluation of a community-based weight management program for predominantly severely obese, difficult-to-reach, inner-city minority adolescents. *Childhood Obesity, 9*(4), 292-304. doi:10.1089/chi.2012.0147
- Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L., et al., (2003). Health consequences of obesity. *Archives of Diseases in Childhood 88*(9), 748-52.
- Reilly, J. J., & McDowell, Z. C. (2003). Physical activity interventions in the prevention and treatment of paediatric obesity: systematic review and critical appraisal. *Proceedings of the Nutrition Society, 62*(03), 611-619.
- Reinehr, T., Kiess, W., Kapellen, T., & Andler, W. (2004). Insulin sensitivity among obese children and adolescents, according to degree of weight loss. *Pediatrics, 114*(6), 1569-1573.
- Robertson, W., Stewart-Brown, S., Stallard, N., Petrou, S., Griffiths, F., Thorogood, M., ... & Kirby, J. (2013). Evaluation of the effectiveness and cost-effectiveness of Families for

Health V2 for the treatment of childhood obesity: study protocol for a randomized controlled trial. *Trials*, 14(1), 81.

- Rodearmel, S. J., Wyatt, H. R., Barry, M. J., Dong, F., Pan, D., Israel, R. G., ... & Hill, J. O. (2006). A family-based approach to preventing excessive weight gain. *Obesity*, 14(8), 1392-1401.
- Rosenkranz R.R, Dzewaltowski, D.A (2008). Model of the home food environment pertaining to childhood obesity. *Nutrition Reviews*, 66, 123–140.
- Ross, M. M., Kolbash, S., Cohen, G. M., & Skelton, J. A. (2010). Multidisciplinary treatment of pediatric obesity: Nutrition evaluation and management. *Nutrition in Clinical Practice: Official Publication of the American Society for Parenteral and Enteral Nutrition*, 25(4), 327-334. doi:10.1177/0884533610373771
- Rudolf, M., Christie, D., McElhone, S., Sahota, P., Dixey, R., Walker, J., & Wellings, C. (2006). WATCH IT: A community based programme for obese children and adolescents. *Archives of Disease in Childhood*, 91(9), 736-739. doi: 10.1136/adc.2005.089896
- Russell-Mayhew, S., McVey, G., Bardick, A., & Ireland, A. (2012). Mental health, wellness, and childhood overweight/obesity. *Journal of Obesity*, 2012, 281801. doi:10.1155/2012/281801
- Sacher, P. M., Kolotourou, M., Chadwick, P. M., Cole, T. J., Lawson, M. S., Lucas, A., & Singhal, A. (2010). Randomized controlled trial of the MEND program: A family-based community intervention for childhood obesity. *Obesity (Silver Spring, Md.)*, 18 Suppl 1(n1s), S62-S68. doi:10.1038/oby.2009.433
- Saelens, B. E., & Daniels, S. R. (2003). Childhood obesity: Causes and therapies. *Current Opinion in Endocrinology & Diabetes*, 10(1), 3-8. doi:10.1097/00060793-200302000-00002
- Saunders, K. L. (2007). Preventing obesity in pre-school children: A literature review. *Journal of Public Health*, 29(4), 368-375. doi:10.1093/pubmed/fdm061
- Sei, M., Nakatsu, T., Yuasa, K., Tanaka, H., Munakata, H., & Nakahori, Y. (2007). Prevalence of metabolic complications in children with severe obesity. *Pediatrics International*, 49(5), 545-552.
- Seidell, J. C., & Bouchard, C. (2000). The current epidemic of obesity. *Physical Activity and Obesity*, 2, 21-30.
- Shelton, D., Le Gros, K., Norton, L., Stanton-Cook, S., Morgan, J., & Masterman, P. (2007). Randomised controlled trial: A parent-based group education programme for overweight

children. *Journal of Paediatrics and Child Health*, 43(12), 799-805. doi:10.1111/j.1440-1754.2007.01150.

Shields, M. (2006). Overweight and obesity among children and youth. *Health Reports / Statistics Canada, Canadian Centre for Health Information = Rapports Sur La Santé / Statistique Canada, Centre Canadien d'Information Sur La Santé*, 17(3), 27.

Shields M, Tremblay M: Canadian childhood obesity estimates based on WHO, IOTF and CDC cut-points. *International Journal of Pediatric Obesity* 2010, 5, 265-73.

Singh, A. S., Mulder, C., Twisk, J. W. R., Van Mechelen, W., & Chinapaw, M. J. M. (2008). Tracking of childhood overweight into adulthood: A systematic review of the literature: Tracking of childhood overweight into adulthood. *Obesity Reviews*, 9(5), 474-488. doi:10.1111/j.1467-789X.2008.00475.x

Skelton, J. A., DeMattia, L. G., & Flores, G. (2008). A pediatric weight management program for high-risk populations: A preliminary analysis. *Obesity (Silver Spring, Md.)*, 16(7), 1698-1701. doi:10.1038/oby.2008.243

Sorg, M. J., Yehle, K. S., Coddington, J. A., & Ahmed, A. H. (2013). Implementing family-based childhood obesity interventions. *The Nurse Practitioner*, 38(9), 14.

Speiser, P. W., Rudolf, M. C., Anhalt, H., Camacho-Hubner, C., Chiarelli, F., Eliakim, A., ... & Hochberg, Z. (2005). Childhood obesity. *The Journal of Clinical Endocrinology & Metabolism*, 90(3), 1871-1887.

Stark, L. J., Spear, S., Boles, R., Kuhl, E., Ratcliff, M., Scharf, C., . . . Rausch, J. (2011). A pilot randomized controlled trial of a clinic and home-based behavioral intervention to decrease obesity in preschoolers. *Obesity (Silver Spring, Md.)*, 19(1), 134-141. doi:10.1038/oby.2010.87

Strauss, R. S. (2000). Childhood obesity and self-esteem. *Pediatrics*, 105(1), e15-e15.

Strauss, R. S., & Knight, J. (1999). Influence of the home environment on the development of obesity in children. *Pediatrics*, 103(6), e85-e85.

Summerbell, C.D., Ashton, V., Campbell, K.J., Edmunds, L., Kelly, S., Waters, E. (2003). Interventions for treating obesity in children. *Cochrane Database Systematic Review*:CD001872.

Tabacchi, G., Giammanco, S., La Guardia, M., Giammanco, M. (2007), A review of the literature and a new classification of the early determinants of childhood obesity: from pregnancy to the first years of life. *Nutrition Research*, 27, 587-604.

- Tang-Peronard J.L., & Heitmann B.L. (2008). Stigmatization of obese children and adolescents, the importance of gender. *Obesity Review*, 9: 1467–789.
- Twells, L. K., & Newhook, L. A. (2011). Obesity prevalence estimates in a Canadian regional population of preschool children using variant growth references. *BMC Pediatrics*, 11(1), 21-21. doi: 10.1186/1471-2431-11-21
- U.S. Department of Health and Human Services. Physical Activity Guidelines Advisory Committee Report, 2008. Washington (DC):U.S. Department of Health and Human Services; 2008. p. 683.
- Verhulst, S. L., Van Gaal, L., De Backer, W., & Desager, K. (2008). The prevalence, anatomical correlates and treatment of sleep-disordered breathing in obese children and adolescents. *Sleep Medicine Reviews*, 12(5), 339-346.
- Wang, Y., & Lobstein, T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity : IJPO : An Official Journal of the International Association for the Study of Obesity*, 1(1), 11-25. doi:10.1080/17477160600586747
- Whitaker, R.C., Wright, J.A., Pepe, M.S., Seidel, K.D., & Dietz, W.H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine*, 337(13):869–73.
- Weiss, R., Dziura, J., Burgert, T.S., Tamborlane, W.V., Taksali, S.E., Yeckel, C.W., et al.(2004).Obesity and the metabolic syndrome in children and adolescents. *New England Journal of Medicine*, 350(23):2362–74.
- Welsby, D., Nguyen, B., Blythe, J. O., Innes-Hughes, C., Bauman, A., & Hardy, L. L. (2014). Process evaluation of an up-scaled community based child obesity treatment program: NSW Go4Fun (R). *BMC Public Health*, 14(1), 140.
- West, F., Sanders, M. R., Cleghorn, G. J., & Davies, P. S. (2010). Randomised clinical trial of a family-based lifestyle intervention for childhood obesity involving parents as the exclusive agents of change. *Behaviour research and therapy*, 48(12), 1170-1179.
- Wills, M. (2004). Orthopedic complications of childhood obesity. *Pediatric physical therapy*, 16(4), 230-235.
- Woolford, S. J., Sallinen, B. J., Clark, S. J., & Freed, G. L. (2011). Results from a clinical multidisciplinary weight management program. *Clinical Pediatrics*, 50(3), 187-191. doi:10.1177/0009922810384845
- World Health Organization. *Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organization Technical Report Series*. Vol. 894, Geneva: WHO, 2000.

- Wrotniak, B. H., Epstein, L. H., Paluch, R. A., & Roemmich, J. N. (2004). Parent weight change as a predictor of child weight change in familybased behavioral obesity treatment. *Archives of Pediatric and Adolescent Medicine*, *158*, 342–347.
- Wrotniak, B. H., Epstein, L. H., Paluch, R. A., & Roemmich, J. N. (2005). The relationship between parent and child self-reported adherence and weight loss. *Obesity Research*, *13*, 1089–1096.
- Yin, R. K. (2000). Case study evaluations: a decade of progress?. In *Evaluation Models* (pp. 185-193). Springer Netherlands.
- Zeller, M. H., Saelens, B. E., Roehrig, H., Kirk, S., & Daniels, S. R. (2004). Psychological adjustment of obese youth presenting for weight management treatment. *Obesity Research*, *12*(10), 1576-1586.
- Zeller, M., Kirk, S., Claytor, R., Khoury, P., Grieme, J., Santangelo, M., & Daniels, S. (2004). Predictors of attrition from a pediatric weight management program. *The Journal of Pediatrics*, *144*(4), 466-470. doi:10.1016/j.jpeds.2003.12.031

## Appendix A

### Family-based childhood weight management programs

Author	Intervention	Setting	Description	Age	Measurement	Findings
Pinard et al., 2012	Smart Choices for Healthy Families: A Pilot Study for the Treatment of Childhood Obesity in Low-Income Families	Family-based	Smart Choices included six biweekly group sessions and six automated telephone-counseling calls over 3 months. Parental sessions and children sessions were conducted separately and after each class parents and children were engaged in physical activity session	8 to 12	Child body weight and composition, child body image, child quality of life	Mean decrease in the primary outcome: children's BMI z-score. Increase in child lean muscle mass. Children decrease in sugar-sweetened beverage consumption, parents increased vegetable intake, meal regularity, and healthy cooking, decrease in screen time. Parents showed an increase in vegetable intake, meal regularity, and healthy cooking, as well as a decrease in screen time
Janicke et al., 2011	a Group-Based Behavioral Family Intervention for Obese Children Enrolled in Medicaid: Outcomes by Race	Family-based	Group-based behavioral family group intervention. Child-parent assigned to the group-based BFI participated in 12 weekly, 90-min sessions over the course of 3 months. Each week a new knowledge and skills topic related to life style change was addressed. For all child and parent participants, the primary treatment objectives were to decrease caloric intake in a nutritionally sound manner and to increase moderate intensity exercise	6 to 12	Children and parents weight and height, BMI z- score	When examining only children assigned to the BFI, visual inspection of the data suggests that Caucasian children benefited from this program, whereas African American children did not appear to benefit from the program.

Golley et al., 2006	Twelve-Month Effectiveness of a Parent-led, Family-Focused Weight-Management Program for Pre-pubertal Children: A Randomized, Controlled Tri		An assessor-blinded, randomized, controlled trial involving 111 (64% female) overweight, pre-pubertal children of randomly assigned to parenting-skills training plus intensive lifestyle education.	6 to 9	Height, BMI, and waist-circumference z score and metabolic profile	After 12 months, the BMI z score was reduced by 10% with parenting skills training plus intensive lifestyle education versus 5% with parenting-skills training alone or wait-listing for intervention
Quattrin et al., 2012	Efficacy of family-based weight control program for preschool children in primary care	Family-based	Children with BMI $\geq$ 85th percentile and an overweight parent were randomized to intervention or information control (IC). Trained staff delivered dietary and physical/sedentary activities education to parents over 6 months	2 to 5	Height, weight, BMI, BMI z score, BMI SDS	Children in the intervention group had greater %BMI and z-BMI decreases at 3 and 6 months compared with those assigned to IC ( $P < .0021$ ).
Boles et al., 2010	Developing a Treatment Program for Obesity in Preschool-Age Children: Preliminary Data (LAUNCH)	Family-based/home setting	A 24-week behavioral weight management program consisted of: Phase I, Intensive Treatment, included 12 weekly sessions, alternating group-based clinic sessions, and home settings. Phase II, Maintenance, included 6 biweekly sessions alternating between the clinic and home settings.	2 to 5	Child and parent height, BMI and BMI z-score	Reduction in BMI-z score ranging from 0.18 to 0.99, parents weight reduction

Hughes et al., 2007	Randomized, Controlled Trial of a Best-Practice Individualized Behavioral Program for Treatment of Childhood Overweight: Scottish Childhood Overweight Treatment Trial (SCOTT)	family based/Hospital	An assessor-blinded, randomized, controlled trial involving 134 overweight children (BMI 98th centile) The intervention used family-centered counseling and behavioral strategies to modify diet, physical activity, and sedentary behavior. BMI z score, weight, objectively measured physical activity and sedentary behavior, fat distribution, quality of life, and height z score were recorded at baseline and at 6 and 12 months.	5 to 11	BMI z score. Height, weight, and waist circumference	No significant effect relative to standard care on BMI z-score, There were significant between-group differences in favor of the intervention for changes in total physical activity, percentage of time spent in sedentary behavior, and light-intensity physical activity.
Kalarchian et al., 2009	Family-Based Treatment of Severe Pediatric Obesity: Randomized, Controlled trial	Family based	The intervention consisted of 20 group meetings (60 minutes each) during months 0 to 6. Adult and child groups met separately and were presented with complementary material. Families were taught behavioral strategies to increase physical activity and to decrease sedentary behaviors,	8 to 12	BMI, Total fat, systolic Blood pressure, Diastolic blood pressure, ...	Intervention was associated with significant decreases in child percent overweight, relative to usual care, at 6 months. Intent-to treat analyses showed that intervention was associated with a 7.58% decrease in child percent overweight at 6 months, compared with a 0.66% decrease with usual care, but differences were not significant at 12 or 18 months

Rudolf et al., 2006	WATCH IT: a community based programme for obese children and adolescents	family-based/Community delivered	Frequent individual appointments (30 minutes, initially weekly) for the young person and parent for encouragement, support, and motivational counselling, using the HELP manual to guide content delivery, Group activity sessions lasting one hour, conducted weekly at a local sports centre.	8 to 16	BMI SDS	54% of children at 3 months and 71% at 6 months had shown a decrease in BMI SDS scores.
Sacher et al., 2010	Randomized Controlled Trial of the MEND Program: A Family-based Community Intervention for Childhood Obesity	community-based	One hundred and sixteen obese children (BMI $\geq$ 98th percentile, UK 1990 reference data) were randomly assigned to intervention or waiting list control (6-month delayed intervention). Parents and children attended eighteen 2-h group educational and physical activity sessions held twice weekly in sports centers and schools, followed by a 12-week free family swimming pass.	8 to 12	Waist circumference, BMI, body composition, physical activity level, sedentary activities, cardiovascular fitness, and self-esteem	Participants in the intervention group had a reduced waist circumference z-score ( $-0.37$ ; $P < .0001$ ) and BMI z-score ( $-0.24$ ; $P < .0001$ ) at 6 months when compared to the controls. Significant between-group differences were also observed in cardiovascular fitness, physical activity, sedentary behaviors, and self-esteem.
Smith et al., 2013	Assessing the short-term outcomes of a 5-7 program for overweight and obese children: The MEND community-based intervention for	family based/university of Pittsburgh medical center	10-week, family-based, child weight-management intervention consisting of weekly group sessions. It includes positive parenting, active play, nutrition education and behaviour change strategies.	5 to 7	Primary outcome: BMI z-score. Secondary outcome measures: BMI, waist circumference, waist circumference z-score, children's psychological symptoms, parenting self-efficacy, physical activity and sedentary behaviours	mean BMI and waist circumference decreased. Improvements were found in children's psychological symptoms

Sacher et al., 2005	Assessing the acceptability and feasibility of MEND program in a small group of obese 7-11 year old children	family based/sport center	3 months twice weekly	7 to 11	Weight circumference, self-esteem, cardiovascular fitness	Improved weight circumference, self-esteem, cardiovascular fitness at 3 and 6 months
West et al., 2010	Randomized clinical trial of a family-based lifestyle intervention for childhood obesity involving parents as exclusive agents of change	Parents Only	Group lifestyle triple P:12 week program, nine 90-min group sessions (Nutrition strategies, PA strategies, positive parenting strategies) and three 20-min telephone sessions ( Implementation of strategies and problem solving)	4 to 11	BMI z score, LCB problem, LCB (lifestyle behavior confidence), PS total	Improvement in children body size, Increased in parental confidence in managing child behavior
Vignolo et al., 2008	Five year follow-up of a cognitive-behavioral lifestyle multidisciplinary program for childhood obesity outpatient treatment	Family-based	Cognitive behavioral techniques, Nutrition education, and promotion of PA	6 to 12	Weight, BMI SDS, , waist circumference, Height, waist circumference, BMI,	
Davison et al., 2013	A childhood obesity intervention developed by families for families: results from a pilot study	Family-centered	Year 1: Parents and Researchers Planned the intervention , Year 2: Implementing and evaluating the intervention (pre-post cohort design), Intervention Component: Revisions the letters sent to families reporting child BMI, Campaign to raise awareness among parents, Nutrition counseling, 6 weeks parent-led program to empower parents, Child program	2 to 5	BMI z score, child PA time, dietary intake, child TV viewing.	Improvement in rate of obesity, light PA, daily TV viewing and dietary intake.
Danielsen et al., 2012	A family-based intervention to improve Children BMI, Self-esteem and depression syndrome in Children	Family-based	12 week program for obese children and their families. Treatment included 12 weekly individual family meetings and 6 booster sessions.	7 to 13		Improvement in children's post-intervention BMI
Chen et al., 2013		Family-based	Eight week play-based childhood obesity intervention	7to 12		79% of the children reported eating more fruit and vegetables and 68% reported being more active

## Appendix B



### *Participant Consent Form*

---

#### **MEND Childhood Healthy Weights Program Evaluation**

You are invited to participate in the **MEND Research Study** because your family is participating in the Mind, Exercise, Nutrition, Do It! (MEND) program and its evaluation. The research study is being carried out by Dr. PJ Naylor, who is also serving as an advisor for MEND program delivery and evaluation in BC, in collaboration with Dr. Jean Pierre Chanoine of the University of British Columbia/British Columbia Children's Hospital. You may contact them by phone or e-mail (Dr. Naylor: 250-721-7844, [pjnaylor@uvic.ca](mailto:pjnaylor@uvic.ca); Dr. Chanoine: 604-875-2624, [jchanoine@cw.bc.ca](mailto:jchanoine@cw.bc.ca)) if you have further questions.

The MEND Program is being conducted by the Childhood Obesity Foundation through funding from the BC Ministry of Health.

#### **Purpose and Objectives**

The purpose of the evaluation and study is to evaluate the reach and efficacy of the MEND program in BC as well as gain an understanding of the issues involved in the implementation and sustainability of delivering this intervention across the province.

#### **Importance of this Evaluation**

Evaluation and research of this type is important because it helps us understand how to help families adopt a healthy lifestyle that keeps them on a healthy weight trajectory.

#### **What is involved**

If you consent to voluntarily participate in the research component, the research team will have access to the information you provide the MEND staff on your questionnaires and physical measures (height, weight, waist circumference and step test). Your information will be combined with others for evaluation purposes: There will be no information in the evaluation results that will be personally identifiable. These measures are all a normal part of the MEND program. In addition to these you may be asked to participate in a post-program focus group or interview to get your opinion on the program. The research team would also have access to the transcripts from this focus group if you have participated.

#### **Inconvenience**

Participation in this research will not cause any additional inconvenience to you as we are using the data you provide through the MEND program evaluation, including the one hour post-program interview or focus group.

#### **Risks**

None.

#### **Benefits**

The potential benefits of your participation in the MEND program include weight loss, increased self-esteem, increased health and wellness for your child. By participating in the evaluation you are contributing to the evidence of MEND's ability to help children and families adopt a healthy lifestyle and stay on a healthy weight trajectory.

### **Voluntary Participation**

Your participation in this research is completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study you can choose to allow us to use your/your child's data collected to date or to not use it. If at any time you choose to withdraw consent, your preference for the use of your data will be documented and your request honoured.

### **On-going Consent**

To make sure that you continue to consent to participate in the research component, we will re-confirm your consent when we do physical measures at session 19 and when we contact you for the focus group.

### **Anonymity**

In terms of protecting your anonymity there will be no identifying names on any of your/ your child's records. Your name/your child's name will be replaced by unique identification numbers.

### **Confidentiality**

Your confidentiality and the confidentiality of the data will be protected by having no participant names on any of the data. As well, hard copies of the data will be stored in a locked filing cabinet in a locked room at the MEND site. Electronic files will be stored using your unique identification numbers on a secure network drive at the University of Victoria which is accessible only to the principal investigator and research staff. At the focus group, code numbers will be used to identify your comments. Due to the nature of focus groups your comments are not entirely confidential, as other participants at the focus group will hear what you say. All focus group participants will be asked not to repeat what others in the focus group say and to keep each other's comments confidential. Notes will be taken and the interview may be audio-taped and will be transcribed for further analysis. Only the researchers will have access to the tapes and transcripts.

### **Dissemination of Results**

It is anticipated that the results of this evaluation/ study will be shared with others through presentations at conferences, a report and through academic publications.

### **Disposal of Data**

The Uvic research team will receive only the de-identified questionnaire, physical measures (height, weight, waist circumference and step test) and focus group data. This data will be disposed of one year following publication. If the results are not published within 5 years of completing the evaluation, the data will be destroyed. Hard copies will be shredded and any computer files with participant information will be deleted.

Individuals that may be contacted regarding this evaluation/ study include:

Dr. PJ Naylor  
Principal investigator  
250-721-7844  
[pjnaylor@uvic.ca](mailto:pjnaylor@uvic.ca)

Dr. Karen Strange  
MEND Provincial Manager  
250-216-7893  
[kstrange@uvic.ca](mailto:kstrange@uvic.ca)

Dr. Jean-Pierre Chanoine  
Co-investigator  
604-875-2624  
[jchanoine@cw.bc.ca](mailto:jchanoine@cw.bc.ca)

In addition, you may verify the ethical approval of this evaluation/ study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or [ethics@uvic.ca](mailto:ethics@uvic.ca)) or the Research Subject Information Line in the University of British Columbia Office of Research Services by email at [RSIL@ors.ubc.ca](mailto:RSIL@ors.ubc.ca) or by phone at 604-822-8598 (Toll Free Number 1-877-822-8598).

Your signature below indicates that you understand the above conditions of participation in this evaluation/ study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this evaluation/ study.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Child's Statement:**

I have talked with my parents/guardians about the MEND program evaluation/ study and I understand that all activities are a normal part of the MEND program evaluation. I understand that if I want to I can stop being in the research evaluation at any time and I will still be able to participate in all of the MEND activities. I have had the chance to ask questions and have received satisfactory answers to all of my questions.

\_\_\_\_\_  
Signature of Child

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of child

***A copy of this consent will be left with you, and a copy will be taken by the researcher.***

## Appendix C Demographics

### MEND 5-7 participant information form

This form should be completed by the participating child's **parent or primary caregiver**.

<b>Participant information</b>			
We will use the information you provide here to contact you. It is very important that we have at the very least your cell phone number. We will not give your personal information to anyone without asking your permission first.			
<b>MEND has very strict data protection and privacy policies</b> ( <a href="http://www.mendcentral.org/privacypolicy">www.mendcentral.org/privacypolicy</a> )			
Please provide any missing information and correct any mistakes.			
<b>Child's name</b>	<<Childs FULL name>>		
<b>Date of birth</b>	<<DOB>>	<b>Gender</b>	<<Gender>>
<b>School name</b>	<<School>>	<b>Year</b>	<<Year>>
<b>Parent/caregiver's name</b>	<<Parents full name>>	<b>Relationship to the child</b>	<<Relation>>
<b>Address</b>	<<Address>>	<b>Postal code</b>	<<Postcode>>
<b>Cell phone number</b>	<<Cell No>>	<b>Home number</b>	<<Home No>>
<b>Contact email</b>	<Email>		
<b>Child's Doctor's information</b>			
<b>Family physician's name and practice</b>	Dr <<FP name>> <<FP practice name>>		
<b>Address</b>	<<FP address>> <<FP City>>		
<b>Postal code</b>	<<FP Postcode>>	<b>Phone</b>	<<FP Phone>>

- j. West Asian (eg Afghan, Iranian)
- k. Japanese
- l. Korean
- m. Other. Please specify: \_\_\_\_\_

C. What language(s) do you speak most often at home?

- a. English
- b. French
- c. Chinese languages (Cantonese, Mandarin, Hakka, Fukien, Taiwanese)
- d. German
- e. Punjabi
- f. Tagalog (Filipino/Pilipino)
- g. Spanish
- h. Hindi
- i. African languages
- j. Somali
- k. Arabic
- l. Vietnamese
- m. Korean
- n. Urdu
- o. Aboriginal languages (Cree, Blackfoot, Ojibway)
- p. Other. Please specify: \_\_\_\_\_

The following questions use the term “household.” For the questionnaire, “household” refers to the people living at the same place who are supported by the same source(s) of income.

D. Is the primary earner of the household:

- a. Employed
- b. Unemployed – currently looking for work
- c. Unemployed – currently not looking for work
- d. Prefer not to answer

E. What is your best estimate of the total income received by all household members, from all sources, before taxes and deductions, in the past 12 months? Income can come from various sources such as from work, investments, pensions or government. Examples include Employment Insurance, Social Assistance, Child Tax Benefit and other income such as child support, alimony and rental income. Is your household income in the past year:

- a. Less than \$28,000
- b. \$28,000 to less than \$34,000
- c. \$34,000 to less than \$41,000
- d. \$41,000 to less than \$47,000
- e. \$47,000 to less than \$53,000
- f. \$53,000 to less than \$59,000
- g. \$59,000 or more
- h. Prefer not to answer

F. What is the highest level of education achieved by the primary caregiver of your child?

- a. Finished grade 8
- b. Finished grade 10
- c. High school certificate
- d. Trade certificate or diploma from a vocational school or apprenticeship training
- e. Non-university certificate or diploma from a community college
- f. University certificate below bachelor's level
- g. Bachelor's degree
- h. University degree or certificate above bachelor's degree
- i. Prefer not to answer

G. How many adults and children live in your household? Please count yourself as an adult. If you are pregnant, please indicate the baby you are carrying as a child:

- a. \_\_\_\_\_ adult(s)
- b. \_\_\_\_\_ child(ren)
- c. Prefer not to answer

### MEND 5-7 Social Data

This form should be completed by the participating child's **parent or primary caregiver**. MEND is committed to reaching all groups, irrespective of gender, location, economic means or ethnicity. The information you provide will help to ensure we are reaching all sections of the community and providing services to meet the community's needs.

We therefore request that you answer **all** the following questions.

**Remember this information is strictly confidential**  
**([www.mendcentral.org/privacypolicy](http://www.mendcentral.org/privacypolicy))**

A. Do you consider yourself a single parent?

- a. Yes
- b. No
- c. Prefer not to answer

B. People living in Canada came from many different cultural and racial backgrounds.

Is your child (please choose all that apply):

- a. An Aboriginal person (eg First Nations, Métis, or Inuit)
- b. White
- c. Chinese
- d. South Asian (eg East Indian, Pakistani, Sri Lankan)
- e. Black
- f. Filipino
- g. Latin American
- h. Southeast Asian (eg Cambodian, Indonesian, Laotian, Vietnamese)
- i. Arab

## Appendix D

## MEND 5-7 Medical questionnaire

This form should be completed by the participating child's **parent or primary caregiver**.

We will send a letter to your family physician or paediatrician to inform them of your child's participation in the MEND 5-7 program. **Please provide information about your child's medical history below:**

	Yes	No
1. Does your child have any allergies, including food allergies?	<input type="checkbox"/>	<input type="checkbox"/>
2. Has your child ever needed to see a psychiatrist, psychologist or counsellor?	<input type="checkbox"/>	<input type="checkbox"/>
3. Has your child been diagnosed with any type of behavioural or psychological problem (including learning difficulties)?	<input type="checkbox"/>	<input type="checkbox"/>
4. Does your child have any visual/hearing disabilities?	<input type="checkbox"/>	<input type="checkbox"/>
5. Does your child have any other disabilities?	<input type="checkbox"/>	<input type="checkbox"/>
6. Is your child currently on any medication?	<input type="checkbox"/>	<input type="checkbox"/>
7. Does your child have any upcoming scheduled tests, or are they waiting for results from any tests completed, to rule out any possible medical condition(s)?	<input type="checkbox"/>	<input type="checkbox"/>
8. Is your child currently following a special diet prescribed by a dietitian?	<input type="checkbox"/>	<input type="checkbox"/>
9. Has the doctor ever said that your child has a heart condition <u>and</u> that your child should only do physical activity recommended by a doctor?	<input type="checkbox"/>	<input type="checkbox"/>
10. Does your child ever feel pain in his/her chest when he/she participates in physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
11. In the past month, has your child had chest pain when he/she was not participating in physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
12. Does your child lose his/her balance because of dizziness or does he/she ever lose consciousness?	<input type="checkbox"/>	<input type="checkbox"/>
13. Does your child have a bone or joint problem (for example, back, knee, or hip) that could be made worse by a change in his/her physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
14. Is your child's doctor currently prescribing drugs for your child's blood pressure or heart condition (for example, water pills)?	<input type="checkbox"/>	<input type="checkbox"/>
15. Do you know of <u>any other reason</u> why your child should not participate in physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
16. If you answered "yes" to any of questions 1 to 15, please provide detail below.		
<p><b>If you have answered "yes" to any of questions 1 to 15, you will need to contact your child's doctor for their approval to ensure your child can safely participate in MEND 5-7.</b></p>		
17. Please provide any other relevant medical information that may impact your child's participation in MEND 5-7.		

## Appendix E

### MEND 5-7 Physical activity questionnaire

#### Section A: outdoor playtime checklist

1. During yesterday, how much time did your child spend playing in the yard or street around your house (or the house of a friend, neighbour, or relative)?

a) Wake-up time until noon

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

b) Noon until 6pm

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

c) 6pm until bedtime

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

2. During yesterday, how much time did your child spend playing at a park, playground, or outdoor recreation area (for example, swimming pool, zoo, or amusement park), including while at day care or school?

a) Wake-up time until noon

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

b) Noon until 6pm

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

c) 6pm until bedtime

0 min  1-15 min  16-30 min  31-60 min  Over 60 min

#### Section B: playtime recall questions

Think for a moment about a typical weekday for your child in the past month.

1. How much time would you say your child spends playing outdoors on a typical weekday?

hour(s)  minutes **per day**

2. How much time would you say your child spends playing active games indoors (e.g., building a fort) on a typical weekday?

hour(s)  minutes **per day**

3. How much time would you say an adult in your family plays active games with your child (either indoors or outdoors) or does active things together (e.g., walking) on a typical weekday?

hour(s)  minutes **per day**

Think for a moment about a typical weekend day for your child in the past month.

1. How much time would you say your child spends playing outdoors on a typical weekend day?

hour(s)  minutes **per day**

2. How much time would you say your child spends playing active games indoors (e.g., building a fort) on a typical weekend day?

hour(s)  minutes **per day**

3. How much time would you say an adult in your family plays active games with your child (either indoors or outdoors) or does active things together (e.g., walking) on a typical weekend day?

hour(s)  minutes **per day**

### Section C: TV time and computer games recall questions

Think for a moment about a typical weekday for your child in the past month.

1. How much time would you say your child spends watching television (including videos and DVD's), including time spent watching TV in other people's houses? (*Note – if none please indicate by writing 0*)

hour(s)  minutes **per day**

2. How much time did your child spend playing Play-Station/X-box/Nintendo/Computer games (including watching a friend/brother/sister/adult play, and at other people's houses)? (*Note – if none please indicate by writing 0*)

hour(s)  minutes **per day**

Think for a moment about a typical weekend day for your child in the past month.

1. How much time would you say your child spends watching television (including videos and DVD's), including time spent watching TV in other people's houses? (*Note – if none please indicate by writing 0*)

hour(s)  minutes **per day**

2. How much time did your child spend playing Play-Station/X-box/Nintendo/Computer games (including watching a friend/brother/sister/adult play, and at other people's houses)? (*Note – if none please indicate by writing 0*)

hour(s)  minutes **per day**

### Section D:

In your opinion, how physically active is your child compared to other children of his/her age? (Please circle one)

- a) Much less active
- b) Less active
- c) Same
- d) More active
- e) Much more active

## Appendix F

### MEND 5-7 Nutrition questionnaire

This questionnaire asks about the eating and drinking habits of your family. Your answers to these questions will help us understand what children and families eat. Please complete the questions yourself or with the help of others who take care of your child. Please check one answer for each question about your child's usual habits.

<b>Please select your relationship to the MEND participant:</b>					
Mother <input type="checkbox"/>	Father <input type="checkbox"/>	Brother <input type="checkbox"/>	Sister <input type="checkbox"/>	Grandparent <input type="checkbox"/>	Other <input type="checkbox"/>

#### About my child:

1. How often does your child eat breakfast?

- |                           |                  |
|---------------------------|------------------|
| a. Never                  | g. 4 days a week |
| b. Less than once a month | h. 5 days a week |
| c. Less than once a week  | i. 6 days a week |
| d. Once a week            | j. 7 days a week |
| e. 2 days a week          |                  |
| f. 3 days a week          |                  |

2. How many cups of fluids (include water and other drinks) does your child have on an average day? Please note that 1 cup = 250mL or about the size of a baseball.

- 1 cup or less (250 mL or less)
- 2 cups (500 mL)
- 3 cups (750mL)
- 4 cups (1 L)
- 5 cups (1.250 L)
- 6 cups (1.500 L)
- 7 cups (1.750 L)
- 8 cups or more (2.000 L or more)

2a. Consider the fluids your child drinks in a day. How many cups are water?

- 1 cup or less (250 mL or less)
- 2 cups (500 mL)
- 3 cups (750mL)
- 4 cups (1 L)
- 5 cups (1.250 L)
- 6 cups (1.500 L)
- 7 cups (1.750 L)
- 8 cups or more (2.000 L or more)

2b. Consider the fluids your child drinks in a day. How many cups are unsweetened, 100% fruit or vegetable juice?

- a. ½ cup or less (125mL or less)
- b. 1 cup (250mL)
- c. 1½ cups (375mL)
- d. 2 cups (500mL)
- e. 2½ cups (625 mL)
- f. 3 cups or more (750 mL or more)

2c. Consider the fluids your child drinks in a day. How many cups are milk or milk alternatives?

- a. 1 cup or less (250 mL or less)
- b. 2 cups (500 mL)
- c. 3 cups (750mL)
- d. 4 cups or more (1 L or more)

2d. What type of milk and milk alternatives does your child drink most often?

- a. Skim milk
- b. 1% milk
- c. 2% milk
- d. Homogenized milk (whole milk)
- e. Chocolate milk or other flavoured milks, fortified soy beverages with/without added sugar flavour
- f. My child does not drink milk or milk alternatives

3. My child drinks sweet beverages such as pop, iced tea, drink crystals, juice beverages and drinks, and hot chocolate:

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

4. My child eats fried potato products (French fries, fried potato wedges, potato chips):

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

5. My child eats candy or chocolate:

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

6. My child eats baked or fried desserts such as cakes, cookies, muffins, pastries, donuts:

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

7. My child eats other desserts such as puddings, fruit jelly, ice-cream, frozen novelties:

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

8. How many servings of vegetables and fruit does your child eat (including 100% juices) in a day? Do not count fried potato products such as French fries, potato wedges, or potato chips. A serving is  $\frac{1}{2}$  cup (125mL) of fresh, frozen or canned vegetables or fruit,  $\frac{1}{2}$  cup (125mL) of 100% juice or one piece of fruit.

\_\_\_\_\_ serving(s)

**About your family:**

9. How often does your family cook from scratch at home, that is, using fresh or frozen ingredients instead of packaged or ready to serve food?

- a. Never
- b. Less than once a month
- c. Less than once a week
- d. Once a week
- e. A few times a week
- f. Once a day
- g. A few times a day

**About you:**

10. How many servings of vegetables and fruit do you eat (including 100% juices) in a day? Do not count fried potato products such as French fries, potato wedges, or potato chips. A serving is ½ cup (125mL) of fresh, frozen or canned vegetables or fruit, ½ cup (125mL) of 100% juice or one piece of fruit.

\_\_\_\_\_ serving(s)

11. How often do you understand the Nutrition Facts Table on food and drink packages?

Never

Rarely – about a quarter of the time

Sometimes – about half the time

Often – about three quarters of the time

Always

12. How often do the Nutrition Facts Tables on food and drink help you make your purchase decisions?

Never

Rarely – about a quarter of the time

Sometimes – about half the time

Often – about three quarters of the time

Always

13. I am happy with the variety (types) of food my child eats

a. Not at all (very unhappy)

b. Somewhat unhappy

c. Somewhat happy

d. Very happy

**How my child eats:**

	<b>Never</b>	<b>Rarely</b>	<b>Some- times</b>	<b>Often</b>	<b>Always</b>
14. Is your child a picky eater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Does your child watch TV at meals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Is it hard for your child to eat new foods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Do you have to make special meals for your child because he/she is a picky eater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Is it a struggle to get your child to eat?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Do you feed your child yourself if he/she did not eat enough?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Do you have to stop your child from eating too much?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Do you think about putting your child on a diet to keep him/her from becoming overweight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Do you have a set mealtime and snack routine?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. At dinner, do you let your child choose the foods he/she wanted from what is served?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Do you make your child eat all the food on his/her plate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Do you offer your child dessert after a meal to get him/her to eat foods that are good for them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. When your child is fussy, is giving him/her something to eat or drink the first thing you do?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Do you ever punish or remove privileges to get your child to eat more?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Do you give your child something to eat or drink if he/she is bored even if you think he/she is not hungry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. Do you get upset if your child does not eat enough?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Do you worry that your child is eating too much?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Do you use foods that your child likes as a way to get him/her to eat "healthy" foods he/she does not like?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Do you make your child finish all his/her dinner before he/she could have a dessert?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Do you get upset if your child eats too much?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Do you give your child something to eat or drink if he/she is upset even if you think he/she is not hungry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Does your child have a poor appetite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Do you sit down with your child when he/she eats meals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. If your child does not like what is being served, do you make something else?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Do you allow your child to eat snacks whenever he/she wants?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Disagree a lot</b>	<b>Disagree a little</b>	<b>No strong feelings either way</b>	<b>Agree a little</b>	<b>Agree a lot</b>
39. Offering my child something to eat is one of the best things to stop his/her temper tantrums.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. I am worried that my child will become overweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. I am worried that my child will become underweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. I am worried that my child will have to diet to stay a healthy weight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. I am worried that my child is underweight right now.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. I am worried that my child is overweight right now.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix G

### MEND 5-7 Parent questionnaire: strengths and difficulties

This form should be completed by the participating child's **parent or primary caregiver**. For each question, please mark the box for **Not True**, **Somewhat True** or **Certainly True** as they relate to your child. It will help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your child's behaviour over the last month.

Please make sure the <b>same person</b> completes this questionnaire at the end of the program				
		Not true	Somewhat true	Certainly true
1.	Considerate of other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Restless, overactive, cannot sit still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Often complains of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Shares readily with other children (treats, toys, pencils, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Often has temper tantrums or loses his/her temper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Rather solitary, tends to play alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Generally obedient, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Many worries, often seems worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Has at least one good friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Often unhappy, downhearted or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Generally liked by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Nervous or clingy in new situations, easily loses confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Often lies or cheats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Picked on or bullied by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Often volunteers to help others (parents, teachers, other children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Thinks things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	Steals from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	Gets along better with adults than with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	Many fears, easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	Sees tasks through to the end, good attention span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix H

## MEND 5-7 Parenting questionnaire

About you as a parent										
Using the scale below, please enter in the boxes how much you agree with each statement. The scale ranges from 0 (completely disagree) to 10 (completely agree). You may use any number between 0 and 10. Please answer <u>all</u> statements:										
0	1	2	3	4	5	6	7	8	9	10
Completely disagree			Moderately agree				Completely agree			
<b>Play and enjoyment</b>										
I am able to have fun with my child.										
0	1	2	3	4	5	6	7	8	9	10
I am able to enjoy each stage of my child's development.										
0	1	2	3	4	5	6	7	8	9	10
I am able to have nice days with my child.										
0	1	2	3	4	5	6	7	8	9	10
I can plan activities that my child will enjoy.										
0	1	2	3	4	5	6	7	8	9	10
Playing with my child comes easily to me.										
0	1	2	3	4	5	6	7	8	9	10
I am able to help my child reach their full potential.										
0	1	2	3	4	5	6	7	8	9	10
<b>Discipline and setting boundaries</b>										
Setting limits and boundaries is easy for me.										
0	1	2	3	4	5	6	7	8	9	10
I am able to stick to the rules I set for my child.										
0	1	2	3	4	5	6	7	8	9	10
I am able to reason with my child.										
0	1	2	3	4	5	6	7	8	9	10

I can find ways to avoid conflict.										
0	1	2	3	4	5	6	7	8	9	10
I am consistent in the way I use discipline.										
0	1	2	3	4	5	6	7	8	9	10
I am able to discipline my child without feeling guilty.										
0	1	2	3	4	5	6	7	8	9	10
<b>Learning and knowledge</b>										
I am able to recognise developmental changes in my child.										
0	1	2	3	4	5	6	7	8	9	10
I can share ideas with other parents.										
0	1	2	3	4	5	6	7	8	9	10
I am able to learn and use new ways of dealing with my child.										
0	1	2	3	4	5	6	7	8	9	10
I am able to make the changes needed to improve my child's behaviour.										
0	1	2	3	4	5	6	7	8	9	10
I can overcome most problems with a bit of advice.										
0	1	2	3	4	5	6	7	8	9	10
Knowing that other people have similar difficulties with their children makes it easier for me.										
0	1	2	3	4	5	6	7	8	9	10

**Thank you for completing the questionnaires**






## Appendix I

### MEND 5-7 Feedback form for parents/caregivers






This form should be completed by the participating child's **parent or caregiver**.

Thank you very much for participating in the MEND 5-7 program. We hope you and your child enjoyed it! As we are continually improving the MEND 5-7 program, your feedback is very important to us. Please read the statements below and indicate how much you agree or disagree with each.

#### A. Overall program feedback

Taking part in MEND 5-7 has helped me to . . .					
Give my child a wider variety of vegetables and fruits	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Reduce the amount of milk I give my child between snacks and meals	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Understand appropriate serving sizes for my child	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Be more aware of number of treat foods my child eats such as pop, chips and candy	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Be more aware of the number of hours of recreational screen time my children watches a day	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Change my <u>eating</u> habits to be a better role model for my child	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Change my <u>activity</u> habits to be a better role model for my child	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Understand the physical activity guidelines and how to encourage my child to be active	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Change how I introduce new foods	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>

Use the power food wiggle and ready, steady, eat when introducing new foods at home	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
---	---	--------------------------------------	-------------------------------------	-----------------------------------	--

After attending MEND 5-7 . . .					
My child's confidence has improved	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
My relationship with my child has improved	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
I feel less stressed about feeding my child	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
I am more aware of the benefits of healthy eating on my child's health	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
I am more aware of the benefits of increased physical activity on my child's health	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
I feel more confident about my ability to raise a healthy child	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Comments:					

<b>MEND 5-7 integrates principles and expertise in nutrition, physical activity and behaviour change. Please indicate whether you think the balance is right for each part of the program.</b>			
Nutrition	Wanted less <input type="checkbox"/>	Right amount <input type="checkbox"/>	Wanted more <input type="checkbox"/>
Physical activity	Wanted less <input type="checkbox"/>	Right amount <input type="checkbox"/>	Wanted more <input type="checkbox"/>
Behaviour change (i.e., parenting strategies and techniques)	Wanted less <input type="checkbox"/>	Right amount <input type="checkbox"/>	Wanted more <input type="checkbox"/>
<b>Please answer the following questions about the MEND 5-7 program.</b>			
Were the handouts useful?	Not at all <input type="checkbox"/>	Somewhat <input type="checkbox"/>	Very <input type="checkbox"/>
Were enough handouts provided?	Wanted less <input type="checkbox"/>	Right amount <input type="checkbox"/>	Wanted more <input type="checkbox"/>
Did you learn anything new about living a healthy lifestyle through the information provided by MEND 5-7?			
What was the most important thing, if any, you learned through MEND 5-7?			
Which pieces of information should not be covered by MEND 5-7 in the future?			
Were there any topics you expected to be covered that weren't?			

## B. Rating individual sessions

In this section, we want you to think about each session and tell us (1) if you liked it or not, and (2) if you found the session helped you learn about living a healthy life.

Please choose a number that corresponds with what you think using a scale of 1 to 5, with:  
**1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 =strongly agree**

Please circle one number per column for each session you attended. If you were unable to attend a particular session, please leave the row blank.

Session Name	I liked it...	This session helped me learn about living a healthy life...
1. Introduction and healthy growth check 1	1 2 3 4 5	1 2 3 4 5
2. Regular eating and healthy habits for my child	1 2 3 4 5	1 2 3 4 5
3. What should my family eat	1 2 3 4 5	1 2 3 4 5
4. Child's play	1 2 3 4 5	1 2 3 4 5
5. Encouraging healthy mealtimes	1 2 3 4 5	1 2 3 4 5
6. Serving sizes	1 2 3 4 5	1 2 3 4 5
7. MEND Detective – what's in my family's food	1 2 3 4 5	1 2 3 4 5
8. Active Families	1 2 3 4 5	1 2 3 4 5
9. How to create a MEND-friendly home	1 2 3 4 5	1 2 3 4 5
10. Welcome to MEND World and healthy growth check 2	1 2 3 4 5	1 2 3 4 5

### C. Rating the overall MEND 5-7 program

In this section, we want know a little bit more about what you think of MEND 5-7 in general. Please tell us (1) if you liked different parts of the MEND, and (2) if you found that part helped your family apply what you have learned about living a healthy life.

Please choose a number that corresponds with what you think using a scale of 1 to 5, with:

**1 = strongly disagree    2 = disagree    3 = undecided    4 = agree    5 =strongly agree**

Please circle one number per column for each part of MEND.

Parts of MEND	I liked it...					This part helped my family apply what we have learned about living a healthy life...				
Power time (snack time)	1	2	3	4	5	1	2	3	4	5
Healthy families sessions	1	2	3	4	5	1	2	3	4	5
Parent/caregiver sessions	1	2	3	4	5	1	2	3	4	5
Active play sessions for children	1	2	3	4	5	1	2	3	4	5
MEND handouts for parents and caregivers	1	2	3	4	5	1	2	3	4	5
MEND backpack with T-shirt, ball, and binder	1	2	3	4	5	1	2	3	4	5
MEND's approach that combines behaviour change, exercise, and nutrition	1	2	3	4	5	1	2	3	4	5
Family power challenges and group progress chart	1	2	3	4	5	1	2	3	4	5
Group format	1	2	3	4	5	1	2	3	4	5

### D. Rating your child's experience in MEND 5-7?

We would like to know if your child enjoyed MEND 5-7. Please select the option that you feel best describes your child's experience.

- My child had fun on MEND 5-7?  
 Strongly disagree     Disagree     Not sure     Agree     Strongly agree
- My child liked the MEND Health Families leaders?  
 Strongly disagree     Disagree     Not sure     Agree     Strongly agree
- My child liked the MEND Active Play leaders?  
 Strongly disagree     Disagree     Not sure     Agree     Strongly agree
- My child liked the MEND Power Time leaders?  
 Strongly disagree     Disagree     Not sure     Agree     Strongly agree

### E. Rating the information provided by MEND 5-7

We want to find out more about what you think of the information that you were given before and during the program.

#### Information given before the program

Were you provided with enough information about the MEND 5-7 program when the program manager called you?

Yes

No (If no, please tell us what additional information you would like to have had):

---



---



---

Was the program information you were given accurate?

Yes

No (If no, please tell us which information was not correct):

---



---



---

#### Information given during the program

Using a scale of 1 to 5, with:

**1 = strongly disagree    2 = disagree    3 = undecided    4 = agree    5 =strongly agree**

Was the information:	<b>Information given in sessions</b>					<b>Information given in handouts</b>				
Easy to understand?	1	2	3	4	5	1	2	3	4	5
Easy to act upon?	1	2	3	4	5	1	2	3	4	5
Enough for you to make healthy eating and activity changes?	1	2	3	4	5	1	2	3	4	5
Appropriate for your family's financial situation?	1	2	3	4	5	1	2	3	4	5
Culturally suitable for your family?	1	2	3	4	5	1	2	3	4	5
Appropriate for your community?	1	2	3	4	5	1	2	3	4	5
Suitable for Canadians in general?	1	2	3	4	5	1	2	3	4	5

### F. Rating the MEND 5-7 program delivery

In this section, we want to find out more about what you think of how MEND 5-7 was delivered. Please rate the program using a scale of 1 to 5, with 1 being “not at all” and 5 being “definitely.”

MEND 5-7...	Not at all				Definitely
Took place in a location that was easy to access	1	2	3	4	5
Took place in a location that was suitable for program activities	1	2	3	4	5
Had enough leaders and assistants to run the program smoothly	1	2	3	4	5
Had a knowledgeable Healthy families session leader	1	2	3	4	5
Had a knowledgeable Parent/caregiver session leader	1	2	3	4	5
Had an effective Active play leader	1	2	3	4	5
Sessions started on time	1	2	3	4	5
Individual session length was appropriate (105 minutes)	1	2	3	4	5
Weekly sessions were frequent enough (once a week)	1	2	3	4	5
Overall program length was appropriate (10 weeks)	1	2	3	4	5

1. Was there anything that made it difficult for your family to attend any of the MEND 5-7 sessions (e.g., transportation, scheduling)?
2. Was there anything that made it easier for your family to attend the MEND 5-7 sessions (e.g., including siblings in the activities, free program)?
3. What do you think will make it easier for other families to attend the MEND 5-7 program in the future?
4. In your opinion, which part(s) of MEND 5-7 went well?
5. In your opinion, which part(s) of MEND 5-7 did not run smoothly?

**G. Rating the impacts of MEND 5-7**

In this section, we would like to find out more about MEND 5-7's impact on your family.

1. Did your family make any changes towards a healthy lifestyle during MEND 5-7?  
 Definitely     I think so     I don't know     I don't think so     Definitely not
2. What changes, if any, did your family make while attending MEND 5-7?
3. Is your family planning to make any changes towards a healthy lifestyle after MEND 5-7?  
 Definitely     I think so     I don't know     I don't think so     Definitely not
4. What changes, if any, will your family make?
5. Do you feel your family can maintain changes made during MEND 5-7?  
 Definitely     I think so     I don't know     I don't think so     Definitely not
6. What was the one thing you liked the most about MEND 5-7?
7. What would you like to change about MEND 5-7?
8. What would you tell other families about MEND 5-7?
9. Overall, are you satisfied with your MEND 5-7 experience?

**Thank you for completing this questionnaire.**

## Appendix J

### MEND 5-7 Training feedback form

Training date:

Training venue:

1) Trainer's delivery of information (i.e. was it clear).

4. Very effective  3. Effective  2. Neutral  1. Not effective

2) Visual presentation of information (i.e. power point presentation)

4. Very effective  3. Effective  2. Neutral  1. Not effective

3) Management of attendees to maximize learning opportunities (i.e. group skills)

4. Very effective  3. Effective  2. Neutral  1. Not effective

4) Training Venue

5) Any other comments .....

6) MEND 5-7 overview

4. Very easy to understand  3. Easy to Understand  2. Difficult to understand

1. Very difficult to understand

7) MEND resources (kit and manuals)

4. Very easy to understand  3. Easy to understand  2. Difficult to understand

1. Very difficult to understand

8) MEND program philosophy (the 4Cs)

4. Very easy to understand  3. Easy to understand  2. Difficult to understand

1. Very difficult to understand

9) Nutrition

4. Very easy to understand  3. Easy to understand  2. Difficult to understand

1. Very difficult to understand

10) Parent workshops component

4. Very easy to understand  3. Easy to understand  2. Difficult to understand

1. Very difficult to understand

11) Healthy Families component

4. Very easy to understand  3. Easy to understand  2. Difficult to understand

1. Very difficult to understand

12) Active play component

4. Very easy to understand  3. Easy to understand  2. Difficult to understand   
1. Very difficult to understand

13) Power time component

4. Very easy to understand  3. Easy to understand  2. Difficult to understand   
1. Very difficult to understand

14) Family expectations, routines and tantrums

4. Very easy to understand  3. Easy to understand  2. Difficult to understand   
1. Very difficult to understand

15) Working with groups

4. Very easy to understand  3. Easy to understand  2. Difficult to understand   
1. Very difficult to understand

16) Healthy Growth Checks

4. Very easy to understand  3. Easy to understand  2. Difficult to understand   
1. Very difficult to understand

17) Any other comments?

18) Do you feel equipped to run your MEND program?

19) What will your role be at MEND?

20) Do you have any additional comments on the training?